Practising Knowing in Emergency Departments

Tracing the disciplinary and institutional complexities
of working, learning and knowing
in modern emergency departments

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Certificate Of Authorship/Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Candidate

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Acknowledgements

'Knowledge is not something people possess in their heads, but rather something that people do together' (Gergen 1985, p. 270).

So it is with this thesis. While I have worked the solitary hours, the knowledge of this work has been and remains a collective effort. The activities and contributions of my supervisors, Professor Hermine Scheeres and Professor Rick Iedema, involving many hours of reading, talking, refining and clarifying ideas, are incalculable. I would like to express my gratitude to them sincerely and put on record how fortunate I feel to have worked with such interested and fine minds. Their supervisory practices portray the scholarship and professionalism of the Academy as it should be enacted.

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Abbreviations, acronyms and technical symbols

ACEM   Australasian College for Emergency Medicine

Ambos   Ambulance Officers

ARC   Australian Research Council

BP   Blood pressure

CA   Cancer (determined by the context)

CA   Conversation Analysis (determined by the context)

CNN   Cable News Network

CT   Computered Tomography

D1, N2, P   abbreviations referring to clinicians and patients in the talk

ECG   Electrocardiogram

ED   Emergency Department

EDIS   Electronic Data Information System

Fast Track   Special house doctor facility in some emergency departments

in actu   in the actual event

in situ   in the place

in vacuo   in isolation from a real context

LE   Linguistic Ethnography

KM   Knowledge Management

MET   Medical Emergency Team

'mets'   metastasis

NSW   New South Wales

'obs'   observations

'pat' slide   patient slide

post hoc   after this, afterwards

RCT	Random Control Trials
'resusc'	resuscitation (the room or the process)
'sats'	Saturation readings
SFL	Systemic Functional Linguistics

Non-standard words

idio-adaptive	responding and adapting individually
idiocentric	centred on individual tasks and actions
diasomatic	body to body

Transcription symbols

(Adapted from O'Grady 2011, p. 71, based originally on Sacks, Schegloff, & Jefferson 1974:731)

[	A single square bracket indicates the point at which a current speaker's utterance is overlapped by the talk of another
((double brackets))	explanation of text, body movement or the colour coding of the transcripts
(an) underlined word(s)	means the word is stressed which signals that the word is important in the statement
(words in single brackets)	my best guess as to what was said
…	indicates an unfinished sentence
(..)	indicates that the words or phrases are not clear or audible

Abstract

In this thesis I examine 'knowing in practice' (Gherardi 2006) in emergency departments (EDs) and present a new conceptualisation of how knowing in practice is done. In particular, I examine how nurses and doctors draw on recognised disciplinary practices and adapt these in the institutional setting of the ED to reconstitute what they need to know to enact safe practice. I situate their practices in a meta-disciplinary and institutional practice framework, as collective enactments of ED work that are proximal, prefigured participatory, pre-emptive, and protocol or rule-governed.

Through analyses of the study's ethnographic and linguistic ethnographic data, collected in five Australian EDs over four years, I explore how nurses and doctors work, learn and know in the ED. Drawing on practice theorisations of organisational work (Gherardi 2008; Orlikowski 2002; Schatzki 2001a; Yamauchi 2006), I examine how their working, learning and knowing in practice respond to disciplinary and institutional structurings of care that afford particular opportunities for action. In doing this, 'prominence and explanatory power' are given to 'materiality, spaces, time, the body, affectivity, interests, and preoccupations [in the ED]' (Nicolini 2011, p. 617).

Findings show that as nurses and doctors interact with patients, others, the material arrangements of the ED and its objects, they engage in collective and individual activities and actions to resource, reconstitute and (re)produce ED knowledge. Knowledge is proposed as knowing: it is situated, embodied, teleological and relational, enacted in the activity of everyday practice(s). This view challenges the way knowledge is conventionally understood in healthcare, i.e. as an 'epistemology of possession' (Cook & Brown 1999, p. 383; Nicolini *et al.* 2008).

A focus on knowing rather than cognitive understandings of knowledge, shifts attention *away* from nurses and doctors as individual knowers/doers/communicators, *towards* a systemic, institutional and disciplinary framing: one that underpins the extra-individuality (Kemmis 2009) and teleological aspects of nurses' and doctors' professional practices (Schatzki 2009) and how these are enacted in the organisational setting of the ED.

The thesis findings contribute to a deeper understanding of the complexity of knowing in practice in the ED and reframe conventional approaches to addressing teamwork, interprofessional communication and the current model of care in EDs.

Chapter One – Introducing the study

Purpose and flow of this chapter

In Chapter One I introduce the focus of the thesis, which is how nurses and doctors know in practice in Emergency Departments (EDs). Then I present the central concerns of the study, the research questions, background to the study, the research sites and participants: EDs, hospital workers and the patients whose consultations I examine in detail.

I introduce the context in which I examine nurses' and doctors' practices in ED care including increasing patient numbers and increasing critical incidents, including one patient's death. I outline the central concerns of the research, namely, divergent understandings of knowledge and how work is organised around these understandings. I examine the way knowledge is understood and institutionalised in healthcare broadly (Nicolini *et al.* 2008), and specifically in the ED. I briefly discuss how these understandings implicate approaches to managing knowledge and addressing individual and team-based practice in ED care.

I conclude with an outline of each chapter.

1.1.   Introduction

This doctoral research presents an elaborated and integrated view of ED work and examines how nurses and doctors know in practice. Their doings, sayings, seeings and beings (what Kemmis refers to as 'relatings' 2009, p. 23) in the ED can be methodologically (empirically) understood as how they know in practice. The study's approach goes beyond some of the more commonly and currently understood ways of investigating individual practitioners and their role in practice-related problems in health service delivery. Existing research has conventionally focused on improving practices in interprofessional communication and teamwork, seen as solutions to (patient and situational, i.e. patient status) information transfer problems in healthcare. In the thesis I identify this existing research as worthwhile, but insufficient to address and understand the burgeoning complexity of ED work. Instead, I propose more recent organisational approaches to understanding the relationship between knowledge and work: approaches that consider how knowing is done in complex ways, through actions in everyday work, as

workers draw on disciplinary, site-specific and their own knowledges (Gherardi 2008) in institutional settings.

The narrative of the thesis places what doctors and nurses do, know and say – their practices – at the centre, and situates these practices in a wider context of historical, disciplinary and institutional working and knowing in practice. Practices are conceptualised as prefigured and prevailing ways of doing, saying and being, underpinned by knowledges, teleologies, rules and protocols (Schatzki 2006). These in turn are perpetuated by social and institutional arrangements, and in the case of the organisation of work in the ED, these practices are connected to and reflect the broader nexuses of medicine and nursing paradigms. Practice is examined as a teleological, multiplicitous undertaking, which shifts the focus of knowing from individuals as knowers/doers to what they do and say as carriers of their practice(s). From a practice theory point of view this means that 'materiality, spaces, time, the body, affectivity, interests, and preoccupations are given prominence and explanatory power' (Nicolini 2011, p. 617) in understanding how nurses and doctors have learned to work and know in the organisational setting of the ED.

The thesis explores what it means to shift from a stance in which doctors and nurses communicate and share (so-called fixed) knowledge to one in which doctors and nurses continually reconstruct their knowing in ED work. To do this, I draw on practice theory and linguistic ethnography (LE) analyses of empirical data, and present three lenses on this data:

- I examine how nurses and doctors work in the ED. This includes a macro analysis of work practices in the ED consultation set up by its stages and staffing, followed by a micro analysis of work practices at the bedside of two case study patients. This lens explores the 'organizational memory' as the sum of nurses' and doctors' 'practice memories' (Schatzki 2006, p. 1870), illustrating how ED knowledge is (re)produced in the ED.

- I examine nurses and doctors' professional formation prior to and then in the ED. This lens explores how learning is steeped in disciplinary and institutional practices, and is an individual, collective, emergent and teleoaffective phenomenon. This lens explores learning and its relationship to knowing in the ED, identifying (teamwork and information transfer) practices as extra-individual (Kemmis 2009) and complex.

- Finally, I examine how nurses' and doctors' knowing is enacted in iterative, non-linear, disconnected and 'mangled' (Pickering 1993) ways. This lens explores what this means for individual and team knowledge and knowing as care happens. I identify that in the 'timespace' (Schatzki 2009, 2010b) of the ED, not knowing is a prominent feature of ED work because of the uncertainty and complexity of medical work, the space and time over which consultations take place and, in a part, the inexperience of junior doctors. This lens situates team (and individual) communication and knowing in complex paradigm of practice.

The findings from these analytical lenses are brought together in a meta-disciplinary and institutional framework through which I explore how nurses and doctors know in practice as they care for patients. This framework provides a new way of understanding work in the ED by identifying what nurses and doctors do and say to manage the indeterminacy of work in this setting. I propose they draw on a number of key shared or common healthcare practices. These practices, extant in other contexts of medical practice, such as prototypical GP consultations, occur in particular ways in the ED. Here, they are enacted in exaggerated and recursive patterns – to suit the different configurations of space, knowledge, time and objects – and divided disciplinary exigencies in the ED. While several of these elements may be present even in the prototypical GP consultation, they are not quite as instrumentally and immediately consequential there as they are in the ED consultation.

The framework shifts an understanding of the ED as a setting that is premised on (fixed and usually medical) knowledge as an authoritative construct to one in which knowing is the presiding construct. The former perpetuates ways of working, discourses and vested interests of medicine over socially- and materially-embedded knowing, enacted through collective *in situ* practising.

1.2.   The central concerns of the research

Knowledge and its relationship to practice have been, and are still, conceptualised in work settings in very different ways. These different conceptualisations can be traced historically and each emphasises different organisational approaches to understanding and addressing knowledge in various work and sector contexts.

Firstly, an interest in knowledge as an organisational resource was initially articulated as workplaces moved from manufacturing to more technological and innovative forms of

production in the middle of the 20th century, when Drucker (1959) first identified workers as 'knowledge workers'. In this paradigm of work, an organisation's competitive, innovative and sustainable edge increasingly came from what workers knew rather than from what workers did or made. Over time, as organisational theorists researched companies and institutions the obvious links between managing knowledge, transferring knowledge and producing knowledge in a company focused attention on how individual workers, and then the organisation itself, learned (Lave & Wenger 1991) as it strove to gain competitive and innovative advantage over its competitors.

As organisations and organisational theorists began to realise that knowledge was a very significant resource in organisations and in society in general, it led to a view that 'organizational learning' as a process 'could be managed like any other organizational process' (Gherardi 2009, p. 353). However, theorists struggled with the notion of working with knowledge as an object. This meant that using the traditional categories of organizational analysis, 'knowledge', understood as a resource, proved difficult to grasp when and if it was theorised as an 'epistemology of possession' (Cook & Brown 1999, p. 383). Instead, when organisational theorists began thinking in terms of knowing rather than knowledge which followed the conceptual shift of seeing organisations as organising (e.g. Clegg & Hardy 1996, p. 4) it led to 'knowledge' (which induced its conceptualization in terms of 'object') being replaced with 'knowing', that is, an activity and process which unfolds over time' (Blacker 1995 in Gherardi 2009, p. 353). Knowledge could now be defined as an activity, 'a collective and distributed 'doing' [ ] situated in time and space, and therefore [ ] taking place in work practices' (Gherardi 2009, p. 353). Gherardi identified this new understanding as a turning point for those investigating learning and knowing in organisations. For her, this heralded 'the practice turn in this area of social studies, anticipating the celebrated book by Schatzki *et al.* (2001)' (Gherardi 2009, p. 353) which has since led to a focus on work practices, knowing and organising.

Medical knowledge is still largely viewed by the health sector as an 'epistemology of possession' (Cook & Brown 1999, p. 383), valued hierarchically by its different sector participants, rather than as a situated, emergent and collective doing (Nicolini *et al.* 2008). ED managers and other health managers continue to focus on improving the institutional management of codified patient knowledge. These attempts to improve the institutional management of knowledge as nurses and doctors work, include efforts aimed at improving,

for example, individual communication and teamwork skills and focusing on streamlining institutional and technological information-transfer systems, such as handover protocols and electronic patient record keeping systems. These interventions are all aimed at ensuring more frequent, reliable and secure information transfer, capturing fixed knowledge about patients and processes. On the one hand, they address individual skills; on the other hand, they propose that knowledge is capable of being captured securely.

While these efforts are essential to safety and quality of care, they both perpetuate an understanding of knowledge as a cognitive, fixed or stable entity (*I will have the same understanding of this as everyone else; this information will never get lost)*. Even though healthcare has an understanding of the *process* of knowing, knowing is still largely viewed as instrumental and largely neutral, only partially encumbered by relational and situational aspects of work. In this paradigm, relational and information shortfalls can be addressed through care redesign or training. Conventionally therefore in healthcare, individual nurses and doctors (and even the teams they work in, as entities) are understood to possess, and therefore able to transfer – after attending to communication skills training such as effective listening etc., or recording patient information electronically – details of the patient's care and/or medical evidence, among themselves in straightforward ways. In this paradigm, improved handover protocols, electronic record keeping and better teamwork and communication will lead to a secure and expeditious capture/transfer of fixed (and evidentiary) knowledge of the patient and his or her care.

I propose that work in the ED – i.e. the way that emergency health knowledge is (re)produced) – should be more broadly understood as a site of knowing rather than one that is focused on possessing hierarchical *in vacuo* knowledge. On the basis of the findings of this study, I contend that nurses and doctors are not working (in stable processes of knowing) with fixed, stable forms of knowledge that can be (if one tries hard, is trained etc.) unproblematically transferred or communicated in time. I challenge therefore the concomitant training, policy and research efforts, including handover and teamwork initiatives and policy statements, that have centred predominantly on developing the capabilities and skillsets of individual practitioners and/or teams to transfer and manage so-called fixed, stable forms of knowledge, and knowledge transfer processes, more effectively (see, for example, Cohen & Hilligoss 2010; Cooper *et al.* 2007; Kilner & Sheppard 2009; Singer & Dean 2006; Talbot & Bleetman 2007; World Health Organization

2010). These approaches and their pedagogic equivalents encourage autonomy, self-directed learning and self-assessment (Bleakley 2006), paying little attention to the social and material arrangements of working and learning and how these implicate knowing and communicating. In the complexity of ED work these endeavours, while worthwhile, are inadequate.

Research questions

Taking as a starting point the predominant literature on teamwork and communication in EDs and healthcare in general, my initial research questions centred on how a team of health professionals (in EDs) might co-construct and share knowledge, or communicate between themselves, about a patient and about their work in the ED. The focus of data collection and analysis would take place at the bedside. As I shifted to understanding knowledge less as an 'epistemology of possession' (Cook & Brown 1999, p. 383) and more as a process enacted and (re)produced through work practices (Gherardi 2006, 2009; Schatzki 2005, 2006) – with nurses and doctors as carriers of disciplinary and institutional practices (Reckwitz 2002) – the research questions developed over time into two enquiries:

1.   What are the institutional and disciplinary complexities of working, learning and knowing in modern emergency departments?
2.   How do doctors and nurses know in practice?

The questions reflect a shift in the way I came to understand the relationship between knowledge and practice, prior to and throughout the study. As such I deal with these two questions in an integrated way through the data chapters and the discussion.

Finding the research focus

I became interested in how nurses' and doctors' practices, and their specialised knowledges, are conceptualised, learned, institutionalised and enacted in their work practices and the work practices of the ED through a number of professional and vocational avenues. Drawing on a professional background in organisational and team learning, communication training, discourse analysis and adult education work and teaching across a number of

industries, I joined a pilot study researching clinician-patient communication in one large metropolitan hospital ED in late 2006.[1]

At this hospital I carried out a number of interviews and patient consultation audio-recordings. Following this, I was engaged to manage the pilot study's larger successor project[2] (see Appendix 1 for further details), from 2007 – 2010, working with a team of seven academics from two universities. The focus of this research was on identifying effective clinician-patient communication in EDs, a focus different from the work presented in this doctoral research.

Between completing the pilot study and the larger project, I enrolled in my PhD at the beginning of 2008. In this time, I learned a great deal about EDs, particularly how they had progressively established themselves as sites of specialised (professional) knowledge and developed from a street rescue service (see below) to being a sophisticated and specialised health service. I became interested in how the specialised knowledge of the ED had become an important organisational asset for the ED, leading to the growth of emergency medicine as a body of specialised professional activity in the wider medical profession and in the healthcare domain. This specialised knowledge and the services of the ED today provide one of the core training opportunities for junior medical interns as part of the tertiary training system. This training opportunity is one of the services provided by EDs and fits within a larger and specific charter of operation (outlined in greater detail below in section 1.4).

As I became engaged in the ethnographic work and audio-recording of the ED consultations in the pilot and ARC projects, the role and power of disciplinary knowledge, its perceived integrity as a stable, codifiable entity, was of growing interest to me. This, and the fact that disciplinary knowledge appeared to be at the heart of the relationship between nurses and doctors (and patients) I thought were central to work and learning in the ED. It was clear that nurses and doctors were, in a sense, interested in different things: they did not share each others' disciplinary knowledges and while they shared some ways of working with patients, their practices were drawing on different paradigms.

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[1] The pilot project was funded by a Partnership Grant through The University of Technology, Sydney and the hospital research site (the ED in St Geremias Hospital).
[2] An Australian Research Council (ARC) Linkage project, LP0775435, Emergency Communication: Addressing the challenges in health care discourses and practices

Increasingly I found that the focus of the ARC project (and other) research on individual practitioners' communicative and teamwork skills and dispositions as key to ensuring safety and quality, glossed over the role that the institutional and disciplinary arrangements might have on the safety and quality of care. I thought that space, the ED layout, the different disciplinary tasks and knowledges, language and objects (including the magnitude of patient and care details) might also impact on safety and quality, not just the individual to individual or individual to group transfer of information about patients. Because my observations revealed *in situ* negotiation of details to be critical to nurses and doctors developing their knowing, I also wanted to focus on how such knowing was emergent and situated, i.e. done *in situ*.

I began to search for a more complex view of the layers involved in communicating and transferring knowledge between workers in the ED, seeking to show that knowledge transfer and knowing could not be characterised as straightforward accomplishments (Orlikowski 2002; Savolainen 2009). Drawing on the project and further data, and exploring practice theory (Gherardi 2006, 2009; Nicolini 2011; Nicolini *et al.* 2008; Schatzki 2001a, 2005, 2006, 2009), I began to understand that knowledge could be understood as a collective doing and was not merely a stable entity possessed by individuals.

I shifted my focus away from nurses and doctors as individual knowers and doers, towards a systemic, institutional and disciplinary framing. In this latter paradigm, knowledge and work could be seen as integrated phenomena, involving people (embodied and knowing), their actions (doings), their language (sayings), their multiple knowledge(s), their teleologies (including beings), the ED space, its objects and things, and uncertain pathologies of deteriorating patients. This approach would privilege the practices of work, not what nurses and doctors communicated in teams or otherwise.

My interest in practice as the site of knowing rather than on knowledge as possession *in practice*, gradually informed my final research questions, outlined above. These questions seek to take into account the relational, social, material, emergent, teleological and linguistic understandings of work that go beyond those focusing on fixed knowledge. My questions also seek to take into account the ED as a site of not knowing (Yamauchi 2006), even though EDs are generally understood as places of expert knowing.

1.3. Background to the study

The public health system and the health professionals who work in hospitals and community settings (National Health and Hospitals Reform Commission 2009) have been, and continue to be, under ever-increasing pressure to deliver safer and more efficient services. It is well documented that most EDs in Australia had been under pressure to meet growing numbers of patient presentations, which they were expected to manage with increasingly limited time and shrinking staffing resources (Australasian College of Emergency Medicine 1993; Forero & Hillman 2008; Robotham 1 December 2008; Robotham 18 June 2010 (The Sydney Morning Herald)).

This is part of a growing trend, nationally and internationally, where health systems are being confronted with a number of challenges, including:

- the ageing of most western populations
- increasing numbers of people with chronic health conditions
- rising community and political expectations of health services
- a global shortage of skilled health workers
- increasing numbers of people presenting with mental health and complex psycho-social problems; and
- advances in medical technologies generating increased expectations and requiring high levels of resourcing.

The pressures ED clinicians are experiencing was highlighted in the landmark report of a Special Commission of Inquiry into Acute Care Services in NSW Public Hospitals whose findings were published in what is known as 'The Garling Report' (Garling 2008). This Inquiry was set up just prior to the study period, following the death of a young teenage woman in a metropolitan ED in November 2005. This accident and other

> highly publicised incidents […] cast doubt in the public mind on how safe [NSW] public hospitals were and whether the quality of care they provided was what patients and their families and friends were entitled to expect (Garling 2008, p. 1).

This is despite the fact that Australia's healthcare outcomes are in the top 10% of OECD (Organisation for Economic Co-operation and Development) countries, i.e. developed economies (article by Keane in Crikey, 25 November 2010).

The Garling Report situated its findings in a sector of significant proportion and complexity. For example, Garling identified that:

> NSW Health will experience on a typical day:
>
> - an ambulance responding to an emergency 000 call every 30 seconds
>
> - 6,000 patients arriving at Emergency Departments seeking treatment
>
> - 4,900 new people being admitted as an in-patient at a hospital
>
> - 17,000 people occupying a hospital bed of whom 7,480 are over 65 years old
>
> - 7,000 separate procedures performed, and
>
> - $34 million spent on providing care in public hospitals and for the health of the people of NSW (Garling 2008, p. 1).

If safety and standards in the NSW public health system were to be improved, The Garling Report recommended that a number of principles should be reflected in the work of four new key bodies, that he identified as the 'four pillars of reform of the public hospital system' (Garling 2008, p. 5):

1. The Clinical Innovation and Enhancement Agency
2. The Clinical Excellence Commission
3. The Institute of Clinical Education and Training and
4. The Bureau of Health Information.

In order to improve safety in healthcare and minimise the occurrence of critical incidents – that is, adverse events leading to avoidable patient harm – Garling indicated that the redesign of clinical practices by these agencies must be:

> 1) a bottom-up reform driven by clinicians
>
> 2) that *information about the safety and quality of treatment at the unit level* is the greatest guarantee of a quick change-over to evidence based best practice models of care
>
> 3) that the only way to avoid a slide of the present clinical standards into mediocrity or worse is by strengthening the training of new clinicians in *better, safer treatments* based on a *patient centred team approach*
>
> 4) that the safety and quality of public hospital care should be the highest priority of the public hospital system, and that its employees need to implement this *at the individual patient level* (Garling 2008, p. 5, italics added).

The italicised words and phrases listed above suggested that changes to practices – even micro practices ('at the unit level' and 'at the individual patient level' (Garling 2008, p. 5)) by doctors, nurses and clinical teams must be achieved if NSW health systems were to maintain safety and high standards of care.

Garling also advocated practice changes for the management of scientific knowledge about patients ('information about the safety and quality of treatment'; 'better, safer treatments' (Garling 2008, p. 5)); and knowledge about how care was organised. These, he indicated, might best work through 'strengthening the training of new clinicians in evidence based [sic] best practice models of care' (Garling 2008, p. 5). These points suggest that what doctors and nurses do, know and say at the level of direct care to patients, and the way that the hospital manages the knowledge involved in care, are seen as central to safety and also to improvements in the system. The expert role of EDs and the expert knowledge of its practitioners were particularly singled out for investigation, and communication was identified as a key factor in the young woman's death mentioned above. Although EDs had been seen as places of specialised medical expertise, The Garling Report did identify that there were problems in the way that acute care services in general, and emergency care services in particular, were being conducted. The ongoing expectation was that patients would be safely cared for in this setting, yet critical incidents and deaths were (and are) still occurring and even increasing (Gross 4 July, 2012, The Australian Financial Review).

However, despite this report, emergency health practitioners in EDs, as gatekeepers of entry into the public hospital system in particular, continue to find their clinical practices increasingly compromised as they are expected to deliver better patient-centred care yet simultaneously meet growing organisational and financial efficiency imperatives (Gross 4 July, 2012, The Australian Financial Review).

1.4.   The research participants

Introducing the EDs

The research sites are five EDs in New South Wales (NSW), Australia. An ED is an organised health facility that has evolved exponentially over the past sixty years. At its inception it was a two-bed facility at Newcastle Johns Hopkins Hospital in the USA, where a police patrol wagon transported patients, as ambulance services were not yet widely available. In the 1950s the specialisation of emergency medicine was set up through the

'Emergency Squad Doctor Plan' at that hospital. A physician on call could be taken to the scene of an accident to administer on-the-spot treatment. The Australian equivalent of an ED came later, with the first facility established in Geelong, a small rural city in Victoria, in 1967.

EDs are now an integral part of the wider, modern health system in Australia and are set up to operate within a specifically constructed facility at selected hospitals, based on the demographic factor of population density. Many EDs in city locations are tertiary referral hospitals,[3] and are seen and used as training grounds for junior doctors. Today they are complex working and institutional environments with multiple purposes. For example, each ED integrates a number of activities and organisational structures in its charter of service, and the complexity of work here involves a number of 'narrative and technical rationalities' (Eisenberg *et al.* 2005; Nugus 2007). Core services include acute medical assessment and treatment services involving multidisciplinary healthcare practices and extend to tertiary training and referral sites with services linked to community health facilities.

The five EDs that took part in this study range from major urban to semi-rural facilities, with a variety of care options and facilities as outlined in Table 1:

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[3] Hospitals linked to universities and therefore to training doctors, nurses and other allied health workers

	St Williams Hospital[4] (large urban ED)	Healthy Hospital (semi-rural ED)	Greater Beach Hospital (semi-rural ED)	St Crispin's Hospital (large urban ED)	St Geremias Hospital (large urban ED)[5]
Number of presentations annually	44,791 (NSW Department of Health 2009)	29,908 (NSW Department of Health 2009)	49,916 (NSW Department of Health 2009)	56,198 (Hospital data)	59,017 (Hospital data)
Care options	Acute and sub-acute care; three resuscitation beds; integrated mental health facility (PECC); stayover beds (EMU)	Acute and sub-acute care; GP-like facility; two resuscitation beds; separated mental health facility; not a trauma hospital	Acute and sub-acute care; GP-like facility; three resuscitation beds; trauma hospital; mental health facility	Acute; sub-acute; GP-like service; three resuscitation beds; advanced practice nurses; stay over facility (EMU); mental health facility	Acute and sub-acute care; GP-like facility; three resuscitation beds; mental health facility; a trauma hospital
Patients seen per day in time of the study	120 per day on average	81 per day on average	137.6 per day on average	151 per day on average	134 per day on average in 2006 160 per day on average in 2009 (19% increase)
Triage Category[6] as % of present-ations (in 2008/9)	Cat 1 1.2% Cat 2 6.9% Cat 3 40.2% Cat 4 42.0% Cat 5 9.6%	Cat 1 0.3% Cat 2 7.7% Cat 3 23.1% Cat 4 47.9% Cat 5 20.9%	Cat 1 0.4% Cat 2 8.9% Cat 3 30.6% Cat 4 50.3% Cat 5 9.8%	Cat 1 0.6%[7] Cat 2 13.4% Cat 3 34.8% Cat 4 42.4% Cat 5 8.8%	Cat 1 1.5% Cat 2 11.8% Cat 3 37.9% Cat 4 43.8% Cat 5 5.0%

Table 1: Overview of hospitals in this study

Introducing the research participants

In introducing the research participants, it is worth pointing out that there are many healthcare workers who work regularly in EDs on a part-time or full-time basis. These include social workers, physiotherapists, diabetes educators, dietitians, occupational therapists, pharmacists, radiographers and radiation scientists, sonographers and so on. I address the work practices of nurses and doctors in this study although on occasion I refer to the involvement of other healthcare practitioners. In many instances I talk about nurses and doctors as composites – what they do and say is distilled into the essence of what many clinicians I observed, did, or said, and/or how they related. By focusing on what was common or universal, I describe them as one. 'In this [ ] they are fused into 'the doctor'' (Mol 2008, p. 2) or 'the nurse' who talks to, treats and cares for their patients. As Mol says,

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[4] These are pseudonyms for the hospitals researched.

[5] The research team visited this hospital in 2006 and again in 2009. The 19% increase in presentations to St Geremias' ED from 2006 to 2009 reflects the continuing growth of the need for services provided by EDs as well as the increasing demands on healthcare services in general.

[6] Triage Category as determined by the ACEM (Australasian College of Emergency Medicine 1993), the professional body that oversees the standards and delivery of emergency healthcare in Australia and New Zealand.

[7] Hospital figures

by 'mobilising events and examples,' the analyses and discussions that follow allow me to 'gradually flesh out' (Mol 2008, p. 2) nurses' and doctors' practices, by abstracting the 'extra-individuality' (Kemmis 2009, p. 22) of *all* nurses' and doctors' practices.

The doctors

In the ED, in the medical professional stream, the hierarchy of expertise ranges from student doctors (not qualified yet), interns (graduate doctors, called junior doctors in this thesis, those doing a rotation in the ED as a part of their experience training), residents (holding post-graduate training and extending their skills in specific areas), junior registrars (those who are in the first three years of the specialty of emergency medicine after graduating as doctors), senior registrars (those who are in the latter years of emergency medicine after completing a full medical degree, followed by initial emergency medicine training), to staff specialists (fully qualified senior registrars with considerable experience). Even in these categories of formation, individual clinicians will be at a level of novice to expert practitioner. These individual doctors have access to specialist registrars who are not part of the ED staff but can be consulted from within the ED. Specialist registrars, for example gastroenterology registrars, accept patients after disposition from EDs into their wards. Emergency Medicine, as outlined above, has become a specialised profession, requiring significant study and *in situ* training by practitioners who seek to specialise in emergency medicine, but EDs also provide a training ground for all junior doctors. I elaborate on the learning and teaching role of EDs in Chapter Five.

The two doctors who are central to my case studies are both junior doctors. This means they are in their first year of internship in their respective EDs. They are both overseas trained.

The nurses

In the nursing stream most nurses are staff nurses (or agency nurses, hired on a sessional basis) who work in a number of roles or specialisation areas, e.g. triage, nurse education, aged care or mental health. Nursing qualifications range from assistants in nursing (AINs), enrolled nurses (ENs), endorsed enrolled nurses (EENs), registered nurses (RNs), and in some cases, nurse practitioners (NPs). These are vertical qualifications, involving longer periods of study. Once nurses have graduated as Registered Nurses (RNs), in these broader categories there are additional roles involving expertise and experience, some of which

align to particular job titles or roles. These include in-charge nurses, triage nurses, clinical nurse specialists, clinical nurse consultants, clinical development nurses, registered nurse levels 1 – 4, clinical nurse educators, directors of nursing, assistant directors of nursing (emergency), nursing unit managers, and mental health nurses.

Unlike medicine, there is no specialty nursing qualification in emergency nursing even though senior staff nurses over time will become highly skilled and expert specialists in their own right in ED-specific practice. In each ED there is also usually a nurse educator responsible for setting up and maintaining a mentoring and/or educational system for nurses. Although the learning and practising framework for nursing is far less structured than that of the medical staff in the ED, it is still hierarchically organised.

The nurses I examine in my two case studies range from those who are very junior to those who are senior in-charge nurses.

The patients

The full list of patients whose consultations were audio-recorded for the pilot and larger study that have informed this thesis are outlined in Appendix 2. I focus on the consultations of two patients in detail, although I do draw on other patient data from time to time. In the methodology and data analysis chapters I outline the justification for selecting these two patients, Jane Edna and Joel, as case studies.

Jane Edna is a 95-year old hostel patient who rings an ambulance herself one morning to bring her to the ED. Jane Edna, who is almost blind, presents with unclear and vague symptoms of lower epigastric pain having earlier reported experiencing chest pain, which the ephemeral team (Hindmarsh & Pilnick 2007) – that is, the short-lived group of individuals who care for her – works to diagnose and treat throughout what becomes for Jane Edna a very long and traumatic day. I spend approximately ten hours with Jane Edna at her bedside.

Joel is a 65-year old male patient who is brought to the ED by ambulance one day because he is suffering from increased pain in his leg. He has had a rod put in his leg and has been on crutches quite ably until recently when he stood up and felt a crack in his leg. Joel can no longer walk because of this increased pain, but feels fine if he does not move. Joel is in palliative care because of cancer originating from his kidneys that has spread to his leg. I spend over four hours with Joel.

1.5.   Outline of the thesis

In Chapter One, I set the scene for the research exegesis. I locate the study, outline the central concerns of the research, the research questions, background to the study, research sites and research participants. The chapter introduces the patients I examine in detail, and concludes with an outline of the rest of the thesis.

In Chapter Two, I locate the study theoretically against a background of research on communication and teamwork in healthcare (and in EDs), addressing conventional understandings of, and approaches to, knowledge in, and related to, healthcare practice. I propose that this literature situates nurses' and doctors' teamwork and communication capabilities in a predominantly individualistic and instrumental paradigm of conscious and intentional work, based on a particular view of knowledge. Given current demographic and efficiency pressures on EDs, understanding ED work from these perspectives is insufficient and inadequate.

I then introduce practice theory and practice theory conceptualisations of knowledge, understood as knowing, as a valuable analytical lens to better understand ED work. I define key terms such as knowledge, information, knowing, organisations, institutions and timespace, explaining how I understand and use these terms. I then outline my understanding of practices, identifying the units of analysis I draw on for my data.

Finally I draw on some of the conventional reading on healthcare communication literature to acknowledge insights derived from this body of work.

I conclude that a practice theory approach locates ED work in a complex, historical framework of medical and nursing practice and shifts the focus away from individual communication, teamwork and/or knowledge management capabilities to nurses' and doctors' practices.

In Chapter Three I situate the research within an epistemology of constructivist/ interpretivist traditions of social research, outlining how practice theory fits within this tradition. I substantiate the methodological approaches used, including quasi ethnography and linguistic ethnography (LE), as suitable for examining practice(s).

I present the research design, focusing on a full ED consultation as the basis for investigating practice. I outline the methods for collecting data including audio-recording

consultations, (interviews) and non-participant observation of ED work. I justify the selection of two case study patients whose consultations I analyse, drawing on the audio-recorded transcripts and field notes from which I develop knowledge networks and a practice/LE matrix of the consultation. These are innovative analytical tools, facilitating an understanding of practising and knowing as networked, activity-based and situated undertakings.

I conclude with a brief overview of the study's ethics and a discussion on methodological limitations of the research approach.

In Chapter Four I introduce Jane Edna and Joel, the two case study patients. Based on the data analysis tools I introduce in Chapter Three, I examine, from a macro perspective, how nurses and doctors enact disciplinary activities and actions which are organised by the ED's staged, linear model of care – the ED's 'organizational memory' (Schatzki 2006, p. 1870). I also examine from a micro perspective how nurses' and doctors' individual and disciplinary practices at patients' bedsides draw on complex and 'textured' (Cooper & Fox 1990; Gherardi 2006) doings, sayings and beings in their environments.

I examine how the organisation of the ED reflects the way knowledge is (re)produced there: who is involved; what their roles and statuses are; what material arrangements are in place. In each ED consultation this involves multiple clinicians, patients, technologies, objects, interactions, space and time, rendering knowledge and knowing as 'fragmented' (Bruni, Gherardi & Parolin 2007).

I then consider how knowledge and knowing are conceptualised in the current staged model of the ED consultation, premised on the intended linear transfer of patient and situational details. I explore what happens in practice, illustrating that knowledge is not necessarily fixed or linear but that knowing (although not linear) is (re)produced through praxis in which multiple practitioners, objects, language, space and time combine in regular actions and activities that make up the practices of the ED.

I conclude that nurses' and doctors' work is defined by practice regularity that is disciplinary and institutional.

In Chapter Five I connect working practices examined in Chapter Four to learning. I outline the professional formation of nurses and doctors prior to working in the ED, followed by an analysis of some the ED's pedagogic functions as understood by the

disciplines of medicine and nursing and the health system. I examine learning opportunities (implicit and explicit) afforded by the institutional and disciplinary arrangements of care.

I present selected disciplinary activities and actions in Jane Edna's and Joel's consultations, drawing on practice theory understandings of how practices are learned as nurses and doctors participate in them. I show that as opportunities for learning arise from each other, these are often missed as doctors and nurses remain attached to their practice knowledges and contest each other's legitimacy as knowers and the legitimacy of patients as knowers.

I conclude that attachments to practice knowledges render learning as emergent and past and future-oriented, a tension central to understanding practices as collective, extra-situational and extra-individual (Kemmis 2009). As nurses and doctors learn institutional and disciplinary practices in the timespace of the ED, this presents a complex picture of ED work, situating working and learning in a relational and epistemological paradigm of work. Even though nurses and doctors (and patients) communicate with each other at appropriate times and places, learning across disciplinary and patient/doctor boundaries and transferring patient details across these boundaries remains problematic.

In Chapter Six I explore the unfolding of the performances of nurses' and doctors' activities and actions in the ED. I trace how nurses' and doctors' knowing is enacted in iterative, non-linear, disconnected and 'mangled' (Pickering 1993) ways, and involves not knowing. I explore what this means for individual and teamwork and knowing as care happens.

I identify that in the timespace of the ED, not knowing is a prominent feature of ED work because of the uncertainty and complexity of medical work, the space and time over which consultations take place and, in part, the inexperience of junior doctors.

I then examine knowing/not knowing as a contingent space, showing how nurses and doctors value patient details in idiosyncratic ways, understand items differently, misplace or forget (Talbot & Bleetman 2007) them, and need to negotiate and/or alter them in practising. I examine these findings in the light of the ED's model of care, premised on healthcare's view of knowledge (Nicolini *et al.* 2008).

I illustrate how nurses and doctors (learn to) work with things unknown through activity: knowing is an ongoing accomplishment – 'constituted and reconstituted every day [and in every action] in practice' (Orlikowski 2002, p. 269).

I conclude Chapter Six by situating team (and individual) communication and knowing in a complex paradigm of practice. I identify that ED work is precarious and propose that the complexity of work will increasingly challenge the safety of patients and the ability for nurses and doctors to cope in this system.

In Chapter Seven, based on the precariousness and complexity of ED work, I explore a meta-disciplinary and institutional framework of ED practices, dimensions of which, I propose nurses and doctors draw on to enact safe care. I categorise their doings, sayings and beings in ED work heuristically as 1) proximal; 2) prefigured/participatory predictive or pre-emptive; 3), and finally, 4) protocol or rule-governed.

I explore the idea that practices in the ED, originally enacted in standard prototypical GP consultations, have prevailed in the institutional setting of the ED. Here they continue to be enacted individually and collectively, to manage the uncertainty, contingency and indeterminacy of working and knowing in the ED. Through these practices, I argue, nurses and doctors finesse their knowing at the bedside in moments of discovery (and confirmation) about the patient's condition or previously experienced care: they 'practise knowing' (Manidis & Scheeres 2013). In doing this, they know in practice. '[K]nowing in practice – focuses directly on the process of creating and using knowledge while organizing' (Gherardi 2006, p. xx [roman numeral]).

I conclude that the meta-framework provides a way of understanding of ED work based on what nurses and doctors *actually* do and say to manage the disciplinary and institutional exigencies of their work setting; rather than one based on the potentiality of their communicative abilities located in outdated notions of knowledge (transfer systems). Knowledge (and communicating) instead are recognised as spatio-temporal dynamic and emergent phenomena collectively distributed among practitioners, technologies and objects. The meta-disciplinary and institutional framework raises questions about the sustainability of the current model of ED care. As pressures increase on ED services, knowing, which needs to be recursively constituted, is increasingly difficult to do as nurses and doctors work across space, time and multiple patient and care materialities.

Chapter Eight brings together the findings of the study and the argument of the thesis. I conclude with a summary of new understandings of ED work that arise from the study. Firstly, in presenting a new meta-disciplinary and institutional conceptualisation of knowing in practice in EDs, the thesis reframes conventional approaches to addressing teamwork

and interprofessional communication in EDs. It shifts away from individual knowers/doers to a focus on their doings, sayings and beings as disciplinary and institutional – hence extra-individual (Kemmis 2009) – and teleological.

In Chapter Eight I also suggest that my findings extend understandings of the fragility and gamesmanship of knowing (in practice), its impermanence, contingency and predictiveness. I propose that what happens in the ED context might be considered as a microcosm of how 'knowers' are struggling to come to terms with increasing information loads, fast feedback scenarios (Crawford & Brown 2011), liquid modernity (Bauman 2006) and knowing in other complex settings.

In Chapter Eight I conclude that the thesis affords a novel, empirical exemplar of the interconnectedness of professional practice, healthcare communication, teamwork and individual/collective learning and practising in ED care. I explain why the study contributes a unique empirical and methodological examination of ED consultations. I also suggest further research that could examine dimensions of how knowing is resourced in the critical space of patients' bedsides in the ED in the moment prior to action.

1.6.   Concluding comments to Chapter One

In Chapter One I introduced the study in terms of sites, participants and its theoretical and methodological approaches. In Chapter Two I situate my empirical findings in a wide range of largely qualitative literature on organisational learning and practising, and health communication and teamwork.

Chapter Two – Locating the study

Purpose and flow of this chapter

In Chapter Two, I locate the study theoretically against a background of research on communication and teamwork in healthcare (and in EDs), addressing conventional understandings of, and approaches to, information (transfer) in, and related to, healthcare practice. This literature situates nurses and doctors' teamwork and communication capabilities in a predominantly individualistic and instrumental paradigm of conscious and intentional work, based on a particular view of (medical) knowledge.

I propose that given current demographic and efficiency pressures on EDs, and based on more recent theorisations of working, learning and knowing, understanding ED work from this more conventional perspective is insufficient and inadequate.

I introduce practice theory and its conceptualisation of knowledge, framing – in an embodied, non-cognitivist paradigm of knowing – how nurses and doctors work and communicate with each other while (re)producing ED knowledge. As such, this perspective provides a useful and dynamic way to understand ED work: patient and situational details are not merely understood as transferred (or communicated) instrumentally, but form a part of nurses' and doctors' knowing practices.

I then define key terms such as knowledge, information, knowing, organisations, institutions and timespace explaining how I understand and use these terms. I outline my understanding of practices, identifying the units of analysis I draw on for my data.

Finally I draw on some of the conventional reading on healthcare communication literature to acknowledge insights derived from this body of work. These include studies that address aspects of how information transfer and communication are impacted on by space, power, information seeking practices and the use of objects.

I conclude that a practice theory approach locates ED work in a complex, spatio-temporal paradigm of medical and nursing practice, providing a new way of understanding how nurses and doctors know in the ED.

2.1.   The prevailing view of ED (communication) work

Work in the ED is generally identified as uncertain and clinically and communicatively pressured (Coiera *et al.* 2002; Eisenberg *et al.* 2005; Manidis & Scheeres 2012; Nugus 2007). As a consequence key safety research on ED work focuses largely on communication (ultimately concerned with patient safety and the quality of patients' experiences) as it relates to disciplinary and spatial networking, teamwork and handover security (information transfer) (see, for example, Ayatollahi, Bath & Goodacre 2013; Cohen & Hilligoss 2010; Coiera *et al.* 2002; Cooper *et al.* 2007; Creswick & Westbrook 2008; Creswick, Westbrook & Braithwaite 2009; Eisenberg *et al.* 2005; Fairbanks, Bisantz & Sunm 2007; Iedema & Ball 2010; Kilner & Sheppard 2009; Morey *et al.* 2002; Nugus & Braithwaite 2009; Redfern, Brown & Vincent 2009a, 2009b; Risser *et al.* 1999; Singer & Dean 2006; Slade *et al.* 2008; Welch *et al.* 2013; Woloshynowych *et al.* 2007).

Although incidental face-to-face communication plays a major part (Coiera *et al.* 2002), in ED work, the handover is understood as a key, if not *the* key process of information transfer in EDs. The intended role of a handover is therefore considered an important part of ED care, understood to transfer diagnostic and treatment-related information, already known, and which will be instrumental in subsequent care. Handovers involve handing over patient and treatment information from one clinician to a subsequent clinician (with additional information like X-rays, previous notes, etc.), together with responsibility for the patient's care from then on. In attempts to improve their functionality and effectiveness, ongoing efforts are made to increasingly structure handovers through linguistic and protocol-based recommendations and requirements (Australian Commission of Safety and Quality in Healthcare 2013; Fenton 2006; Owen 2009).

In a relatively recent US review of published literature on the handover processes (in hospitals generally, not just EDs), the authors define a handover (or handoff, as it is called in the USA) as 'the exchange between health professionals of *information* about a patient accompanying either a transfer of control over, or of responsibility for, the patient' (Cohen & Hilligoss 2010, p. 493; italics added). In this review, the authors set out to examine definitions, content, locales and standardisation of handovers (with regard to patient and other information), concluding that there is little agreement on definitions and ways to standardise the process. Thus handovers might be understood as complex and multiple.

In their review Cohen and Hilligoss confirm: 'We focus on *information* because the function of handoffs is to increase the effectiveness of the actions taken by the receiving party' (p. 493; italics added), thus emphasising the link between what is said in the handover and what the next clinician does. They go on to say:

> [t]he primary objective of a hand-off is to provide *accurate information* about a [patient]'s care, treatment, and services; current condition; and any recent or anticipated changes. The *information* communicated during a hand-off must be *accurate* in order to meet [patient] safety goals (Cohen & Hilligoss 2010, p. 493, citing Requirement 2E in the National Patient Safety goals handbook 2008 put out by the Joint Commission)[8] (italics added).

Information (in a handover) is therefore understood as being central to patient safety and clinical knowing.

The basis of the reliance on handovers as a networking/information exchange process, and the concomitant teamwork it implicates, extends more broadly to how general communicative interactions in the ED (and more broadly in many hospital settings) are understood. Clinician-clinician communication (in and beyond EDs) is examined as an important feature of healthcare teamwork and/or interprofessional practice worldwide and in Australia (see, for example, Dunston, Lee, Matthews *et al.* 2009; Garling 2008; Matthews *et al.* 2011; National Health and Hospitals Reform Commission 2009; World Health Organization 2007). In this paradigm, healthcare communication research conceptualises communication as an individual/team responsibility, with collaborative teamwork portrayed as essential for effective (individual and team) and safe practice. As a consequence, in addressing teamwork and information transfer problems, health educators and managers focus predominantly on developing the capabilities and skillsets of individual practitioners and/or teams to manage and transfer so-called fixed, stable forms of information, and manage information transfer processes more effectively (Bomba & Prakash 2005; Redfern, Brown & Vincent 2009b; Ye *et al.* 2007). These initiatives include

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[8] The Joint Commission is an independent, not-for-profit organisation that accredits and certifies more than 20,000 health care organisations and programs in the USA.

how improvements and efficiencies can be facilitated through electronic patient record keeping and other ICT and/or technological systems.[9]

My study adds to the extant research by disrupting the information-transfer paradigm, situating what nurses and doctors come 'to know' or 'not know' in praxis, not in communication processes alone. My study explores the space of 'posttransfer activities' (Singer & Dean 2006, p. 753) – what happens to the handed over details about patients and their care – whether enacted in spoken texts (the handover report, a telephone or pager conversation) or in written texts (the patient's notes, whiteboards, written notes, etc.). My analysis challenges what has been until now a strong local belief about practice in healthcare generally (and in EDs), i.e. that details about patients (and work) are remembered, are secure, stable and accurate, and that these details are able to be transferred to, and will remain unadulterated by, subsequent recipients, as long as practitioners communicate effectively and work in harmonious and timely ways.

I reveal instead that handovers are an initial step, a partial facet, in the process of knowing – a process that is far more complex than giving responsibility of care and details (of the patient) to the next person in the chain of care (Cohen & Hilligoss 2010). The handover process itself and what is transferred in the handover process, may instead be thought of as 'knowledge pointers' – they codify what is important in the patient's care 'and highlight the [ ] salience' (Gherardi 2006, p. 85) of important details, but they do not necessarily inscribe these details into knowing. While the study's findings do not suggest that patient details are *never* transferred unproblematically or remain unprocessed at the time of the handover, much of the study's data challenge the basic underpinning logic and surety of the practice of handover being the key informational fulcrum for ensuring fixed understandings about the patient, and one on which much clinical practice (and safety research) is based. These findings present an elaborated view on transfer, communication and knowing (practices) in the ED.

2.2.   Shortcomings of existing approaches to understanding ED work

Given macro healthcare reform and demographic health trends, including the empirical data I will present in this thesis, the current approaches to understanding information

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[9] The EDIS (Electronic Data Information System) introduced into some Australian EDs in 2005 (then discarded in 2008) was such an initiative.

transfer, communication and teamwork in ED work are insufficient and inadequate to manage what is an increasingly complex and pressured work setting. Factors impacting on EDs include increasing presentations to and demand for ED services (Forero & Hillman 2008), new efficiency measures for emergency departments (AIHW 2013; Geelhoed 2012), and increasing attention to safety and the quality of patient care in the delivery of acute care services in NSW (Garling 2008). As noted above, the Garling review of acute care services, following a patient's death in an ED, recommended the need for improved interdisciplinary work, better management of patients and care processes in EDs and wards, and improved communication to improve safety and quality of care.

The existing approaches to communication and information transfer in EDs (and healthcare more generally) outlined above require a new focus to manage the growing complexity of ED work. The existing approaches emphasise a focus on individual communication skills and capabilities, and anchor information transfer (and what nurses and doctors come 'to know') in particular conventional understandings of knowledge and views of working (Manidis & Scheeres 2012; Nicolini *et al.* 2008). As stated above, the current model of ED care perpetuates the view that if multiple clinicians enact the medical interview, a 'regime[ ] of familiarity' (Zukas & Kilminster 2012) as their dominant activity, what they come to know from each of these interviews can be unproblematically transferred between them. Similarly there is a prevailing view that improving protocols for handovers and interprofessional communication (Garling 2008) and using new technologies to manage and store patient details will result in more effective information transfer.

ED managers remain bound to these approaches and solutions, despite the many studies identifying shortfalls in handover processes (of healthcare more generally) and in EDs, identifying issues of safety, unreliability of memory, absence of consistency (see, for example, Alem *et al.* 2008; Apker, Mallak & Gibson 2007; Manidis, Iedema & Scheeres 2012; Talbot & Bleetman 2007; Ye *et al.* 2007); issues with poor teamwork and/or problematic teamwork communication (see, for example, Cooper *et al.* 2007; Eisenberg *et al.* 2005; Iedema, Merrick, *et al.* 2008; Kilner & Sheppard 2009; Morey *et al.* 2002; Owen 2009; Risser *et al.* 1999; Schenkel 2000); and growing numbers of critical incidents (Gross 4 July, 2012, The Australian Financial Review).

To date, little consideration, particularly in ED research and work, has been given to the impact of space, time, noise, idiosyncratic understandings, disciplinary interests, audibility, miscommunication, staff scheduling and work pressures on information transfer and how this relates to knowing. Exceptions to this include some relatively recent studies that have tried to come to terms with more complex approaches to understanding how information transfer, communication and interprofessional relationships in the ED operate. These studies take into account space, clinical pressures, time, interprofessional rivalries and more elaborated understandings of information use, information seeking and communication (see, for example, Ayatollahi, Bath & Goodacre 2013; Coiera *et al.* 2002; Eisenberg *et al.* 2005; Iedema, Merrick, *et al.* 2008; Nugus 2007; Nugus & Braithwaite 2009; Nugus, Bridges & Braithwaite 2009; Nugus *et al.* 2010; Welch *et al.* 2013; Woloshynowych *et al.* 2007). Few studies, however, have taken account of emergent realities of how working, learning and knowing might be understood in practice in the ED. Exceptions are studies by Redfern (2009a), as noted above, Nugus *et al.* (2010) and Manidis and Scheeres (2012), all of which begin to address some of the complexity of communicating and knowing in practice *in situ* in EDs.

Beyond EDs, there is a small number of communication and organisational researchers who have considered more complex approaches to healthcare teamwork, hospital spaces, power and communicative complexity in healthcare settings in an attempt to present a complex view of working, learning and practice. These studies address, for example, aspects of the multiplicity of interdisciplinary conflict between clinicians (Lingard *et al.* 2002); how team architectures and power impact on the language of teamwork (and what this means – implicitly – for team knowing) (e.g. Finn 2008; Finn & Waring 2006); how collaborative information seeking is done (Paul & Reddy 2010a; Reddy & Spence 2008); how communication is organisational, complex and intimately connected to safety (Iedema 2009a); how knowing is embodied and not merely a cognitive process (Hindmarsh & Pilnick 2007); and finally how important learning opportunities are for junior doctors in medical settings (Kilminster *et al.* 2010; Zukas & Kilminster 2012). Of note among this kind of research is the extensive contribution of Iedema who has investigated a range of communication issues in healthcare settings, particularly relating to patient safety, as well as learning and professional practice in healthcare environments (Iedema 2009a; 2009b; 2011b; 2006; 2008). Iedema's and his co-authors' work has provided an extensive

perspective on institutional communication and what it means in the complexity of healthcare today.

Iedema is one of the few applied linguists who makes explicit the complexity of communication in organisational contexts and posits that where there are complex institutional and social dynamics, researchers must consider more than communication (or what is sometimes, in the field, called language, discourse or talk). He suggests that a study of discourse (word, sentence, text) alone is a grave reduction of what is actually going on *in situ* (Iedema 2011a). Iedema proposes that 'the 'structure of attention' that informs discourse studies should broaden out from its linguistics-based, object-oriented methodology' (Iedema 2011a, p. 1172) to implicitly embrace and include more process-oriented and wider organisational happenings – something that can be useful to the field in understanding organisational practice. This aspiration is shared by others who have urged communication studies (or applied linguistics studies) in healthcare to be relevant to healthcare practitioners and service deliverers. Notable amongst these are Sarangi & Candlin who agree that findings should be relevant to practice, but they caution researchers about making inferences about professional practices based on linguistic insights alone (2003). Sarangi's commitment to the practical relevance of communication to healthcare practice is reflected in his early work which takes a broader view of how talk, work and the institutional are interconnected (Sarangi & Roberts 1999b).

Since this publication, however, research over the past two decades has focused on a predominantly linguistic, individualistic and instrumental view of healthcare communication practices, underpinned by a particular view of knowledge (Nicolini *et al.* 2008). This, by implication, has influenced healthcare's understandings of individual and collective knowing in work settings, viewed predominantly as an information transfer and communication model as stated above. In this model, the ED consultation is still based on a prototypical GP consultation originally designed for a care paradigm involving one doctor and one patient. As the diagnostic institutional equivalent of a prototypical GP consultation, this activity now involves one patient (and carers) and multiple clinicians, working over time in a very different spatial and disciplinary set of arrangements. The doctor-patient consultation is an enduring patient-clinician activity (Roter 2000) and has prevailed into the institutional setting of EDs, not unlike other invisible practices of the 'patient-doctor dynamic', such as time pressures, fears and goals of the doctor that remain

unknown to the patient, etc. These all continue to shape (not necessarily in a positive way) what occurs in institutional care (Fischer & Ereaut 2012). It is now evident that the complexity of the information needs of emergency clinicians, how these needs are enacted through talk (Ayatollahi, Bath & Goodacre 2013), and how information is managed and is understood to be transferred there (or networked knowledgeably) (Manidis, Iedema & Scheeres 2012; Redfern, Brown & Vincent 2009a) are increasingly challenging the conceptual design of the ED consultation itself.

What is needed therefore is a deeper understanding of learning and knowing in organisational settings and understandings of how individual nurses and doctors are implicated by institutional and disciplinary exigencies in working with patient details and in communicating with patients and with each other, particularly in the ED. This would include greater recognition of other aspects of practice such as ways in which space, time, objects, people, power and language are interwoven in the ED: in short, how knowing is accomplished in the full complexity of practice not merely through information transfer and communication processes alone.

This broader view recognises teleologies of, and attachments to, professional learning and work that characterise medicine and nursing. In such a paradigm, learning, knowing and communicating are understood as being steeped in disciplinary paradigms and in socio-material and spatio-temporal realities (Bruni, Gherardi & Parolin 2007; Contu & Willmott 2003; Gherardi 2006; Green 2009a; Kemmis 2009; Nicolini *et al.* 2008; Sarangi & Roberts 1999b). These approaches recognise that, as such, care practices and the interprofessional communication habituations on which they are premised, for example, are difficult to change at will as is suggested by much of the 'communication training' and 'handover protocol improvement' literature.

Given the pressures EDs are now increasingly facing, including growing numbers of critical incidents, a complex view of ED work, its team activity and team knowing is timely. A deeper understanding is required of the disciplinary and institutionally based orderings that the ED consultation enables in this space. I do not seek to question the contributory role of good clinical teamwork to safety in the ED, nor do I question improvements that may result from additional handover protocols and or ICT improvements to information transfer. Rather I seek to present a complex view of how knowing might be collectively done and/or understood in practice in the ED.

Current approaches do not go far enough in understanding ED work, given more recent theorisations on how learning and knowing are now understood in organisational settings. Although team (communication) and team (information) studies have been undertaken in EDs and in other acute contexts this is the first study to investigate collective activity and knowing across (a) complete consultation(s). I draw on key concepts in understanding collective activity and knowing afforded by practice theory conceptualisations of 'practice(s)', including professional practice(s), explained below. In this paradigm, nurses' and doctors' practices are understood as extra-individual, underpinned by disciplinary, personal and institutional knowledges and teleologies.

2.3.   What practice theory offers

I therefore locate this study in practice theory perspectives that offer different understandings of information transfer and its associated communicative processes. Practice theory concepts, as theorised by organisational scholars Gherardi (2006), Orlikowski (2002) and Schatzki (2005, 2006, 2009), offer a valuable lens to better understand the complexity of ED work. Their approaches in particular take a broad view of practice and begin to interrogate institutional aspects of work and how these impact on what nurses and doctors do and say, i.e. their work and communication.

I go beyond conceptualising teamwork and communication as instrumental individual capabilities which take little account of the *in situ* complexities of how communicating and teamworking are done, and propose that practice theory approaches to organisational practice provide a useful lens to understand disciplinary (vested interests, knowledge hierarchies and attachments) and institutional (space, time, objects) constraints under which work and communication take place (Gherardi 2006). Practice theory approaches consider these elements to be interconnected: communication, disciplinary allegiances, time, space, materialities and 'knowing' cannot be fully understood in isolation from each other – together they constitute what is going on. This is particularly important given the increasing complexity of ED work.

Underpinning these is how knowledge is understood. I begin by defining knowledge and other key terms, followed by an outline of what I understand by practices.

Defining knowledge, knowing, knowing in practice, information, and not knowing

Conceptions of knowledge are essential to understanding the argument of this thesis. Knowledge may be understood in predominantly cognitive terms, as a possession and/or as something that is done together (Cook & Brown 1999; Gergen 1985; Sfard 1997), i.e. as a socially-agreed knowing. In the former case, the focus of work and organising is on the transfer of possessed knowledge by individuals, rather than on the *in situ* activity of how knowledge is (re)produced. In terms of learning, Sfard's seminal paper on the metaphors of *acquisition* and *participation* outline the educational debate on these different understandings.

In much of the literature reviewed above, and in the healthcare sector itself (Nicolini *et al.* 2008), nurses and doctors are conventionally held accountable individually and in teams, for communicating patient and treatment details. In terms of more recent theorisations about knowledge in organisational settings, the health sector has not kept up with other industry sectors in understanding knowledge and its relationship to working and knowing (Nicolini *et al.* 2008). In a wide-ranging review of knowledge management in the health sector, Nicolini and his co-authors present a complex picture of how the sector manages knowledge, how it responds to outside research, how it develops local networks and how professional rivalries are maintained by the sector's hierarchical knowledge structures. The view of knowledge in the sector is one where knowledge is objectified; it is understood as a resource that can be managed (therefore ICT systems can assist to do this – although clinicians have resisted such solutions) and knowledge is generally seen as a product that can assist healthcare (a hospital?) to compete, to create and improve. There is an assumption of a linear relation between action and knowledge and scant consideration of more recent theorisations of how knowledge is understood in organisations, i.e. as knowing, as a dynamic, emergent activity that is fluid and processual.

As a result of these perspectives and structures, the sector has historically linked (and still links) disciplinary knowledge to forms of work control. This has resulted in prior and ongoing professional divisions within the sector, all of which maintain barriers to knowledge sharing.

One of Nicolini *et al.'s* review findings of interest to this study is that clinicians prefer local and collegiate knowledge – based on the experiences and interactions of their colleagues – over sources such as scientific research for example (2008). These findings suggest that in essence social and physical proximity are key to knowledge sharing in this sector (within

disciplines). Despite this knowledge sharing in practice, pedagogical approaches in medical education have resisted socially-shared views of knowledge learning and doing (Bleakley 2006).

Finally, Nicolini *et al.'s* review acknowledges the overwhelming explosion of clinical information in the sector, and the associated paradox in practice in which clinicians cannot find the information they need when they want it (see also Currie *et al.* 2003). This adds to uncertainty and 'not knowing' (Yamauchi 2009), which I address in Chapter Six.

Practice theory takes an alternative view of knowledge and provides

> a theoretical lens through which to view knowledge in non-mentalist and anti-cognitive terms. For practice theorists, knowledge is not an object captured by means of mental schemes: rather it is a practical and collective activity, and it is acquired not only through thought, but also through the body and sensory and aesthetic knowledge (Strati 2007 in Gherardi 2009, p. 354).

From a practice theory perspective, knowledge is 'embedded in action or practice and is an inherent part of it' (Savolainen 2009, p. 5; see also Cook and Brown (1999) and Orlikowski (2002)). Gherardi (2009) outlines three ways that knowledge has been conceptualised within a community of practitioners. The first arises from the theorisations of Lave and Wenger (1991) who saw knowledge as *contained* within a community. Following this, Cook and Brown (1999) developed the notion of knowledge as one part of a binary concept, with knowledge on the one hand and knowing on the other. The relationship between the two, Cook and Brown describe as 'a generative dance'. For them 'knowledge is about possession, whereas knowing is about relation' and this 'relation' constitutive of knowing is perceived to be 'about interaction between the knower(s) and the world' (p. 388). Knowledge and knowing are *mutually constituted*.

Thirdly, Gherardi posits that knowledge (or knowing as she sees it in terms of activity) can be thought of as being *equivalent* to practising. This is the basis of the way in which she describes how practitioners draw on multiple knowledges in the environment (Gherardi 2009) – social, material and artefactual knowledges in a field of practice, in a setting – to know in practice. For her knowing in practice is a practical accomplishment, and knowing as a capability is enacted by practitioners who participate in the complex web of material artefacts, relationships among people, and activities in a setting (Gherardi 2001). For Gherardi, knowledge can be understood as a social process, comprising human, material,

aesthetic as well as ethical and emotive components. '[K]knowledge is embedded in practice … [it is the] domain where doing and knowing are one and the same' (Gherardi 2006, p. xii). Therefore, in practising, knowledge is (re)produced (Gherardi 2008), an understanding I have found useful in explicating how knowing emerges and is accomplished in the ED consultation.

Schatzki defines the relationship between knowledge and practices differently. According to him, practices have 'two basic components: actions and structure' (Schatzki 2006, pp. 1863-4). The structure *organises* (although not necessarily consciously) a participant's actions: practices are structured as 'manifolds of action' (Schatzki 2006, p. 1864) with underpinning knowledges that guide what people do and say. He elaborates on this idea by explaining that:

> [t]he structure, or organization as I prefer to say, of a practice embraces four
> principal phenomena: (1) understandings of (complexes of know-hows regarding)
> the actions constituting the practice; (2) rules, or protocols [by which Schatzki
> means] explicit directives, admonishments, or instructions that participants in the
> practice observe or disregard; (3) a teleological-affective structuring, which
> encompasses a range of ends, project, actions, maybe emotions, and end-project-
> action combinations (teleological orderings) that are acceptable for or enjoined to
> pursue and realize; and (4) general understandings, for example, general
> understandings about the nature of work [that practitioners use or draw on in
> action] (Schatzki 2006, pp. 1864-5).

Both Schatzki and Gherardi therefore recognise knowledges underpin action, and for both theorists, knowing is relationally and situationally connected to a site, or work setting (Gherardi 2009; Schatzki 2001a). They differ however in their approach on the role that objects (materiality) and human action (underpinned by knowledges) are accorded in practising, which I examine further below.

Knowledge is significant for ED work as it is based extensively on patient and treatment details 'objectified' or 'codified' in notes, handovers, etc. In practice theory terms, this can be understood as 'knowledge as object', a materiality of nurses' and doctors' work. This is useful in terms of ED work, because in the ED, along with objects, collegiate relationships and interactions, nurses and doctors *draw on* patient details, earlier treatments and doings, team whereabouts, clinical data, etc. and other sources to resource their knowing. Knowing

for nurses and doctors incorporates the activity of working with the practical and general understandings of their practice and institutional knowledges – including patient and treatment details – through their doings, sayings and beings. Knowing is not only cognitive, as nurses and doctors feel, see, hear and sense things about their patients, their colleagues and their work: knowing is also embodied and affective (Strati 2003).

I use the term 'knowledge' when referring to larger collective or cumulative aspects of disciplinary or institutional understanding, for example: there is no cumulative *knowledge* about the patient; or nurses and doctors work in different *knowledge* networks;[10] or nurses and doctors do not share each other's practice *knowledges*.

I also use the term 'information' in specific ways in my discussions. Savolainen, an information theorist, identifies information as a resource used to inform action. For him "information use' may be understood as doing epistemic work that is done as an inherent part of action or practice' (Savolainen 2009, p. 10). As such, details about patient and work processes could reasonably be assumed to be used knowledgeably, i.e. to accomplish knowing in action when caring for patients. This accords with the practice theory understanding of knowledge as object, i.e. a materiality drawn on in practising (see below). As Godbold and others point out, using the words 'information' and 'knowledge' can be problematic (Godbold in press). Godbold points out how

> a range of theorists in the social sciences have presented compelling reasons for focussing on verbs rather than nouns when considering how people understand and make meaning in situations (Dervin 1999b; Mol & Law 2002; Weick, 1995, p. 187). Gherardi (2009) purposefully shifts her discussion from knowledge to knowing (Godbold in press).

When I refer to how the ED conceptualises codified patient details – handover information and patient notes, etc. – I use the terms 'information transfer' as this is how the sector refers to and understands these objectified materialities.

I use the term 'not knowing' (Yamauchi 2006) to describe what occurs when workers (in my case nurses and doctors) do not have the knowledge/capability required to do work. Not knowing can arise in a number of ways. Not knowing may arise from not knowing 'what' (i.e. this can range from them having no idea of what to seek to lacking

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[10] I use the term knowledge network for 'knowledge as object' located in the network.

information); not knowing 'who' (i.e. they don't know who knows); not knowing 'why' (i.e. they don't know why things are the way they are); not knowing 'how'; or finally, they do not know that (or what) they do not know, what Yamauchi calls 'not knowing *not knowing*' (2006, p. 62). Knowing and not knowing are intricately connected.

Defining the relationship between working, learning and knowing

Practice theorists agree that learning and knowing are situated phenomena, which would apply in a work setting, but there are several views on how situated learning and knowing are related to each other. For Gherardi people learn (to know) through participation in practices (2008). Knowing in practice is a practical accomplishment, and knowing as a capability is enacted by practitioners who participate in the complex web of material artefacts, relationships among people, and activities in a setting (Gherardi 2001). The arrangement of the people, material artifacts and activities, i.e. the way knowledge is (re)produced there, is a product of the community of practitioners. Gherardi's notion of *equivalence* outlined above situates learning and knowing (and working) as inherently connected.

Although Schatzki does not extensively address the question of how individuals or groups learn (practices) in organisational settings, his ideas on learning (practices) share some but not all of Gherardi's understandings. Schatzki sees life (a site) as ontologically social. I understand this to mean that for him, the nature of being – our lives and practices – are socially-learned, derived and perpetuated. As such a work setting is also a site of learning, a *locus* in which practices are socially learned (Schatzki 2002, 2011). The situatedness of learning is also recognised by Gherardi (2006, 2008). However, Schatzki adds that learning is shaped by teleoaffective structures enacted through activity. Activity in its turn,

> is governed by practical intelligibility, which is itself determined by mental conditions, many of which form … during the processes of learning and being trained and instructed to carry on the practices involved (2002, p. 81).

Defining organisations and institutions

The terms 'institution' and 'organisation' are occasionally used with different meanings. I propose that hospitals are institutions. Yet, I refer in many instances to the ED as 'an organisational setting'. I discuss the ED's site ontology – the way that 'bundles of practices

and material arrangements' combine in that setting (Schatzki 2005). I draw on Schatzki's and Gherardi's work(s), in which learning, organising and practices are organisational rather than institutional.

But I also use the term institution (when I talk about the meta-disciplinary and institutional framework of practices in Chapter Six) and I introduce the idea that nurses and doctors learn through the institution. I use this term for a number of reasons. Sarangi and Roberts first identified 'the institutional order' of hospital discourses and practices (1999b). For them, a workplace is a 'social institution where resources are produced and regulated, problems are solved, identities are played out and professional knowledge is constituted' (Sarangi & Roberts 1999b, p. 1). They connect this 'institutional order' with the 'interaction order' based on Goffman's ideas of 'shared habitual practices' (i.e. interactional orders) (Sarangi & Roberts 1999b, p. 3) – the structuring of participation in a given social situation. They explain that the institutional order

> coincides with Foucault's (1981) concept of the 'order of discourse' – an
> overarching framework within which local practices and individual agencies are
> situated and transformed over a period of time – indeed over epochs if we want to
> trace discursive transformations (Sarangi & Roberts 1999b, p. 4).

Thus, there is a tension in my thesis between the terms 'institution' and 'organisation', which might be best understood in professional practice terms. A profession stretches above and beyond a site, but is also enacted in a site. Therefore, the material arrangements, people, space and interactions (the practices) in the ED are organisational: they comprise a site ontology (Schatzki 2005), a unique arrangement of practices and material arrangements. But ED work also connect to the wider institution of the hospital and to the institutionalised practices of medicine and nursing which are disciplinary and extant in other settings and contexts. So the institutional perspective encompasses multiple organisations (and practices): hospitals, private rooms, GP practice and so on. Thus, the ED organisation is time/space specific but nurses' and doctors' practices apply in other contexts of healthcare. The ED reflects its practitioners' clinical and discursive practices, its socio-material arrangements and spatio-temporal contingencies. In this, the concepts of socio-material and spatio temporal are conflated in Schatzki's (2009, 2010b) notion of timespace.

Defining timespace

In this thesis the term timespace encapsulates the social, material, spatial and temporal features of a setting. According to Schatzki, individual and collective doings, sayings and beings are closely connected to the real and metaphorical timespace (Schatzki 2009, 2010b) in which individuals and groups find themselves as motivated beings. Thus, practices that manifest in particular places/contexts are not random. Rather what people do and say in a setting is governed by what they know to do (through a multiplicity of knowledges). Individuals' practices are thus circumscribed by the contextual setting in which they find themselves, its material arrangements, objects and teleologies – its past histories and future ways of doing, saying and being – to which they are attached. For Schatzki, this space/time notion is simultaneously situated historically, in the present and in the future: people, their doings, sayings and beings, are connected in a continuum of experience and co-existence.

The teleoaffective structuring underpinning a practice (or practices) has been key for me in understanding the learning and knowing paradigm of the ED. Schatzki identifies that an individual's and/or a group's motivations, beings, desires and beliefs, the timespace(s) in which he/she or they find themselves, is a constitutive dimension of their activity. This means that activity is always underpinned by attachment, which is teleological – it is goal oriented – but is also based on past histories, presents and futures of action. Schatzki describes how actions unfold in chronological time, but practices are connected to his idea of teleological time. In teleological time, actions are responses to the past, while individuals are focused on the future: this is 'a joining of the teleological, past, present and future' (2006, p. 1871). If individuals and or groups have divergent timespaces, this can significantly impact on the relational climate between individuals or groups, such as nurses and doctors with different timespaces in a particular setting. This means that a particular setting brings together people with divergent teleologies. For Schatzki, conflict and power manifest anywhere that either individuals or groups possess 'incompatible or disharmonious goals, projects, experiences, emotions, or desires' and thus 'conflict and power are temporalspatial phenomena' (Schatzki 2009, p. 88). This reconciles with Foucault's theorisations (outlined by Sheridan 1977) that power emerges from people identifying with particular practices, goals, reasonings and relations. This has been central to understanding the differences in the knowledge hierarchies of doctors, nurses and patients, and their respective attachments to these disciplinary knowledges, as well as their

different emotions, desires and projects. While overtly shared, these are often in disciplinary, if not individual, conflict.

The practice theory understandings of knowledge and timespace, as outlined, shift the focus of work (and of research) from individuals to practices, allowing a complex understanding of ED work. Nurses and doctors are not merely doing ED work, but learning and (re)producing ED work and knowledge. In this case, emergence, timespace and materiality are important and not just background to nurses' and doctors' communicative and relational undertakings. Information and information transfer (and the way these are managed interprofessionally) in the ED are embedded in these undertakings.

This more holistic understanding enables a deeper understanding of what is required for EDs to change as ED care evolves, given the current pressures on it to do so. A focus on practices allows an examination of how knowing is mediated, contested and distributed collectively – not merely individually. This approach reframes ways knowledge and relationships central to patient-clinician and clinician-clinician communication might be understood. These are embedded in practices.

Defining practices

I use the word 'practice' in a number of ways. When I refer to nurses' and doctors' practices I am referring to disciplinary doings, sayings and beings that are recognisable (to themselves and others) and reproduced by them. I use the term 'in practice' referring to what happens in the actuality of everyday work, drawing on the more colloquial use of the word. I also use the term 'ED practice' (occasionally ED work) to refer to a broad understanding of what transpires in the ED, beyond the practice(s) of the consultation. In Schatzki's words, '[m]ost activities are elements of one or more practices. This means that most activities extend the manifolds of extant and past activities that compose one or more practice [for example that of the ED consultation]' (2011, p. 8).

I use the term 'practice knowledges' to refer, as does Reckwitz, to ways that nurses and doctors 'understand the world and themselves, and use know-how and motivational knowledge, according to the[ir] particular practice[s]' (2002, p. 256).

Reckwitz distinguishes between 'practice' and 'practices', where the former 'represents merely an emphatic term to describe the whole of human action (in contrast to 'theory' and mere thinking)' (Reckwitz 2002, p. 249).

'Practices' in the sense of the theory of social practices, however, is something else. A 'practice' (Praktik) is a routinized type of behavior which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (2002, p. 249).

Reckwitz's definition of the plural and the singular (of practice(s)) allows the interchangeable use of each, with the singular referring to the more abstract concept of, say, medical practice, and the plural to describe routine doings, sayings and beings of individuals.

Green (2009b) examines professional practices and agrees with Schatzki that there is not a

'unified practice approach' (Schatzki 2001, p. 2) across this grouping, it [practice] needs to be understood rather as a 'loose, but nevertheless definable movement of thought that is unified around the idea that the field of practices is the place to investigate such phenomena as agency, knowledge, language, ethics, power and science' (Schatzki 2001, p. 13-14 in Green 2009b, p. 42).

Gherardi (2008), with a greater interest in ethnomethodology, linguistics and knowing, traces modern approaches to her own and others' practice-based studies (2008). Her tradition is located within several streams of theory/research which range broadly across studies of situated action as far back as the 1960s (Schutz 1962), to more recent multiple streams of Activity Theory (beginning with Vygotsky (1960s), moving to Cole, Engestrom, Lave and Wenger, Wenger and Blackler in the early 2000s) (Gherardi 2008, p. 522).

I draw on Gherardi's perspectives to examine how knowing emerges as it is accomplished in the consultation as nurses and doctors engage with the materiality of the ED setting. I have found this central to understanding 'knowing in practice', Gherardi's concept in which there is a focus on emergence (of learning, knowing) that is situated, and shaped reciprocally by materiality and humans. However in examining the empirical data of the ED consultation and nurses' and doctors' work as professionals, I have also found Schatzki's perspectives on the structures of social practices, with his emphasis on teleoaffectivity, rules and protocols, general and practical understandings that underpin actions and activity, to be important to understanding what nurses and doctors do in their everyday work. His perspectives allow me to explore how practices have prevailed into the

ED, how rules and protocols underpin medical and nursing work and how nurses and doctors draw on 'practical intelligibility' and do what makes sense to them to do as part of ED work (Schatzki 2001b).

In my research design and in my data analyses in Chapters Four, Five and Six, I explore the tensions between these two perspectives through the empirical data of the study. I examine how knowing (and learning) emerge as nurses and doctors respond to and engage with sociomaterial elements of ED work (Gherardi 2006). However I also explore how nurses and doctors perform disciplinary actions and activities in their (social or) practice roles amid and in response to materialities, but actions and activities that I would suggest are prefigured or agentive (Kemmis 2009; Schatzki 2002).

It is at this interface that Gherardi and Schatzki diverge in their understandings of practice. While Gherardi and Schatzki both recognise that practices and the sociomaterial are closely interwoven, they differ in how they understand this relationship. For Gherardi there is symmetry between human activity and the sociomaterial in the situated moment, for Schatzki 'practices, and the arrangements they establish, largely mediate the causal relevance of materiality for social life' (2002, p. 118) through the performances of actions as they unfold. In other words, for Schatzki, even though materiality is an integral part of action, activities or practices (Schatzki 2002, 2010), there is asymmetry between human activity and materiality.

In my argument therefore, I propose that although knowing and learning emerge during the consultation (Gherardi 2006), these are not necessarily confined by the practice in space and time. Nurses and doctors come to the consultation with prior knowledge and after the consultation learning and knowing continue. In the consultations I examine for instance, how practices prevail, how general understandings, knowing and learning are carried over from one consultation to the next, how rules and protocols of ED work 'work', and how the open-endedness of what nurses and doctors do and say (Schatzki 2006), explicate aspects of knowing in practice in this consultation and in others (alongside aspects of knowing in practice which emerge). I examine therefore how aspects of knowing before, in and after, practice, are instrumental in learning and knowing even when the practice is not happening or when people and/or materialities are not present or agentive (Schatzki 2009).

Investigating what goes on in the ED I draw on elements of each of these theoretical approaches. For example, in my critique of the model of ED care, in which materialities and nurses and doctors appear as reciprocally 'mangled' and interwoven (drawing on Gherardi 2006 and Pickering 1993) through which learning and knowing emerge, I contend, based on my empirical data, that nurses' and doctors' disciplinary activities, through practices, 'implicate a world amid and with which [the activity of the ED consultation, its learning and knowing] proceeds' (Schatzki 2002, p. 106).

In summary, I explore Gherardi's and Schatzki's theoretical positions through the analyses of my empirical data. On the one hand, knowing and learning emerge as the consultation unfolds, yet I contend that nurses' and doctors' disciplinary actions and activities in the data are also evidentially end-directed and extra-individual, located in praxis, not discrete minds. While I recognize that these two theorists provide different ontological perspectives on practice, my empirical data and ED work suggest that in this real world setting, these perspectives can be examined alongside each other to explicate the complex setting of ED. As I state in Chapter Five, learning and knowing (and their theoretical underpinnings) can be seen as abstractions glossing over the hurly-burly of the ED's *in situ* work.

In Chapter Three, I revisit these intellectual trajectories to examine the different methodologies utilised to examine these approaches to practice.

A practice theory approach allows a focus on 'the activity setting with its structures and material conditions that entails particular selves, skills, values and sensibilities, and ways of acting and doing things' (Talja 2010, p. 208) as well as a focus on the conversations and interactions in these activity settings. A practice theory approach goes beyond analysis of merely 'situated (inter)action' (Talja 2010, p. 208). In this Talja draws on Lave's (1988) critique of ethnomethodologists whose analysis is principally of the conversation and interaction and not the broader aspects of practice even though they conceive of their 'partners in conversation and interaction [as] corporeal, embodied, and part of time-space loci' (Talja 2010, p. 208).

I draw most heavily on key concepts of Schatzki and Gherardi in this thesis for a number of reasons. Firstly, in seeing the ED as an organisation, I draw on Schatzki's conceptualisations in two journal articles, one the *Sites of Organizations* (Schatzki 2005) and two, *Organizations as they happen* (Schatzki 2006) to examine practices in the ED. Schatzki describes how the 'organization happens' in the ED through the 'unfolding of the

performances' (Schatzki 2006, p. 1863) of discursive and clinical actions. The way sayings, doings, and beings (as actions) unfold in the space of the ED and over time, amid its material arrangements, provides a way for me to understand each 'event' (of talking to the patient and or clinical doing) (Schatzki 2011), as a bounded physical or discursive action involved in ED care. I have focused on how these occur in the space and time of patients' consultations, and also how the relationships of doctors and nurses and their different ways of being in the world are connected.

I draw extensively on Gherardi's (2009) concept of knowing in practice to understand how nurses and doctors learn in the ED and know in practice.

I also draw on Orlikowski (2002) who focuses on the iterative accomplishment of knowing actions – where skilful practice must be achieved each new time something is done. Her theorisations have informed my analysis as I focus on the iterative reconstituting of knowing that doctors and nurses undertake in the ED: whether this is knowing how or knowing that.

Because the ED is a professional setting, I also draw on the work of Green (2009b) and Kemmis (2009) who have examined practices in professional contexts. Green suggests that it is useful to tease out the colloquial and technical usages and meanings of the word practice(s) and professional practice. He distinguishes between colloquial uses of the word 'practice', which address different aspects of practices, including 'practising a profession' or 'practising professionalism' or 'being professional' or 'being a professional' as opposed to 'being an amateur' (2009a, pp. 6-7). He points out that all of these usages of the word 'professional' imply identity and disposition – in which professionalism, or being a professional, implies an adherence to ethics or adherence to particular ways of behaving which are generally regarded as standardised, recognised and maybe even lofty.

Green draws on Evans who argues that

> practice must be understood in terms that go beyond mere activity, as 'a richer and fuller concept than can be represented by its doing, that is, by being equated with what even the most capable practitioners do, which would be to 'make the mistake of equating practice with its performativity rather than its praxis' (Evans 2007, p. 554 in Green 2009a, p. 11).

This relates to 'the Freirian notion of praxis as action-full-of-thought and thought-full-of-action', 'engaged work in and on the world' (Evans 2007 p. 554 in Green 2009a, p. 11). This would involve conceptualising beyond performance, which is generally implicitly equated with practice in medicine (Kilminster *et al.* 2010). There is more to what is done than just what is seen or heard. Professional practice involves and expresses values, like the value of care (Noddings 1984). Practices thus incorporate motivation, materialities and intentionality, i.e. there are meanings and motivations behind what nurses and doctors do and say, and how they relate (Kemmis 2009) in EDs, what Schatzki calls 'the teleological(-affective) structuring' (2006, p. 1868) of practices.

Settling on a unit of analysis for practices

Green discusses the difficulty of settling on a unit of analysis to examine practice(s) in a research context as well as questioning how to deal with the 'problem of representation' (2009b). To resolve this, Green proposes the nesting of three interconnected concepts, namely practice, activity and action in what he calls 'descending order' (2009b, p. 47). By this he means that '*practice* consists of *activities*, carried in and realised through the flow of *action'* (italics added).

I understand these three terms from his theorisations as follows: a *practice* is 'work', guided by more abstract understandings of action that is both conscious and unconscious. A *practice* comprises 'a purposeful and strategic 'invention, within limits, and as such, an interplay (literally) of freedom and constraint' (Polkinghorne 1997, p. 10 in Green 2009b, p. 46). *Activities* can be understood as the way professionals' linked doings and sayings and beings are 'performed' (Schatzki 1996, p. 90 in Green 2009b, p. 47) or enacted bodily and knowingly *in situ*. In ED care activities include history taking, doing observations. And finally, professionals' *actions* are the concrete, observable events of a doing, saying or being; for example, in the case of the ED, the insertion of a cannula, the using of a thermometer, the taking of a temperature, the moving of a hand, a gaze, a touch on the arm, the use of equipment, the questioning of a medical history, or the soothing and reassuring comments to an anxious patient. 'Doings' here include 'sayings' and 'beings' (or relatings) as these, *qua* actions, are also aimed at achieving a change in the world (Kemmis 2009). This end point of achieving change is intrinsic to Kemmis' definition of practices which he sees as 'embedded in sets of social relationships as meaningful activities that bear on particular

parts of the world to produce products and transformed states of affairs' (Kemmis 2009, p. 22).

My unit of analysis in examining the data draws on each of Green's three interconnected nestings of practice(s) at different times. On occasion I describe nurses' and doctors' practices as doings based on more abstract, higher order, professional activities, imbued with ethical, lofty mindful praxis, i.e. their medical and nursing professionalism. The meta-disciplinary and institutional framework of practices I present in Chapter Seven reflects these abstracted, professional doings, attachments and values.

On other occasions, I describe the kinds of activities nurses and doctors undertake in relation to each other where their disciplinary activities and knowledges differ markedly; how they perform or enact their practices in particular contexts and situations, such as activities that define their authority, including how this is done through sayings (see also Heritage & Raymond 2005), activities involving medical or nursing expertise, activities of clinical caring. And finally, I describe what I see doctors and nurses visibly doing and saying at the level of direct engagement with patients in touching, speaking, relating to and treating them. These distinctions might be thought of as systemic/professional imperatives – the practice; nurses' and doctors' activities as the doings, sayings and beings and instances of doings, saying and being as the actions.

The premise of this thesis is that nurses' and doctors' practices are not merely individual (capabilities), but systemic, institutional, disciplinary and extra-individual, enacted in and through activity. Because of this, nurses' and doctors' practices, including how they attend to the safety and quality of patients' experiences in the ED, might be understood in extra-individual terms, embedded in social activity, rather than as individually based and cognitive capabilities. Actions unfold 'as the [ED] happens' (Schatzki 2006), perpetuated through the organizational memory and through activities which are embedded in the ED's social practices.

I situate nurses' and doctors' sayings (and their teamwork) as learned practices, embedded *in situ*, in disciplinary, material and institutional arrangements, and as teleological components of medical and nursing work. By adopting theoretical perspectives of practice theory and linguistic ethnography, communication and teamwork are not examined as privileged components of, or in isolation from, disciplinary and institutional elements of work, and separate from how knowing is done. Communication and teamwork practices –

sayings, doings and beings in the ED – I understand as collective, teleoaffective, disciplinary and institutional activities, involving people, knowledge, space, objects, time and language. Thus I use different terminology to some of the conventional research itemised below when referring to communication between nurses, doctors and patients, and I identify their sayings *qua* doings as discursive practices. This means I understand discursive practices as praxeological and interactional in line with practice theory and linguistic ethnography understandings (Gherardi 2006; Rampton 2007; Rampton *et al.* 2004).

I therefore investigate how nurses', doctors' and patients' sayings are instantiations of achieving social action (i.e. outcomes in the consultation) in the ED. This means I do not consider how these sayings relate to sociolinguistic considerations, such as how what they say convey interpersonal meanings, for example. Similarly I do not examine individual nurses' and doctors' capabilities in communicating, or their pragmatic communication strategies. In a few instances I examine misunderstandings with patients as examples of how information is misunderstood, lost in translation or negotiated in the ED.

2.4. What pre-practice theory (or conventional communication) research offers

I draw on some conventional studies that have researched team communication in relation to space, information and handover processes in health and ED settings (see, for example, Ayatollahi, Bath & Goodacre 2013; Cohen & Hilligoss 2010; Cooper *et al.* 2007; Eisenberg *et al.* 2005; Finn 2008; Hewett *et al.* 2009; Kilner & Sheppard 2009; Morey *et al.* 2002; Nugus & Braithwaite 2009; Redfern, Brown & Vincent 2009a, 2009b; Risser *et al.* 1999; Stein-Parbury & Liaschenko 2007; Woloshynowych *et al.* 2007). These studies address current understandings of, and approaches to, issues relevant to ED work, that in a practice theory approach impact on knowing. These include aspects of teamwork, information-seeking practices, general features of ED work, error reduction and safety and finally, communication links and patterns in the ED.

Below I outline some of these and others that I have drawn on for this thesis.

Interactional studies

I have found some aspects of Conversation Analysis (CA) and its methodological perspectives useful for the investigation of ED work. For conversation analysts, social structure is reproduced interactionally, and sayings are understood functionally as a doing, in the same way that Gherardi understands discursive practices (2008). I have found the particular focus of CA on the sequences of talk and conversation in medical and other settings to be useful in considering the sequences of talk in the ED. CA theorists, as has this thesis, draw on naturally occurring language to understand more deeply social dynamics in authentic settings.

> Within CA and ethnomethodology, talk is social action and the related question –
> 'Why that now?' (Schegloff and Sacks 1973, Schegloff 1997) – is crucially relevant
> for participants (not just for analysts) in any interaction (Sarangi & Roberts 1999b,
> p. 29).

I have also drawn on some of the concepts outlined in the work of Heritage and Maynard (2006) and Silverman (2006) in hospital and medical settings. Their methods of data collection are the same as the ones I have utilised in this study; these include audio-recording naturally occurring language and examining sequences of conversation. They too are interested in how 'communication work[s] out in practice' (Silverman 2010, p. 126). Heritage and Raymond examine social interaction, particularly how interlocutors index socio-epistemic authority through conversational strategies and language (Heritage & Raymond 2005). I have found this idea useful in the analysis of the ED consultations. First, the idea of indexing epistemic authority through conversational strategies and language points to how prior (and or superior) knowledge is enacted in social settings through interactional sequences, grammatical syntax and word choices. Secondly, in considering the way that talk occurs between nurses, doctors and patients, each is capable of enacting authority (or knowledge) through sayings and when this happens, as shown in the data, it circumscribes disciplinary knowing. This, in turn, can impact on safety and the quality of experiences for patients.

While the CA legacy in healthcare has been significant these studies have not traced the complexities of knowing in practice, throughout one ED consultation, by taking into account the panoply of contextual elements that impact on the sequential and iterative nature of interactions with patients and each other as colleagues in this unique institutional

setting. I identify the sequences of interactions (between nurses, doctors and patients) as important activities in the way that nurses and doctors achieve their own social actions through parallel practices, but I have not undertaken a CA analysis. Instead, I use LE – a linguistic theoretical perspective which I introduce in detail in Chapter Three – to track the sequences of interactions with patients, enacted by nurses and doctors. That these interactions occur in parallel (nurses' interactions alongside – even sometimes at the same time as – doctors' interactions) highlights how their parallel practices are enacted in the ED and how members of each discipline achieve their unique disciplinary agendas. LE also highlights the patterns of my two case study patients' interactions, revealing their 'hidden' practices, for example, how their involvement in their ED consultations fluctuates at different stages and over time (see Appendix 5).

Information seeking/learning studies

I also draw on Reddy and Spence's (2008) and Paul and Reddy's (2010b) work. They address communication in healthcare as an information-seeking practice. Their work has been especially informative to the analyses undertaken in this thesis in Chapter Six. Their early study identified that doctors and nurses collaboratively resource their knowledge as a deliberate strategy of their work, what they call 'collaborative information seeking' strategies or CIS. Reddy and Spence agree that teams are divided along disciplinary lines but show that nurses and doctors will seek information from each other when they feel they need it (2008). They identify differentiated reasons for interprofessional cooperation. According to them, clinicians' information-seeking is driven by specific areas of information need and include – in this order – patient-specific information, organisational information, information on the plan of care, miscellaneous information, the need to find out further details, and finally, information that is teaching and medication related (Reddy & Spence 2008). They identify interprofessional cooperation although other more recent studies I draw on, and my data, suggest that teamwork continues to be challenged by disciplinary boundaries and understandings (Creswick & Westbrook 2008; Creswick, Westbrook & Braithwaite 2009; Paul & Reddy 2010b). Reddy and Spence's findings of a deliberate strategy for information seeking provides a contrast to the conclusions of other researchers who identify that nurses and doctors liaise opportunistically in particular spaces as they talk or bump into colleagues in corridors or in the backstage of work (Ellingson 2003; Long, Iedema & Lee 2007).

Space and communication studies

As the ED space, its objects and material arrangements are central to the findings of this thesis, my analyses have included the role of objects and other semiotic systems in the ED, identified in pre-practice research by Drew and Heritage (1993). They make a case for incorporating the role of objects and doings in the analysis of the way that hospital care is understood and contend that patient records, non-verbal interaction, and action are also important. I have addressed nurses' and doctors' use of objects (as key to understanding practice). I understand objects as situated knowledges that interrogate the doings, sayings and beings of ED clinicians (Gherardi 2009; Hindmarsh & Pilnick 2007). By this I mean that objects call to mind actions. I investigate doings, sayings and beings both backstage and frontstage (Goffman 1959) in an endeavour to take into account the full contextual landscape of practice. In particular, Ellingson's work (2003) has been useful. She identifies how teamwork in healthcare is a blurring of backstage and frontstage and this has informed the way I have understood the knowledge networks in the ED, i.e. how knowledge is done collectively (Gergen 1985). Backstage/frontstage activities are always connected to each other in the ED. While clinicians are away from the bedside, patients are left alone, often for hours at a time; they are anxious about their health and they find themselves in an activity vacuum, i.e. without anyone attending to them. In contrast, for doctors and nurses, their time away from the bedside is busy: they undertake a range of activities, including having discussions about patients, taking lunch breaks, caring for other patients, chasing up previous notes, calling GPs or palliative care teams and so on. I have sought to take account of the complexity of practice by examining the way that objects elsewhere, diagnostic tests in a remote pathology laboratory, others not present at the bedside, and conversations away from the bedside, etc., make up the full contextual, artefactual networking of doctors' and nurses' knowing and their patterns of communication in EDs as outlined by Woloshynowych *et al.* (2007).

I also draw on Sarangi and Roberts who identify that '[f]or researchers, a competent understanding of members' communicative practices relies on analysts' involvement in a range of data sites around the institutional 'theatre'' (1999b, p. 24). Their seminal book (and their introduction to that book) in the late nineties, *Talk, work and institutional order: Discourse in medical, mediation and management settings* (1999a, 1999b) could be considered a precursor to more in-depth practice research in health settings such as proposed in this thesis. This is

because these authors are among the first to investigate communication in a broader landscape of practice and institutional care.

For example, first they trace the development of sociolinguistic literature in institutional settings, much of which they identify as having been conducted in healthcare. They identify a further distinction here of two principal approaches to the study of language in healthcare: 1) studies interested in the interaction order (communication between individuals) and 2) studies interested in the institutional order (explained above). Sarangi and Roberts also identify the interplay of four components in understanding healthcare communication and work: 1) the institutional order, 2) communication, 3) clinical activities and 4) clinician-patient relationships. They and other authors in this edited book emphasise the relationships between patients, clinicians and the institution.

Sarangi and Roberts identify that the majority of sociolinguistic studies in healthcare settings are interested in the interaction order not the institutional order, with some also focusing on 'the asymmetrical power relations; patterns of lay-expert information exchange; discursive representation of health, illness, normalcy, deviance etc.' (Sarangi & Roberts 1999b, p. 6). They outline how considerable work had been done (by the time they are writing) based on Erving Goffman's 'interaction order' (Goffman [1974] 1986; Heritage & Maynard 2006) in medical interactions, principally using CA, outlined above with its particular approach to the analysis of talk arising from the work of Sacks, Schegloff and Jefferson (1974), and subsequently adopted by other CA proponents (see Drew & Heritage 1993; Maynard & Heritage 2005; Silverman 2006).

Sarangi and Roberts identify that the majority of sociological studies in professional settings are concerned with the institutional order. According to them, 'many of these studies had been concerned, on the one hand, with the knowledge/power dimension and, on the other, with the interface of professions and the state' (1999a, p. 7). They cite a number of theorists in this domain (including Abbot & Wallace 1990, Freidson 1970, 1994; Johnson 1972, 1994; Larson 1977, Macdonald 1995 in Sarangi & Roberts 1999a). Exemplifying the diversity in approaches to communication, they and other researchers in that volume (see also Cicourel 1985; Hak 1999; Sarangi & Roberts 1999b) utilise a range of discourse and activity-based approaches to the analysis of clinical and communication practices in institutional settings.

With the ED consultation as the site of practising, I examine the wider 'theatre' of practice: the power relations between nurses and doctors, and between nurses, doctors and patients; the way tasks are a part of clinicians' work; and the way space and the magnitude of codified knowledge about patients precipitates (causes, results in) repetitive proximal visits by nurses and doctors to patients' bedsides. Sarangi's and Roberts' book sets the stage back then for exploring how space impacts on care and knowing, and how nurses and doctors network with each other across the ED space.

Although some studies have investigated the impact of material arrangements and objects (including space and time) on care and communication (Coiera *et al.* 2002; Crawford & Brown 2011; Engestrom 2008; Hobbs 2007; Woloshynowych *et al.* 2007), from a practice theory perspective, space, time and objects are interconnected with knowing and not knowing and these aspects of work are understood as disciplinary and institutional arrangements that prefigure communication. Nurses and doctors do communicate with each other in the chaotic environment of the ED, but knowing is constrained by this setting's institutional, disciplinary and material arrangements. Existing research rarely addresses how these factors impact on the way nurses and doctors communicate and work in teams *in actu* when staff, patients, notes and carers are nomadic and ephemeral or when knowledges are contested across disciplinary lines. Engestrom does warn that interprofessional relationships are not yet ready for this new (de-centred and mobile) world of healthcare. In his words,

> the shape and implications of spatio-temporally distributed work and expertise are still fragile and open, literally under construction. When professionals perform such work and discourse, they also give shape to it (2008, p. 217).

Team rivalry studies

Studies that I found informative for understanding interprofessional rivalries (and consequently learning) include Sheehan *et al.* (2007) who identify medical teamwork as a site of professional turf battles. Sheehan *et al.*'s findings contrast with Lingard *et al.*'s (2002), presenting a more nuanced picture of interprofessional work. Lingard *et al.* agree that medical teams maintain disciplinary hierarchies but their study argues that this is a complex picture, and interdisciplinary practice embraces good relationships as well. Lingard *et al.* therefore paint a complex picture of interprofessional relationships. I have also resourced research findings from Finn (2008) as she has considered the role of professional rivalry in

teams. She argues that teams can be seen as an ideological technology of compliance designed to maintain the hierarchical status quo of some clinicians. She argues that teamwork, rather than unifying the (health) professions, produces unintended divisions as each discipline pursues divergent professional interests. Each discipline constructs different versions of teamwork and each makes competing legitimacy claims for what they do and for what teamwork means. These claims both reflect and reproduce structural inequality between the professions.

Finn argues that teamwork, proposed as a 'key element of policy aspirations' (Finn 2008, p. 107), is generally portrayed as simply a matter of a negotiated outcome between (the specialised work of) health professionals. However, Finn argues, work between health professionals is a problematic, contested turf battle where structural (professional) inequalities abound. The tensions Finn alludes to, and the practices that divide nurses and doctors, have informed some of the analyses I present in Chapters Four, Five and Six.

In summary, pre-practice theory approaches to ED work and communication improvements to ED work emphasise an increased adherence to protocols (for example, standardising handovers, etc.), rules, checklists, better electronic patient recording, improvements to interprofessional communication, teamwork and better information transfer practices in the ED.

I will argue in the forthcoming chapters that these approaches to improving ED work, while important, continue to focus on individual and instrumental enactments of information transfer systems, rather than a deeper, more adaptable, self-modifying approach to understanding how knowing is done in practice.

2.5.   Concluding comments to Chapter Two

In Chapter Two I examined the background of communication, teamwork and knowledge transfer research studies in healthcare and how they have focused, and continue to focus, on ways that individual nurses and doctors communicate one-on-one with patients and with their colleagues interprofessionally to manage so-called stable forms of knowledge.

I posited that given macro healthcare reform and demographic health trends, these approaches to understanding communication and teamwork in ED work are insufficient

and inadequate to manage safety and the quality of patients' experiences in what is an increasingly complex and pressured work setting.

I then introduced practice theory as an approach enabling a different understanding of knowledge and information transfer from that traditionally adopted in healthcare (Nicolini *et al.* 2008). A practice approach, I argued, locates ED work in a complex, historical framework of medical and nursing practice and shifts away from a focus on individuals' communication, teamwork and/or information transfer or communication management capabilities.

I outlined how I have drawn on a number of theorists and several research studies that have focused on some of the aspects of a practice theory approach, including those that address spatial, institutional and interactional aspects of communicating and their relationship to knowing.

I now examine in Chapter Three the epistemological and theoretical perspectives of the study and the methods I employed.

Chapter Three – Theorising new practice research methodologies

Purpose and flow of this chapter

In Chapter Three I introduce the epistemological framework under which practice theory and linguistic ethnography (LE) are located. I situate the research within an epistemology of constructivist/interpretivist traditions of social research. I substantiate the methodological approaches used, quasi ethnography and LE, as suitable for examining practice(s).

I present a research design that focuses on a full ED consultation as the basis for investigating practice. I explain how this allows the analysis of 'a practice [singular] from its beginning to its end' (Bruni, Gherardi & Parolin 2007, p. 91). I then present the methods I used for collecting data, which include audio-recording consultations, interviewing clinicians and non-participatory observation of ED work.

I justify the selection of two case study patients whose consultations I analyse drawing on the audio-recorded transcripts and field notes from which I use to develop:

- knowledge networks; and
- a practice/LE matrix.

These analytical tools facilitate an understanding of practising and knowing as networked, activity-based and situated undertakings.

I conclude Chapter Three with a brief overview of the study's ethics and a discussion on methodological issues and limitations.

3.1. Epistemological and theoretical perspectives

According to Hamlyn, epistemology deals with 'the nature of knowledge, its possibility, scope and general basis' (1995, p. 42 in Crotty 1998, p. 8). This thesis examines the way knowledge is understood in the ED, and in so doing relies itself on an epistemological perspective to understand and interpret ED work. In qualitative research, epistemology, theoretical perspectives, methodological approaches and methods form a cascading set of compatible elements (Crotty 1998). This study:

- adopts an interpretivist/constructivist approach to understanding ED work;
- uses practice theory as its theoretical perspective;
- draws on ethnographic and LE approaches; and
- uses methods consonant with paradigms of understanding the world through these paradigms.

Each level of these research facets supports the next, in order of its nested relationship.

In relation to the first point above, this study adopts a constructivist approach to understanding ED work. An interpretivist/constructivist approach does not recognise an objective truth out there in the world waiting to be discovered. This means that meanings I derive from my study arise from my engagement as a researcher with the actualities of ED work, as interpreted: knowing as social practice. This is consonant with the theoretical perspectives of practice theory, and methodological approaches of quasi ethnography (and LE), which rely firstly on observation and then on analysis and interpretation.

Seeing and representing ED work fits in with what Yanow calls 'an interpretive epistemological perspective… [one] that posits that scientific perception is mediated by the theoretical constructs that researchers bring to their observations' (2000, p. 248). Yanow states that 'seeing a practice – a set of acts and interactions involving language and objects repeated over time, with patterns and variations (2000, p. 249), allows the researcher to infer back that a culture of practice exists.

Although Yanow's reference to 'culture' suggests a traditional view of ethnographic methodologies for investigating cultural norms and mores as visible and describable, this is always done subjectively, or by someone. Yanow's views on seeing the culture of a work setting – through observation, a conventional ethnographic methodological approach – is appropriate for getting into and then trying to understand the world of others and how they make meaning. This is a considered choice in organisational research and combines well with LE approaches.

The qualitative and interpretive dimensions of investigation assume 'a socially constructed reality that is never objectively or unproblematically knowable and [bring with them] a researcher whose identity and values are inevitably implicated in the research process' (Greenhalgh *et al.* 2009). Thus, interpretation is filtered through theoretical perspectives afforded by practice theory, and conducted through methods that are always selective. The

study therefore presents a 'representation' of practice, and like all representations, it is taken from an observational standpoint using particular terminology, observational categories and textual elements. Towards the end of this chapter, I outline the limitations of this constructivist/interpretivist perspective.

Practice theory, introduced in Chapter Two, is a theoretical perspective within the constructivist/interpretivist paradigm of social (and/or cultural) research. Practice theory itself, however, is not necessarily understood from a single perspective. Reckwitz (2002) identifies several practice theorists, such as Bourdieu, Giddens, Foucault, Garfinkel, Latour, Taylor and Schatzki, who have each approached notions of practice(s) differently. Schatzki, for example, takes a more philosophical approach in his theorisations, seeing life as ontologically social (2001a), explained in Chapter Two. Therefore an organisation (such as the ED) is spatio-temporally ontological (2009), i.e. the nature of the site – its practices and material arrangements – are socially, materially and teleologically learned, derived and perpetuated. These practices and arrangements are not necessarily fixed, but are determined by goals of human activity (Schatzki 2002). Change and stability are inherent in the ongoing (re)production of knowledge in the site; the organisation is always simultaneously becoming and staying the same (Schatzki 2011).

Reckwitz locates practice theory within the paradigm of what he calls 'cultural theories' as distinct from 'social theories', which he says centre on either individual (homo economicus) or collective norms (homo sociologicus) to explain human action and social order (2002, p. 245). He too recognises that practice theory is constructivist. He says that what practice theorists have in common is that they all have recourse to symbolic structures of meaning – reconstructing the symbolic structures of knowledge – which enable and constrain agents to interpret the world according to certain forms, and to behave in corresponding ways. He points out that practice theorists differ from each other in how they construct and understand (or emphasise) ideas, body, mind, things, knowledge, discourse, structure/process and the agent, i.e. people or things.

Reckwitz distinguishes practice theory from *other* cultural theories such as mentalism, textualism and intersubjectivism because practice theory 'does not place the social in mental qualities, nor in discourse, nor in interaction' (2002, p. 249) which other cultural theories have done. According to Reckwitz, '[p]ractice theory 'decentres' mind, texts and conversation. Simultaneously, it shifts bodily movements, things, practical knowledge and

routine to the centre of its vocabulary' (2002, p. 259). '[Practice theory] places the social in 'practices' and treats practices as the 'smallest unit' of social analysis' (2002, p. 249).

I acknowledge the different scholarly perspectives of the key practice theorists I draw on, which in one sense serve as a proxy for modelling the complexity of ED work I seek to address in this study. I draw on Gherardi, a sociologist of work; Schatzki, a philosopher of social science; Pickering, a sociologist of science; and Reckwitz, who studied sociology, philosophy and political science, to approach the analysis of my data (Johnsson, Price & Manidis 2013). Gherardi is central to understanding the institutional and learning aspects of the ED; Schatzki with understanding the ontological timespace of the ED and its (human) teleoaffectivity; Pickering with grasping the mangle of practice; and Reckwitz's cultural/social understandings with examining collective ways of working in the ED.

3.2. Methodological approaches to researching practice

Gherardi sees the study of practice in work settings through observation, as a methodological approach in and of itself. She explains that once we accept practices as site specific, we have situated 'seeing, saying and doing' taking place (for workers) and for researchers, a 'field of empirical analysis' (2008, p. 520). The worksite, the doings, sayings, beings and seeings there (what workers see their colleagues doing) can be methodologically (empirically) understood as knowing in practice. This means that, for her, knowledge can be analysed and interpreted,

> as an empirical and observable phenomenon, on the assumption that in order to
> perform a work practice, the context, the collectivity, the tools and technologies,
> and language are the resources at hand for purposive action (2008, p. 522).

Gherardi adopts an organisational theoretical perspective on practices, which she observes using ethnographic approaches, from which she then interprets practices. For Gherardi and others, practices are not directly visible (Corradi, Gherardi & Verzelloni 2010; 2006). It is therefore not necessary to posit the logical primacy of either the actors, or the context, or the material world (or tools/technologies), or language. 'Practical knowledge in situation' for Gherardi is given and then (re)created by more weaving of contextual knowledge, involving material and social orders: this results in work practices. What is important methodologically are the connections of the practitioners in the community, whose work practices are 'social and material accomplishments' (2008, pp. 522-3).

Nicolini, a close colleague of Gherardi, describes a number of 'theoretical tributaries' (2009, p. 1393) as formative influences in his approach to examining practice: this results in a composite methodology. First, he says he draws on Wittgensteinian and Heideggerian traditions, which, according to him, 'allow [researchers] to decentre such phenomena as mind, meaning and intentionality, so locating the roots of social co-existence in the practices that all people *qua* humans are necessarily involved' (2009, p. 1393). Nicolini then draws on ethnomethodological approaches, seeing actors' views of what they do as significant. Finally he utilises considerations from Cultural History, Activity Theory (Engestrom 2000) and Actor Network Theory (ANT), examining the way that practices 'embody different interests and are hence internally fragmented, subject to multiple interpretations, and open to contradictions and tensions. This, in turn, makes all practices necessarily tentative and ever-changing' (2009, p. 1393).

Nicolini discusses his overall approach to collecting data as 'ethnographic and interpretive investigation' (2009, p. 1393). But in the detailing of his methodology, he identifies sub-ethnographic approaches, including 'focused ethnography (Knoblauch 2005) and micro-ethnography (Streeck and Mehus 2004)' (2009, p. 1393). The former allows him to examine the same practice in different locations while the latter allows him to detail the accomplishment of a particular practice.

Why an ethnographic approach?

I adopted an approach that combined ethnographic and LE, the latter nested within the former. Combining methodological approaches is not uncommon in qualitative research. According to Denzin (1997), in undertaking qualitative research, researchers engage in interdisciplinary, transdisciplinary and sometimes counterdisciplinary fields. Denzin outlines that qualitative research can cut across the humanities, social sciences and physical sciences and can be many things at the same time involving a number of methodologies and methods. Mackenzie and Knipe (2006) refer to this as 'pragmatist' research, an approach that 'places 'the research problem' as central and applies all approaches to understanding the problem' (Creswell 2003, p. 11 in Mackenzie & Knipe 2006, p. 197).

I favoured an ethnographic approach because it allows theoretical ideas to emerge and does not prescribe particular hypotheses. This was important in my study, as I developed a

deeper understanding of practice in the ED, which allowed me to progressively refine my research questions.

Defining my ethnographic approach provided a challenge. Ethnography is not a unitary methodology, nor are its methods of observation or involvement with participants unitary. Thus, ethnographic approaches are not always consistently used generally, neither so in practice theory studies but they do offer a way to examine situated practices through observations (Kemmis 2005b). Examples of how approaches can vary are included in Table 2. In the table, Kornblauch (2005) distinguishes between aspects of what he calls 'conventional ethnography', originally designed for anthropological studies, and 'focused ethnography', more attuned in his view to sociological study:

Conventional ethnography	Focused ethnography
long-term field visits	short-term field visits
experientially intensive	data/analysis intensity
time extensity	time intensity
writing	recording
solitary data collection and analysis	data session groups
open	focused
social fields	communicative activities
participant role	field- observer role
insider knowledge	background knowledge
subjective understanding	conservation
notes	notes and transcripts
coding	coding and sequential analysis'

Table 2:   Comparison between conventional and focused ethnography (Kornblauch 2005, sect. 4)

These categories are presented as binaries; however, the terms are relative and are not mutually exclusive. For example, in my study, I drew on identified activities across the categories listed separately, examining 'communicative activities' and 'social fields', engaging in 'subjective understanding' and undertaking both 'solitary data collection and analysis' and 'data session groups'.

Adopting Yanow's perspective on 'seeing practices' (2000, p. 249), I saw the ED as a cultural, social and organisational world, which is what an ethnographic approach does best, i.e. providing tools for making sense – albeit subjectively – of a culture, of ways of doing, ways of being and ways of saying. By closely observing the details of what people do, it is possible to describe what people are doing, provided, as outlined above, the unit of analysis of practices has been decided on (Green 2009b).

Why a linguistic ethnographic approach?

Nurses' and doctors' sayings – their discursive practices – are an important analytical focus of this thesis. Sayings remain one of the most accessible ways to examine practices *in situ*. This premise is recognised by researchers adopting different methodological approaches including ethnographers, ethnomethodologists and symbolic interactionists who agree that much 'social action is accomplished through talk' (Yamauchi 2006, p. 14). In her ethnographies of work, Yamauchi outlines that sayings provide interpretive understandings as '[e]thnographers can learn so much by simply transcribing and examining interactions' (Yamauchi 2006, p. 14). Knowledge is enacted through sayings, what Bruni *et al.* term 'material-discursive practices' (2007, p. 87). Sayings and interactions (as interpreted) reveal not only what people think, but also how local social action is accomplished.

I use LE to understand how doctors' and nurses' sayings accomplish social action as a 'backstage' activity.[11] For example, by examining how doctors' and nurses' sayings occur in parallel practices (coded differently, which I explain below) this analysis illustrates how each discipline in the ED pursues its own disciplinary agendas alongside the other. Focusing on the backstage does not mean I am not interested in what doctors and nurses are saying to patients (although I do examine some instances of this) but by focusing on how their discursive sayings are aligned in parallel, LE has proven its 'capacity to lay bare and attend to practices which easily remain unnoticed' (Jacobs & Slembrouck 2010, p. 236). LE may not be unique in its capacity to do this, but because it sanctions divergent analyses of what is going on with sayings in the institution, I believe it takes an unfettered approach to examining how sayings shape, and are shaped by institutions: LE allows researchers to investigate what is of interest to them. For example, 'LE's capacity to provide an emic and etic view of what is going on' allows one researcher (Richards (2010)) to examine staffrooms, not classrooms and others, namely,

> Van Hout and Macgilchrist […] to keep track of the backstage processes of text editing when they introduce new 'fly on the wall' technology which allows the ethnographer to monitor journalistic writing processes by tracking each and every mouse click and cursor movement (2010, p. 237).

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[11] The sayings of nurses, doctors, patients and others in the consultations have been transcribed. I consider these sayings as linguistic data.

Through the language focus of LE, supplementing the contextual understandings afforded by ethnographic observations, I obtained a deeper understanding of how the social action and knowledge (re)production unfolded in the ED. I have also found it useful and consonant with practice theory as LE takes a praxeological view of sayings.

An LE approach views context in the vein of recursive and interpretivist research traditions, which is consistent with my overall interpretivist/constructivist approach to the doings, beings and sayings of doctors and nurses, and one in which the field of practices is interconnected contextually.

Using LE analyses for this study highlights how nurses', doctors' and patients' sayings relate to each other in their professional roles: whether they occur alongside each other or in sequence. Although this would reflect a normal adjacency pair structure (conversational turn-taking) LE enables me to illustrate in the practice/LE matrix how nurses', doctors' and patients' sayings concentrate at different times of the consultation. The successive visits to patients' bedsides where nurses and doctors talk to patients occur because patients are located in beds dispersed in the clinical space of the ED. LE analysis connects space, talk and clinical practice through these visits, and these are activities that (re)produce knowledge. LE sees sayings as *actions* (that underpin *activities*, e.g. history taking, which themselves underpin *practices* of medicine and nursing, e.g. how medical and nursing knowledge is enacted through differential diagnosis, power relations, etc.), and as such this aligns with a practice-based approach to understanding sayings in medical and other work contexts.

I have found LE, particularly how, to be consistent with the theoretical perspectives of practice theory, it promotes an

> increased awareness of context… with a consistent focus on processes rather than products… and [how it goes] hand in hand with a growing interest [in] the professional conduct of people who go about their daily routines (Jacobs & Slembrouck 2010, pp. 240-1).

The interactional sequences (actions and activities) with patients illustrate disciplinarily and institutionally the practice of how ED knowledge is (re)produced. My own interest in *Why that now* explores how nurses' and doctors' visits to patients' bedsides reflect the sayings, beings and doings as contextually determined by a number of factors, including, but not limited to, the material arrangements (dispersed beds in space, mobile objects and mobile

clinicians), the organisational exigencies of the ED, and the need to engage proximally with patients and participate with them through talk. I focus on the iterative questioning of patients by nurses and doctors (for example, about pain, their allergies, etc.) to investigate how nurses and doctors work with information about patients and their colleagues individually and collectively.

LE places a particular emphasis on the ethnographic features that surround or precipitate talk in the ED setting. As I represent sayings of nurses and doctors in the data chapters, LE has enabled me to focus on the processes of talk in the ED through the practice/LE matrix (i.e. the repetitions, the number of times doctors and nurses talk to patients as they reconstitute their knowing, the locations of talk – where and how talk and text happen) as well as the products of talk (i.e. the content of conversation between doctors, nurses and patients and between themselves, e.g. iterative questioning about allergies, pain, etc.). I examine how visiting patients' bedsides, comprising talk and clinical actions, is organised as a sequential activity in progressing nurses' and doctors' knowing and the patient's care. Creese (2008, p. 232, drawing on Rampton *et al.* 2004) identifies how sayings and contextual features of the ED (for example, its noise, space, time, objects and equipment) inform the way that the iterative visits to patients' bedsides and iterative engagements with patients take place:

> [e]thnography provides linguistics with a close reading of context not necessarily represented in some kinds of interactional analysis, while linguistics provides an authoritative analysis of language use not typically available through participant observation and the taking of fieldnotes.

As I spent over 300 hours in five different EDs, with approximately 114 hours at patients' bedsides, I understood the context of the ED as significant (the noise, space, time, material arrangements) in the way it shaped doctors' and nurses' sayings at their bedsides.

> Ethnography (in linguistics research) stresses the importance of observation and participation in speech situations and presupposes that the person undertaking the research into such events will either be a long-time observer of a communicative episode or an ongoing participant in an event (Roy 2000 in Dickinson 2010).

My etic non-participant 'gaze' was directed at the doctors' and nurses' practices and the way their doings, sayings and beings were connected to the institutional and disciplinary exigencies of the ED.

I resolved that the observational space of an ethnographic (and linguistic ethnographic approach) provided me with both etic and emic perspectives of patients' experiences and clinicians' practices – stances seen as important for linguistic (and other) ethnographers. The length of the study (over four years) and the time I spent in EDs and at patients' bedsides strengthened my emic perspectives of the consultations and the impact that iterative questioning was having on patients (precipitated by space, time, multiple staff, etc.). Patients frequently told me – even though I was there as a non-participant researcher – how they were experiencing the multiple visits and iterative questioning by doctors and nurses. This complemented my etic perspective of non-participant observation, afforded by my stance as an outside researcher observing these multiple visits, sayings, doings and beings.

Nicolini (2008), Gherardi (2008) and Schatzki (2006) all see ethnographic methodologies as suitable for undertaking empirical studies of practice and this methodological/theoretical compatibility is a pre-requisite as

> [a]ny method always goes with a theory. Method and theory cannot be separated, despite the fact that methods are often taught as if they could stand alone. Any method of research is a way to investigate some particular domain… There can be no sensible method to study a domain, unless one also has a theory of what the domain is (Gee 1999 in Gillen 2007).

Most practice theorists utilise methods that pay close attention (through both non-participant or participant observation and audio-recordings of naturally occurring speech or interviews) to sayings, and therefore by implication, adopt ethnographic and/or ethnomethodological methodological approaches. Many researchers undertaking organisational studies also utilise (quasi) ethnography as a methodological approach as it allows researchers to closely observe work *in situ* (Fenwick 2008; Orlikowski 2002; Orr 1996; Yanow 2000). Organisational researchers' observations are frequently supported by interviews, documents (texts from the workplace) and spoken interactions (sayings in practice theory terminology), all of which they draw on to interpret how individually or collectively individuals in the organisation learn, and how the organisation itself operates and changes (Lave & Wenger 1991; Orlikowski 2002) and (Pentland 1992 in Yamauchi 2006, p. 76).

3.3. Methodological design – an innovative approach

In combining practice theory, ethnographic and linguistic ethnographic approaches, through the practice/LE matrix, the stages of the consultation – how the organisation itself operates and changes – is made visible. This would have been possible with quasi ethnography alone, but by colour coding those who interact with my patients (see below), LE has highlighted how nurses', doctors' and patients' sayings concentrate at different stages of the consultation – outlining how the consultation itself, nurses, doctors and patients (their involvement) go through disciplinary and institutional patterns and processes.

I explain the practice/LE matrix and knowledge networks (as analytical tools) in the methods sections (3.7 and 3.8) below as combining practice theory, ethnographic and LE approaches. These tools have facilitated an understanding of knowing and practising as networked, activity-based and situated undertakings. These understandings and the visuals from these analyses, have in their turn afforded insights into the meta-disciplinary and institutional framework, capturing the collective practices of how nurses and doctors know in practice in the ED.

3.4. Research design – the ED consultation

In Chapter Two I introduced a focus on the consultation as a key feature of my investigative approach. In analysing knowing in practice, I seek to view the consultation in its entirety, drawing on the practice of doing an entire consultation, as a key focus of situated knowledge and knowing. I also draw on the notion that nurses' and doctors' practices in the ED consultation have prevailed from those enacted in prototypical GP consultations into the ED, the prevailing nature of which illustrates the significance of this practice for nurses and doctors (Schatzki 2002). In a standard medical interaction, an individual doctor or nurse, in one room, talks to a patient about their illness. Both parties in the interaction are usually geographically co-located, they often know each other well and although there can be other mediations involving objects such as thermometers, patient notes, computer screens (Greatbatch *et al.* 1993), as well as very complicated topic shifts and language interactions, these consultations are generally short and usually involve no more than two people, i.e. they are dyadic.

Standard medical interactions are generally spatio-temporally and diagnostically linear although more complex analyses show that they too can be very complex undertakings (Mauksch *et al.* 2008; Mishler 1984). Linguistically, these consultations contain endophoric references (internally referenced talk) that both the doctor and the patient are cognisant of, having just discussed a particular symptom/process or illness or pointed to an X-ray in front of them. Knowing between the doctor and the patient is an individual, one-on-one affair, although increasingly this is extending to involve many others in continuity of care sequences of tests, screenings, etc. (Rogers *et al.* 2005; Safran, Miller & Beckman 2006; Wynia 2012).

Although the ED consultation has sought to maintain some of the essential features of a standard medical interaction (or a prototypical GP consultation), such as its diagnostic linearity – a patient comes in, they go through fixed stages of care in which they are questioned, examined, treated and then they leave – it is very different from a consulting room consultation. EDs themselves are busy, complex and high stress healthcare environments. Patients are set up to be triaged, medically assessed, cared for and treated, diagnosed and then discharged by a team of clinicians in a staged flow of activities, designed to move them through the ED safely and quickly.

Unlike a one-on-one encounter with a medical or nursing professional, the ED consultation, still largely conducted proximally through the spoken word (Ayatollahi, Bath & Goodacre 2013) and bodily (clinical) doings and beings, brings together one patient and multiple clinicians, in a rapid and mobile organisational healthcare setting. A single patient will see multiple clinicians in one episode of care. Each new clinician's visit to the patient's bedside begins a new encounter, where often old ground is covered, repetitive information is sought, e.g. whether or not the patient has allergies, and knowing is constituted and reconstituted again and again with the patient. Some nurses or doctors may refer back to earlier discussions with other clinicians or with the patient themselves; some even remember what has gone before.

By focusing on the whole ED consultation, I seek to highlight the complexity of the ED consultation in contrast to the prototypical GP consultation, through an analysis of its contextual features – ones that practice theory attends to – such as the interconnectedness of material arrangements (space, things, objects), time, people and language. This renders the organisational features of the ED consultation visible. These features differ markedly

from those in a prototypical GP equivalent. In seeing the consultation in its entirety, as a set of multiple, interwoven, bundled, interconnected and emergent events, it is possible to see the social relations, space, time and material arrangements involved in working and knowing as this consultation is enacted.

In Figure 1 below, I superimpose the linear doctor-patient consultation over the multifaceted and multidimensional process of an ED consultation involving multiple interactions, doings and beings – a consultation that is now *organised* into various stages of care. The straight line in the figure indicates the trajectory of the consultation with arrival and departure points. At this macro level, the ED consultation is envisaged as up to a '4-hour' diagnostic event as outlined in policy requirements and implemented increasingly across Australia (Geelhoed 2012). The jagged zigzag pattern in Figure 1, with multiple lines, represents the repetitive 'unfolding of performances and material events' – the rhythms and patterns that occur 'as [care] happens' (Schatzki 2006) – in the ED at the micro interactional level of care with each patient.
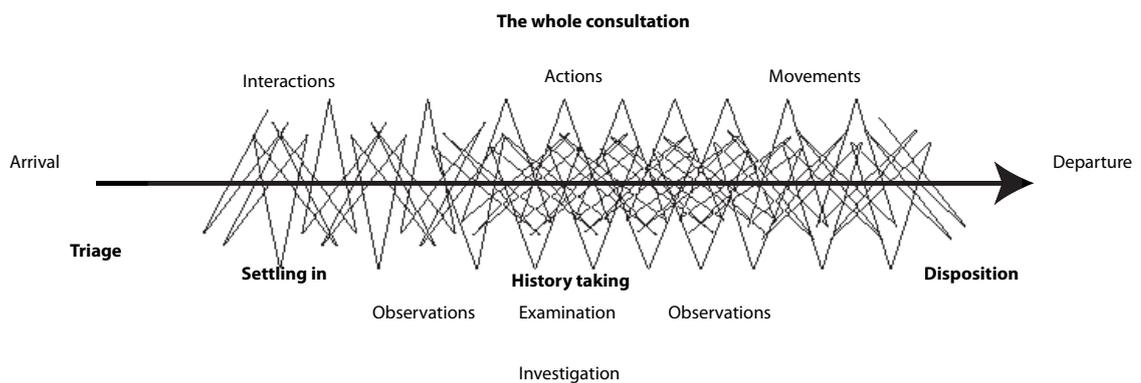
Figure 1: An organisational view of the ED consultation as a diagnostic event

I came to see these multiple interactions, actions and movements with patients as reflecting sequential 'event[s] in a flow' (Hak 1999, p. 433) of each clinician's and multiple clinicians' work amid the ongoing life of the ED. Consultations were interspersed with noise disturbances, tea ladies bringing sandwiches, moves to radiography, and moves to the toilet and elsewhere – spatial, material, relational and linguistic happenings involving collective working and knowing.

Knowing in this consultation is understood as activity – and a key component of knowing in practice in the ED involves iterative sayings and doings with patients – as nurses and

doctors conduct a micro medical (and nursing) interview each time they talk to them. Such an interview is a task that cannot be delegated (Simpson *et al.*1991) and it is one embodying 'regimes of familiarity' (Zukas & Kilminster 2012, p. 207) for nurses and doctors. In the ED consultation each nurse and doctor interacts with each patient, one-on-one (occasionally this involves interacting with a carer or family members), iteratively, as they reconstitute their knowing.

3.5.   Methods for collecting data

The principal methods I used to collect my date were audio-recording of patient-clinician consultations and non-participant observation.[12] I used only a few interviews from the larger ARC study[13] and similarly only a few documents and texts from the ED. Although organisational researchers' observations are frequently supported by interviews, documents (texts from the workplace) and spoken interactions, all of which they draw on, for example, to interpret how individually or collectively individuals in the organisation learn, and how the organisation itself operates and changes (Fenwick 2008; Orlikowski 2002; Orr 1996; Yanow 2000), I have not used interviews and documents extensively (which I discuss further below).

The methods for collecting data were consistent with ethnographic and linguistic ethnographic approaches. I was inducted into procedures for obtaining key data from patients' consultations – audio-recording the consultations, and doing the ethnographic observations (see Appendix 3) through my involvement in the ARC project. Prior to starting the study, I met with senior ED staff and outlined the way I would go about the research with them. Staff agreed to have their consultations with patients recorded (although they had an opt-out option) and they also agreed to participate in either group or individual interviews. I attended EDs day and night and at different times of the week, to ensure a spread of observation during seasonal, weekly and diurnal/nocturnal peaks and troughs.

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[12] Although I began observing as a non-participant, on many occasions I (and other researchers) participated in practice as patients and clinicians involved us in care and work.

[13] This study was one of the largest of its kind conducted in Australia and by the study's completion, a total of 526 hospital staff had been captured on the audio-recordings. The project yielded over 700,000 words of transcribed consultation interactions.

From mid 2006 to 2009, I undertook the following data collection activities:[14]

- interviewing doctors and nurses using semi-structured questionnaires (see Appendix 3) to ascertain their views on work in the ED, the way that communication worked in the ED and the problems of communication in the ED. I conducted 127 of these, either jointly with colleagues or singly;

- audio-recording 'naturally occurring' speech between doctors, nurses and patients. These included non-acute patient consultations including English speaking and non-native English speaking male and female patients; I audio-recorded 30 of these consultations;

- observing the contextual features surrounding this naturally occurring speech using semi-structured observation sheets (see Appendix 3). This included hours of attendance in the EDs (and in other spaces in the hospital on occasion). I completed over 300 hours of attendance at the five EDS and spent approximately 114 hours at patients' bedsides.

Interviewing doctors and nurses

Semi-structured interviews included ones with emergency nurses, doctors, physiotherapists, radiographers, communication clerks, wardsmen, ambulance officers, department and disciplinary managers, social workers, ED directors, nurse educators, doctor educators and others at the EDs of my case study patients. I have not incorporated data from the staff interviews extensively into the narrative of the thesis, as my focus has been on the sayings *within* practices and not the sayings *about* practices. Although talk on practices is a major contributor to how practices are maintained and regulated (Gherardi 2006), I was more interested in the actual doings, sayings and beings of nurses and doctors than in what they said about their doings and sayings. I wanted to focus on how the consultations (re)produced emergency healthcare knowledge *in situ*. However, on occasion I do refer to pertinent statements that nurses or doctors make about the ED, its communication systems and/or their patients based on their interviews.

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[14] The overall study undertook 150 ED staff interviews; audio-recorded 82 patient consultations in total and conducted over 1,000 hours of general ED observation with 242 hours of direct bedside observation.

Audio-recording the consultations

My data analysis is based on the audio-recordings for the two case study patients, Jane Edna and Joel. Their consultations took place in two semi-metropolitan hospitals, i.e. located in large demographic catchment areas, but not in the city. On the days I spent with them, I arrived at the ED, introduced myself to the ED director on duty and then to other staff. In Jane Edna's hospital I was assisted by the triage nurse to approach her and the same procedure applied to Joel. Once I had identified Jane Edna and Joel as suitable (based on their age, triage category and their willingness to be involved) I stayed on my own with them for the duration of the consultation. As neither of them had appeared distressed or too ill, I was fortunate to obtain their consent to participate in the study, audio-record and observe them from the very beginning of their consultations, while they were both still in the ambulance bay. Once they agreed to participate in the study, I briefed them (and in Joel's case his wife Jill, who was there as his carer) about the study. Both Jane Edna and Joel were very willing to participate in the study in the belief that the findings would contribute to improved care.

I followed Jane Edna and Joel throughout their ED journey; in Jane Edna's case this was over 11 hours and just over four hours in Joel's case. As each attending nurse or doctor approached Jane Edna's and Joel's bedsides, during their consultations, I approached them (they had already been briefed about the project and greeted on the day) to ensure that they were still willing to be audio-recorded. For the remainder of the consultation I sat next to Jane Edna's and Joel's beds or stood in the consultation room as unobtrusively as was practically possible. On one occasion I left the room when Joel needed to use the bedpan; I also took a short lunch break during Jane Edna's consultation and was replaced by a colleague for that time.

Observing the context of the consultations

My non-participant observations were closely connected to audio-recording the consultations, and based on observation sheets (see Appendix 3). For example, throughout Jane Edna's and Joel's consultations I took field notes and audio-recorded each interaction with successive clinicians as they entered the bedspace and interacted with, or undertook clinical examinations or interventions with Jane Edna and Joel.

From the many hours I spent at patients' bedsides and my growing interest in the ethnographic context of the interactions, from a practice and linguistic ethnographic perspective, I recognised that the breaks, the noise, the people, the space and the mobility of all things in the ED, as much as the patient-clinician interactions themselves, were interconnected with the practices of the ED. The combination of interruptions and conversational re-starts, noise, movement, language and people – together – represented how knowledge was being (re)produced in the ED. Thus, from an ethnographic perspective, as I became more interested in the process of the interactions, not merely the content, I began to record the spatial and interactive aspects of the consultation:

- I noted when nurses and doctors left the bedside and returned;

- I recorded doctors' and nurses' absences in the field notes (and later on the transcripts, marked as 'D1 leaves' or 'N2 leaves'). I sought to ascertain where nurses and doctors went as they left the bedside – whether it was to find equipment, or patient notes, go on tea or lunch breaks, changing shifts, etc.;

- I noted each time the doctors and nurses returned to Jane Edna's and Joel's bedsides, that is, I counted each *new* visit to the bedside by the same nurse or a doctor. In my field notes, I marked these as 'D1's 4th visit' or 'N4's 3rd visit';

- I also noted any visits to the bedside by a new nurse or doctor;

- I counted the frequency of fire alarms drills; how often and whether or not these impacted on the conversation;

- I counted how often the patient was moved and what acoustic and spatial interruptions meant for the sequence and content of the interactions with the patient;

- I documented how often Jane Edna's and Joel's doctors or nurses were interrupted while at the bedside; and

- I noted how frequently doctors and nurses were called away.

These field note observations and recordings became central to the analysis of practices. Some gaps when doctors or nurses were away from the bedsides lasted only a few moments, others were hours long. I discuss the nature and impact of these iterative visits in Chapter Six.

When clinicians left the bedspace I remained there, turned off the audio-recorders and on occasion spoke to the patients, if they or their carers initiated a conversation, which they

frequently did (see my note above regarding non-participant observation). On occasion I went looking for relatives, medical staff, extra pillows, or water for the patients if requested to do so. Where possible I accompanied each patient to the radiography or sonography sections of the ED and waited for them outside the X-ray rooms (except on occasion when I was allowed in) to return to the ED. On these occasions I also recorded their interactions with the orderlies or wards men, as they journeyed to and from the radiography sections.

As the study progressed, I became more interested in the sequential processes of work in the consultation as enacted by the nurses and doctors. I outline in detail below how nurses' and doctors' sayings, doings and beings were defined by the institutional setting and their disciplinary exigencies, how nurses and doctors used the bedside space and how they engaged with the ED equipment – the objects. In doing this, I was utilising specific ethnographic and linguistic ethnographic analyses, which suited the theoretical approaches to the domain I wished to study *ex post facto* – ED work – a site where knowledge, language, space, objects and social relations could be examined as integrally interconnected.

3.6.   The data set: two case study consultations

I undertook checking the audio-recorded transcripts of patients' consultations. I kept notes of what I deemed to be significant in the audio-recordings as I checked the transcripts. As I listened to many recordings, I became increasingly familiar with the tempo-rhythm (Johnsson 2012) of the consultations. The term tempo-rhythm is used by Johnsson and is originally taken from Stanislavski describing 'how actors incorporate speed, intensity and variability' in the dramatic arts (Johnsson 2012, p. 51). As I listened to the audio-recordings, each consultation replicated (practice) patterns that were similar and recognisable across all the ED consultations. While no-one in particular is agentive in incorporating these rhythmical shifts, they came about in the different stages of the consultation based on tasks and activities. These patterns are visible in the practice/LE matrix for both patients in Appendix 5 where Jane Edna and Joel are less vocal in the early stages of arrival in the ED, but become more so towards the latter stages. Also in the first part of the consultation as nurses and doctors are first investigating Jane Edna and Joel, there is more activity and there are more people involved.

I began to understand what nurses and doctors did and said as 'the collective 'property' of [a] group[ ], not just the 'possession[ ]' of individual practitioners' (Kemmis 2005b, p. 393).

For practice theorists, the professional activities of nurses and doctors, extant in standard medical interviews, could be seen as part of a long history, which today's nurses and doctors were perpetuating (Gherardi 2012; Reckwitz 2002; Schatzki 2009) in the ED. As custodians of these practices, nurses and doctors could be understood as responding to the histories of their respective disciplines, as well as to the expectations of their patients today. Moreover, their doings, sayings and beings could be understood as institutionally and disciplinarily prefigured and passed on through the organizational memory of the ED.

On the basis of the familiar patterns, I resolved to examine two consultations as case studies that would be unique, but representational. I selected Jane Edna and Joel (whom I introduce in Chapter Four) for a number of reasons.

I spent the longest time of all my consultation observations with Jane Edna, over 10 hours. This time frame meant that I was able to investigate a number of clinicians (ambulance officers, orderlies and others) who were involved in Jane Edna's consultation. Her presentation on the day I audio-recorded her, followed a presentation the week earlier. This gave an insight into how the ED manages its medical records and how this impacted on Jane Edna's consultation, on how nurses' and doctors' worked with her medical information: Jane Edna herself made reference to her records from the previous visit in the consultation. Jane Edna was elderly and in this she was representative of a growing demographic population presenting to the ED. Her ultimate diagnosis was 'epigastrium', a benign condition, yet it took the ED over 11 hours to reach this conclusion. In that sense her consultation provided additional insights into the practices/learning of the junior doctor who conducted multiple tests and screenings. The delays at radiography (and Jane Edna's experiences there) because of the absence of the radiographer and the CT scan also provided insights into the way that knowing evolved throughout the consultation.

I selected Joel because he was, unlike Jane Edna, extremely ill: he was a palliative care patient. His consultation offered a different perspective on care, and the information involved and knowing. I also selected Joel's consultation because his wife, Jill, who had been caring for him closely for the past four years, was a trained nurse. Jill accompanied Joel and played a large part in the consultation. She answered for Joel, gave him instructions, and spoke to all the staff. These actions on her behalf provided an opportunity to examine how the junior doctor's and Joel's wife knowledges were contested during the consultation. Joel's consultation, as a three-way consultation, was made visible in

the encounter diagram (see Appendix 5). I also selected Joel's consultation because it was an example of how a patient was at the centre of an extended network of fragmented knowledge (Bruni, Gherardi & Parolin 2007). Joel was connected to previous hospitals, specialists, a palliative care team and now multiple attending nurses and doctors in the ED. I also selected Joel's consultation because it provided insights into the practices/learning of the junior doctor as he worked with senior staff ED nurses.

Each consultation permitted the individuality of each patient's healthcare situation to be analysed, but in a shared landscape of activity and social action. The doctors in this study repeatedly stated that each patient must be seen as an individual – each patient's medications, personal circumstances, attitude, physical strength, predispositions, allergies, etc. – all rendered this patient, today, a unique case. One junior registrar outlined the importance of recognising this uniqueness from the patient's perspective:

> I think the main priority with patients is to identify the problem from their point of view. So the same condition in two different people may have various impacts and may be interpreted differently. So, it's important to identify not what the disease process is but why that person has come in today, and for what underlying reasons, you know, maybe having [an] impact on aspects of their life. So it's that sort of global sort of picture. So yeah – illness from the patient's point of view [is important]. (Interview with Junior Registrar: 08072008)

Yet my observations and analyses revealed how despite this uniqueness, each patient is a part of what is seen as an intended systematic, organised model of care.

My two case study patients' illnesses as patients are unique. Yet they, like others, slot into an accepted organisational way of life that constitutes the workings of an ED: the networks of talk, actions, participants and material arrangements that together make up ED work. On occasions, I contrast and compare them with those of other patients where appropriate, as paradoxically, they are the same yet different from each other and every other of the 82 patients audio-recorded. Therefore, although my case studies are 'unitary', the discussions and descriptions that emerge from them

> are made up of numerous case studies designed to bring out the connection among them woven by social action. The subject of the case study is the local texture of individual, group, organizational and institutional practices which, in a territorial setting circumscribed by reciprocal interactions, interweave, dissolve and become institutionalized (Gherardi 2006, p. 55).

Using the consultations of two patients as case studies highlights features shared by all kinds of case studies. Gherardi draws on Eisenhardt's idea that 'the case study is a research *strategy* which focuses on understanding the dynamics present within single settings' (1999, p. 135 in Gherardi 2006, p. 55). 'It is a way of organizing social data so as to preserve the *unitary character* of the social object being studied' (Goode & Hatt 1952:331, cited in Mitchell 1999:184 in Gherardi 2006, p. 55). My two case studies reveal complexity because they have allowed a close examination of what is going on.

Mol (2008, p. 9) agrees and argues that case studies are a way to learn new lessons, especially when examining a practice. According to her, '[g]ood case studies inspire theory, shape ideas and shift conceptions. They do not lead to conclusions that are universally valid, but neither do they claim to do so'. By immersing myself in my two case study patients, I have learned specific lessons, particularly how practices are (re)produced and how knowledge is situated, visible and entangled with people, objects, language and material arrangements. Mol indicates that

> [c]ase studies increase our sensitivity. It is the very specificity of a meticulously studied case that allows us to unravel what remains the same and what changes from one situation to the next (2008, p. 9).

I now examine how these methods and the data they produced, fit within the methodological approaches of quasi ethnography and LE and how these methodologies might provide an authentic, empirical perspective of practice in the ED.

3.7.   Data produced: analysis of the consultation audio transcripts and field notes: knowledge networks

I present findings on knowledge networks – connections between people working together – in Chapter Four and outline here how these developed. In developing the knowledge network figures, I drew initially on Lazer and Friedman's (2007) and Bruni *et al.*'s (2007) work. My approach is also informed by studies that have investigated networks and interactions in healthcare settings (and in EDs) (see, for example, Fairbanks, Bisantz & Sunm 2007; Reddy & Spence 2008; Woloshynowych *et al.* 2007) and more recently by work undertaken by Nugus & Braithwaite (2009) examining healthcare relationships.

I present my developmental drawings here to illustrate how the knowledge networks developed from my field notes in the ED. As I was observing each consultation, I began to draw network lines *in situ* as shown in Figure 2, which is an early knowledge network diagram in one hospital (with patient Denton) showing links between nurses, doctors and Denton. The visual representations of these knowledge networks developed progressively as I gathered more data from the audio-recorded transcripts and from the nurses and doctors involved in Denton's care. In Figure 2, I began by drawing lines between those nurses and doctors that I established had either communicated or not with each other about Denton.
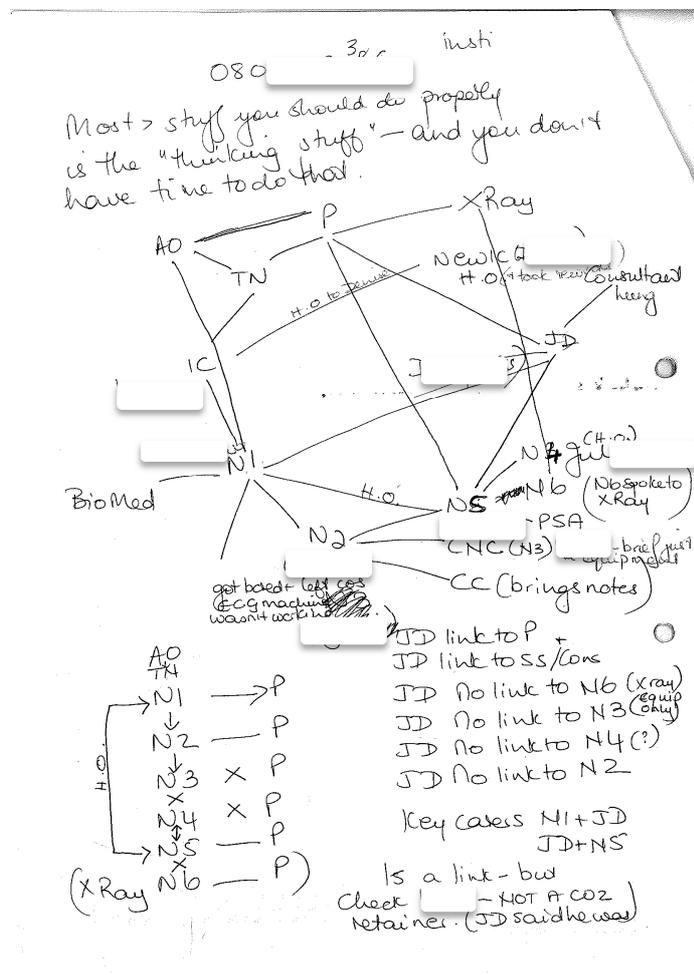
Figure 2: Early field notes showing links between clinicians

Figure 3 is a further developed version of a knowledge network that I drew for patient Dulcie, towards the latter part of the data collection process.
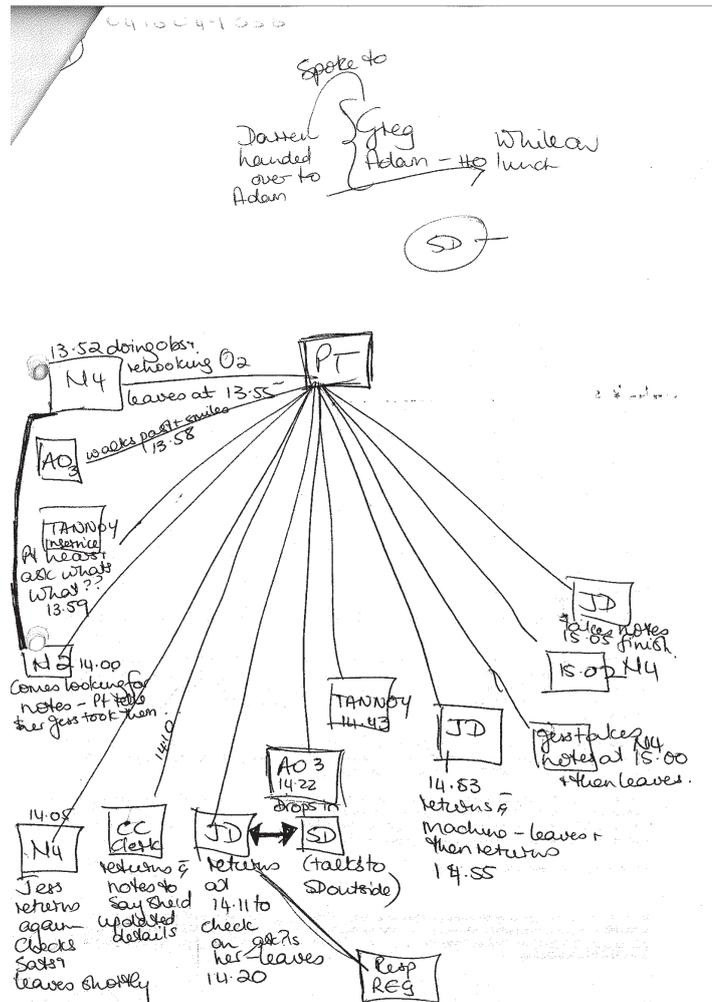
Figure 3: Later field notes showing timings of clinicians' visits to Dulcie's bedside

I stylised these hand drawn networks (see Figure 4 below). Figure 4 is a small-scale version of what are depictions of the knowledge networks – or networks of potential knowing – in the ED. In these final network figures I represent the sequence, connections and number of different clinicians who interact with the two case study patients, Jane Edna and Joel, over their time in the ED.
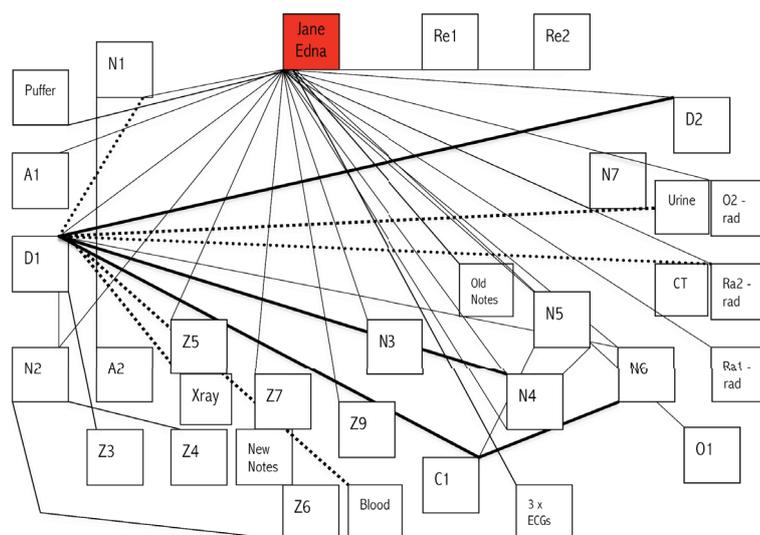
Figure 4: Small scale version of a final knowledge network

I initially set out these networks to reflect the connections between nurses and doctors as they worked with each other. I supplemented the visual figures with written documentation (the patient record), the audio-recording of the consultation and other ethnographic observations written down in field notes.

By observing networking and the doing of knowledge together among team members – how the activities of knowing unfolded – and initially by looking at linear, random and totally connected networks (Lazer & Friedman 2007), I sought to establish how doctors and nurses networked their knowing in the ED with each other and with each patient. I noted how often they worked as a clinical team together at the bedside; I noted (where possible) how frequently they talked to each other away from the bedside. I noted the spatial and interactional activities (comings and goings and interactions) they used at the bedside and where possible, away from it. I also sought to identify the way nurses and doctors used objects and equipment (blood pressure machines, IV drip poles, ECG monitors and printouts, X-rays, etc.) to resource their knowing.

3.8.   Analysis of the consultation audio transcripts and field notes: the practice/LE matrix

Once I had selected my two case study patient consultations, I began working closely with their transcripts and my field notes. On the consultation transcripts, the absence of marked time breaks and interruptions to care gave the impression that the consultation was one

lengthy conversation, as if it were a standard medical consultation where a doctor might spend a continuous fifteen minutes with one patient and interact with him or her. I wanted to analyse aspects of practice, not just talk, so using field notes (in which I had recorded the spatial and interactive aspects of the consultation) and LE analysis (nurses, doctors, carers, patients), I coded the transcripts to show breaks in the consultations, interruptions, noise and movements, return visits by clinicians to the bedside and different speakers to develop full consultation diagrams (see Appendix 5). These developed as a visual representation of the ED consultation. I sought to show how the ambient noise of the ED and patient movements as spatial elements of practice impacted on the consultations. In Table 3 below I itemise the elements of practice (including sayings by different people) I reflected in the transcripts, which I developed as a practice/LE matrix:

	Who or what is involved in (re)producing knowledge in the consultation	Aspect of practice 'represented'
	Nurse(s) talking to/treating Jane Edna or Joel	People, sayings, doings and beings
	Doctor(s) talking to/treating Jane Edna or Joel	People, sayings, doings and beings
	Jane Edna or Joel initiating talk	People, sayings, doings and beings
	Joel and Jill (wife) talking to each other	People, sayings, doings and beings
	Senior doctor(s) talking to/treating Jane Edna or Joel	People, sayings, doings and beings
	Researcher(s) talking to Jane Edna or Joel	People, sayings, doings and beings
	Talk between two clinicians when Jane Edna or Joel could hear them	Sayings (talk/language)
	Talk between two clinicians discussing procedures, equipment etc.	Sayings (talk/language and objects)
	Patient being relocated, e.g. to a new bed, to or from the ambulance bay, to or from radiography	Material arrangements (space)
	A disturbance that impacts on the consultation, i.e. a noise, interruption, bedside X-ray machine	Contextual elements including noise, objects, etc.

Table 3: Coding for the practice/LE matrix

Coding the transcripts as encounters

Using the practice/LE matrix I coded each new action and/or each new interlocutor with a patient on the transcript. I coded patient relocations in the ED, each noise disturbance or interruption (by tea ladies, for example). I call each of these events 'an encounter'. I identify each of these encounters, particularly each nurse's and doctor's saying and/or doing (action) as episodic, what Schatzki calls an 'event' (Schatzki 2011), a bounded physical or discursive action. The notion of 'event' is elaborated on below, but is crucial in

understanding the way I was seeing the flow of activity in the consultation. The performances of nurses' and doctors' actions unfolded as activity, in successive events (Schatzki 2006). It is this concept of successive episodic events that facilitates thinking about knowledge, not as a fixed entity, but as ongoing and unfolding activity, as knowing, as the 'organization happens' (Schatzki 2006).

The practice/LE coding matrix identifies both the processes and the content of what is being said by patients, doctors and nurses. Firstly, the colour codings indicate different interlocutors (the processes), for example, when nurses and doctors re-introduce themselves or re-question the patient after an absence etc. They also indicate the content (i.e. whether nurses and doctors are talking about the patient or about their work). The colour codings also indicate when the patient speaks up, makes a request, or exercises their agency. In doing this, I seek to represent the different discursive, disciplinary, clinical, spatial and social practice dimensions of the consultations.

Below in Table 4, I illustrate the coding of each of these interactional and clinical events – sayings, doings, beings, disturbances, relocating of patients and engagements with objects – on a selected part of Jane Edna's transcript.

Speaker	Talk or event
A1 & D1	Not sure what she was in for, (..)
DIST	*((loud background noise))*
D1	What for?
A1	Don't know.
D1	Mm mm.
A1	Probably the same.
N2	==Sorry about that. Just going to take your shirt off.
P	Oh look I don't think you need to take those off because…
N2	I'll take – can I take the bra off?
P	= = No, I won't be staying.
D1 & A1	= = Because she's got the macular (..) grey.
N2	I just need to do a heart trace and make sure your heart's okay.
A few moments go by with other sayings and doings until junior Doctor Louis (D1) speaks to Jane Edna for the first time	
D1	Hello Jane *((D1's first interaction with Jane Edna begins here at 10.20am))*

Table 4: Coded encounters on the audio-recorded transcripts

On Jane Edna's arrival in the ED, an ambulance officer (A1) is explaining to the junior doctor Doctor Louis (D1) that Jane Edna (the patient P) had been in the ED a few days earlier. The lime green coding indicates that two or more clinicians are talking in earshot of Jane Edna about her; pink indicates a noise disturbance; pale yellow indicates a nurse (in this table it is Nurse Bella (N2)). I code Nurse Bella (N2)'s interaction with Jane Edna and it is coded thus because it signifies an interlocutor talking directly to Jane Edna; purple indicates Jane Edna initiating talk to Nurse Bella (N2); Doctor Louis (D1) and the ambulance officer (D1 and A1) talking to each other are then audible again and immediately following this Nurse Bella (N2) explains to Jane Edna why she needs to take her bra off. In the *repeat* of the interactions above, I explain the colour coding of these interactions below in double brackets:

A1   *Not sure what she was in for? (..) ((bright green as A1 and D! are talking about Jane Edna within earshot))*

DIST   *((loud background noise – pink to signify a disturbance))*

D1   *What for? ((no new colour as their conversation continues))*

A1   *Don't know*

D1   *Mm mm*

A1   *Probably the same, seems to call us (often) ((referring to Jane Edna having called the ambulance before))*

N2   *Sorry about that just going to take your shirt <u>off</u> because ((yellow as N2 speaks to Jane Edna directly)) ((conversation occurring parallel to D1's discussion with Patient Jane Edna))*

P   *Oh look I don't think you need to take those off because…((purple because Jane Edna makes an initiating move))*

N2   *I'll take – can I take the bra off ((continuation of N2's conversation with Jane Edna, so I do not colour this again as her sayings are continuous))*

P   *[No I won't be staying*

D1   *[Because she's got the macular (grey) ((lime green again, because Jane Edna is in earshot and this breaks into the conversation N2 was having with Jane Edna))*

N2   *I just need to do a heart trace and make sure your heart's okay ((pale yellow as N2 speaks to Jane Edna directly again)) ((conversation occurring parallel to D1's discussion with Patient Jane Edna))*

((A few moments go by with other sayings and doings until junior Doctor Louis (D1) speaks to Jane Edna for the first time))

D1   *Hello Jane ((D1's first interaction with Jane Edna begins here at 10.20am))*

When two things occur at the same time, such as might happen if someone is talking to a patient while moving them, I represent the patient relocating (a red square) sequentially, and thereby indicate another encounter. If another speaker or a disturbance such as a phone call or fire alarm or excessive ED noise interrupts the flow of the consultation, I indicate this disturbance or interruption with a differently coloured square. The codings illustrate who initiates, who addresses who, what interrupts – the processes of talk and

action (sayings, doings and beings) – the sequences of different interlocutors, interruptions, discussions, use of objects and equipment, movement and noises.

After I had completed the colour coding of the entire consultation transcript, I copied the colour codings further into a tabular format, as shown in Table 5 below.

Step 1 – the coding   **Step 2 – the tabular format**   **Step 3 – the practice/LE matrix**

Speaker	Talk or event
A1 & D1	Not sure what she was in for, []
DIST	*((loud background noise))*
D1	What for?
A1	Don't know.
D1	Mm mm.
A1	Probably the same.
N2	Sorry about that. Just going to take your shirt off.
P	Oh look I don't think you need to take those off because…
N2	I'll take – can I take the bra off?
P	[No, I won't be staying.
D1 & A1	[Because she's got the macular [] grey.
N2	I just need to do a heart trace and make sure your heart's okay.
((other sayings and doings))	
D1	Hello Jane *((D1's first interaction with Jane Edna begins here at 10.20am))*

Table 5: Development of the practice/LE matrix: a research artefact

Step 1 illustrates the practice/LE matrix codings on the transcript; Step 2 illustrates the tabular format of these codings; and Step 3 illustrates the practice/LE matrix (in a small-scale version) of the consultation. (Although I discuss two full consultations in detail in Chapters Four, Five and Six, I reproduce only a part of their consultations in those chapters). In Appendix 5 I include a complete practice/LE matrix of Jane Edna's and Joel's full consultations.

I use the practice/LE matrix as a research artefact. This means, it is representational rather than a reliable conventional discourse analytical or temporal representation of the ED consultation. For example, I have not utilised standard 'move' (interactional) analyses of interactions such as those undertaken by Systemic Functional Linguistics (SFL) or CA. Similarly, each square does not show the overall time involved with the patient, or where long absences between clinician visits take place. Thus, although Jane Edna's and Joel's consultations are reflected in their overall practice/LE matrix (see Appendix 5), interactions themselves are not represented as longer or shorter than others. Rather, the practice/LE matrix presents in a visual format an abstracted, linguistic ethnographic representation of the consultation.

In Table 5 above, I have not shown coded objects (such as thermometers, cannulas, etc.), but I make reference to these in the discussions and in the full practice/LE matrix of both consultations. To view a reference to an object, see Jane Edna's practice/LE matrix in Appendix 5, where objects are listed in various squares, for example, after square 133.

The practice/LE matrix, and the complexity and texture of the consultation, illustrate visually 'the texture' of practice (Cooper & Fox 1990; Gherardi 2006), as disciplinary practices, interactions, artefacts, people, space and time are interwoven with one another. The practice/LE matrix also illustrates the linguistic, human, artefactual and spatial shifts of activity in the overall consultation. For example, Jane Edna's involvement (shown in purple) is concentrated in the centre of the consultation, while there is less involvement by her in the beginning and at the end of the consultation, suggesting a change in her participation as the consultation evolves. The nurses' and doctors' interactions are also concentrated at different times of the consultation, particularly in the beginning of the consultation where they triage and settle Jane Edna and take her history. This pattern is similar for Joel's consultation, maintaining the tempo-rhythm (Johnsson 2012) of the consultations referred to above.

The practice/LE matrix renders a total consultation picture of events (initiations of) talk, things, noise, people, movement and spatial developments that is the organisation 'as it happens' (Schatzki 2006); they show patterns of daily work.

3.9.   Limitations of the study

Understanding methodological limitations

Although linguistic ethnography sits comfortably alongside other practice theory methodologies, and pays attention to the 'etic – emic, frontstage – backstage, text – context, and linguistics – ethnography questions' (Jacobs & Slembrouck 2010, p. 235) of work, it might be considered as limited in its application. This is because linguistic ethnographers can focus on some aspects of the context and how language works in the institution, while ignoring others. These foci can be subjectively determined. This limitation is partly overcome as I have used practice theory considerations to supplement LE from an ethnographic perspective. For example, these include the material arrangements (noise, space, mobility, objects) and knowledges (including roles and people) – all practice concerns determined by the institution and the disciplinary paradigms of nursing and medicine.

The approach to examining the professional, discursive and social activities of nurses and doctors and patients in and around the bedside space foregrounds a methodological assumption in the study, i.e. that the complex sets of relationships and work practices that exist between nurses and doctors in the overall ED, the backstage, could be inferred from the professional, discursive and social activities and actions, captured in the bedside space, the frontstage (Goffman 1959 in Jacobs & Slembrouck 2010, p. 236).

This assumption is addressed by Gherardi (2006). She argues that many network theorists, examining how knowledge and/or information travels in organisations, do this in one of two ways. They examine how networking is done, either through social capital resourcing, based on the cohesion of the ties between people, or through 'structural hole theory' (Burt 1992 in Gherardi 2006, p. 190) where knowledge is brokered around a central actor. Gherardi says that each of these approaches fails to recognise that the structure, existence and shape of the network is in itself a reflection of the social, material and interactional relationships of that setting. For Gherardi, knowledge as it is (re)produced *in situ* reflects the situatedness and emergence of knowledge in that organisational setting: it is how workers know in practice – they draw on the people, the relationships, the arrangements, the sayings, doings and the beings – to (re)produce knowledge in that context. Therefore

the frontstage and the backstage are intrinsically and inherently connected to one another. They are of course also linked to the wider nexuses of practice of medicine and nursing.

Furthermore, in seeking to establish the networking that nurses and doctors did away from the bedside, in some instances, complete network links were not always determined because of the difficulty of tracking clinicians away from the bedside if they consulted with other clinicians about Jane Edna or Joel for example. Where medical records did not supplement this information, network links were either assumed or inferred from the consultation transcripts – audio-recorded at the bedside – or they were left incomplete. These connections have not been represented in the network figures.

The contextual or non-linguistic elements of the consultation are all part of a practice landscape and combine well with the audio-recordings of patient-clinician consultations. Utilising both the audio-recordings of patient-clinician consultations, observational field notes and LE analyses, I offer a unique ethnographic and linguistic ethnographic perspective on the ED consultations.

Limitations in recruiting patients to the study

Ethical considerations excluded some patients from the study. For reasons of child protection, only patients over the age of 17 were deemed appropriate; and for practical reasons only those patients who could communicate in English without the need for an interpreter were considered for the study. Patients selected were also limited to those triaged in categories 3, 4 and 5 (Australasian College of Emergency Medicine 1993), i.e. patients who were not in immediate need of resuscitation or attention. None of these exclusions applied to Jane Edna and Joel. They were both deemed to be suitable candidates.

In general, recruiting patients to take part in the study was done in consultation with hospital triage staff. This meant that certain kinds of patients on occasion might have been deemed inappropriate by clinical staff, which limited selection on some occasions. None of the above exclusions is deemed to be significant for the way that knowledge is (re)produced in the ED. Patients in all triage categories, and those of different ages experience the ED in a systemic way. Although there may be procedural differences in their care (such as if they require resuscitation or if they needed an interpreter), from a working/knowing perspective, these differences would not be material.

Limitations of the research perspective

As research is a practice (Green 2009a), undertaking this study entailed learning that practice. Green refers to Higgs *et al.*'s (2009) ideas on expert practice where there is a movement from 'practice to praxis, and from praxis to praxis artistry' (Higgs, McAllister & Whiteford 2009) as ideas, approaches, paradigms are sorted, categorised, understood, liked and disliked, progressively. Praxis incorporates an abstract understanding of what one is doing.

This kind of journey into research and generally the development of research skills as praxis artistry have been previously theorised. Hamilton (2005 p. 288 in Green 2009a, p. 13) notes:

> In practice, I suggest, research is always a fumbling act of discovery, where researchers know what they are doing when they have done it: and only know what they are looking for when they have found it.

According to Green

> …Hamilton's formulation suggests… that there is always an emergent quality to research-as-practice. This involves combining discovery with speculation, and approaching the practice of research as a probe into the unknown (Green 2009a p 13).

This kind of exploration and discovery makes qualitative research very different from research undertakings in more positivist paradigms that begin with and then aim to prove a hypothesis; interpretivist research on the other hand, is emergent and changing.

As I became more interested in what was happening in the bedside space beyond the clinician-patient sayings, doings and beings, I sought to place a greater emphasis on how the ethnographic and linguistic data (the transcripts of the audio-recorded consultations)[15] were interconnected (Flynn, Van Praet & Jacobs 2010). I spent a substantial amount of time in each ED – an eventuality that was instrumental in my growing understanding of practice(s) as well as my growing understanding of what the experience of ED care meant from each patient's perspective. The extensive amount of time I spent in EDs created an observational and ethical dilemma for me as the initial stance of 'non-participant

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[15] The sayings are understood as linguistic data.

observation' on occasion became one of participation as patients shared their feelings, personal details and thoughts with me. The observational stance was initially intended as non-participatory, but on occasions I did participate in interactions with patients and nurses and doctors.

However, by visually depicting events in the practice/LE matrix, by marking up the transcripts using ethnographic field notes and LE analyses, identifying noise disturbances, interruptions, overlaps, and continuations, I offer my own interpretation of the consultation transcripts and ED work. These 'markings' and the ethnographic field notes highlight the way nurses' and doctors' sayings, doings and beings 'happen' in the space of the ED at patients' bedsides. They indicate the relationship between the elements of the interactional, disciplinary, institutional and spatio-temporal setting – its timespace as I perceived and then interpreted them at the level of the ED's activities. As a visual artefact the encounters illustrate connections between multiple participants, talk and objects, and how these produce a texture of practice (Gherardi 2006). In this representational format, the visuals are one way of understanding and describing nurses' and doctors' activities in the very complex organisational setting of the ED.

The limitations of the methodology and its representations are those common to interpretivist/constructivist paradigms (Mackenzie & Knipe 2006). Did what I 'see', 'explain' what was in fact going on in the frontstage or the backstage, the 'culture of practices' between nurses and doctors? When I describe nurses' and doctors' activities this involves interpretivist modalities in ways that I sought to represent them (Green 2009b; Yanow 2000). Corradi *et al.* (2010) draw attention to the *invisibility* of practices. They argue that practices are paradoxically 'not directly accessible, observable, measurable or definable' (2010, p. 267). Gherardi, as one of the author's of Corradi's paper, proposes that knowledge is observable (in doings and sayings). For Gherardi, knowing is a situated practice and a practical accomplishment. Knowing and practising can be understood as equivalent to each other. This enables us 'to analyze knowledge [knowing] as an observable phenomenon and propose a framework that focuses on knowing as a situated practice' (Gherardi 2008, p. 522). The practice is what I interpret: knowledge is what I see in the practising.

In line with this, my thesis recognises that the truth is always partial and in the words of Kemmis

> fallible and shaped by particular views and material-social-historical circumstances, and that it can only be approached intersubjectively – by exploring the extent to which it seems accurate, morally right and appropriate, and authentic in the light of our lived experience (Kemmis 2005a, p. 7).

Thus, in writing, I am aware of the role of my own cultural predispositions (and those of others) in the research process and by conferring with others, I have been alerted to the way that my own perceptions of ED activities, organisational teamwork and medicine expose my own influences on the interpretation of the particular topic and the context. Thus they expose 'the mechanics of (my research's) own production' (Rhodes 2001), through self-reflexivity.

In discussions with and presentations to the doctors in the ED sites, the study's qualitative approach has been both welcomed and challenged. The visual representations of patients' consultations (the practice/LE matrix) have given them a tool to connect with and 'see' what they experience on a daily basis: multiple interactions, complexity, even the uncertainty of ED work. On occasion however they have challenged the qualitative approach of the study. For them, as scientists, they are more familiar with quantitative research, a principal component of their own training. Doctors wanted to know: *What was I measuring? How could I prove what I was saying?* In the context of medical science (where this study is located), the more usual approach to investigating problems falls within a quantitative research paradigm with an emphasis on positivist, or Random Control Trials (RCT) investigations. In a positivist approach, medical researchers begin with a hypothesis and aim to prove this hypothesis.

Qualitative research on the other hand is very different from research undertakings in positivist paradigms 'as there is always an *emergent* quality to research-as-practice' (Hamilton 2005 in Green 2009a, p. 13). The doctors (principally) are very interested in the findings, as they recognise themselves and their work in these. However, they remain uncomfortable with the qualitative findings about their actions and activities as the findings of the study challenge the certainties of medical practice and the linear orderings of the ED model of care: these findings are extra-theoretical to healthcare in how the field understands both organisational and evidentiary (medical) knowledge (Nicolini *et al.* 2008).

The ethics of the study

The Ethics Committee of the University of Technology and those of participating area health services granted ethical approval for my research.[16] Patients gave written consent to have their consultations audio-recorded and observed, their medical records reviewed, and their feedback recorded in a follow-up interview. Patients could freely agree or decline to take part in the study. Similarly, all clinicians had an opt-out consent arrangement even though patients might have consented to having their consultations audio-recorded.

Healthcare covers both very public and very private and personal spaces for clinicians, patients and their families. The work of all clinicians, particularly in hospitals, is under constant collegiate, patient and organisational scrutiny because it is high stakes work, particularly in the ED. The addition of research surveillance exposes clinicians, patients and their families more extensively to unforeseen analytical interpretations of what they do and what they experience. In some instances nurses and doctors were not comfortable about being observed and audio-recorded as they went about their work. Because of this, I informed doctors and nurses via briefing sessions of the purpose of the research study. I indicated that their individual practices would be described in the context of a systemic framework rather than judged or evaluated at the level of the individual.

By adopting a practice theory approach, I have further emphasised the 'extra-individuality' (Kemmis 2009) rather than the individual nature of nurses' and doctors' activities and actions. At a practical level, however, and to avoid any possibility of individuals being identified, significant effort has been made to ensure that all data is de-identified and the study guaranteed to exclude any information that could identify a particular hospital, clinician or a patient. In line with healthcare research, all data is kept locked and is securely guarded on computers. Because of the nature of the data obtained, I have followed strict ethical procedures in obtaining and storing their data; only de-identified data have been made public.

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[16] UTS HREC 2008-201A

3.10. Concluding comments to Chapter Three

In Chapter Three, I outlined the epistemological, theoretical and methodological approaches and methods used in the study. I justified the focus on a complete consultation and the selection of two patients as case studies.

I presented the analysis of the audio-recorded transcripts and field notes and how these developed:

- the network diagrams; and
- the practice/LE matrix.

I present these as *in situ* and *post facto* analytical tools – a methodological contribution to researching practice. I also identified the combination of practice theory and LE as innovative. I posited that together these contribute to a deeper understanding of work in the ED.

I outlined the epistemological limitations of the study, shared by all qualitative research paradigms, limitations in recruiting patients to the study and my limitations as a researcher.

In Chapter Four, I introduce my two case study patients, Jane Edna and Joel, as central to work in the ED. I draw on the network diagrams and the practice/LE to explore working practices in the ED from macro and micro perspectives.

Chapter Four – Working practices

Purpose and flow of this chapter

In Chapter Four I introduce Jane Edna and Joel, the two case study patients. Based on the data analysis tools I introduced in Chapter Three, I examine, firstly, from a macro perspective, how nurses and doctors enact disciplinary activities and actions which are organised by the ED's staged, linear model of care – the ED's organizational memory. Secondly, I examine from a micro perspective how nurses' and doctors' individual and disciplinary actions and activities at patients' bedsides draw on complex and 'textured' (Gherardi 2006) doings, sayings and beings.

Through these two perspectives the organisation of the ED consultation reflects how knowledge is networked and (re)produced there: who is involved; what roles and statuses are activated; how nurses and doctors connect to each other and to patients; and how material arrangements impact on knowing.

I then consider how (medical) knowledge is conceptualised in the current staged model of the ED consultation, premised on the intended linear transfer of patient and treatment information.

By exploring what happens in practice, I illustrate that information, and the way information may be resourced to inform/enact medical and nursing knowing, is not necessarily fixed or linear and that knowing (also not linear) is (re)produced through praxis in which multiple practitioners undertake intelligible actions and activities that make up the practices of the ED. These practices maintain and are maintained by this organizational memory – a configuration of objects, language, people, space and time.

4.1.   Introducing Jane Edna and Joel

Below I introduce Jane Edna and Joel, two patients whose experiences and ED consultations I analyse in detail in this and in subsequent chapters. Caring for and treating Jane Edna and Joel situate them at the centre of doctors' and nurses' actions and activities: this is what their work is about.

Jane Edna is a 95-year old nursing hostel resident who rings an ambulance one morning to take her to the ED – a medium-sized metropolitan teaching hospital. Jane Edna, who is almost blind, presents with vague symptoms of lower epigastric pain (and reports having experienced chest pain four hours earlier), which the clinical team works to diagnose and treat throughout what becomes for Jane Edna a long and traumatic day.

Over the space of the 11 hours, 15 minutes that she is in the ED, Jane Edna's care involves 22 people in total with specific care by two doctors, seven nurses, two ambulance officers, two orderlies, three radiography staff and one aged care nurse. She also engages with two researchers, and is interrupted by a man fixing the curtains, a cleaner and a tea lady. Jane Edna has her medical history taken and is examined and questioned by 19 different clinicians/staff members; she undergoes a range of medical procedures including three ECGs; she has two lots of blood samples taken; she has one X-ray and then a CT scan and wears an oxygen mask. The CT scan is delayed for five hours by the absence of the radiographer, which has caused a backlog in the X-ray department: *I think they're all out to tea somewhere*, the orderly informs Jane Edna.

Jane Edna has a distressing time in the ED. When she does finally have the CT scan, she finds the experience harrowing. In addition, she is admonished three times for calling the ambulance by herself without alerting the hostel staff to her condition (and for which the ED ends up paying the return trip); she has her clothes removed against her will; she must go without food even though she is hungry; she constantly wants to go home; she is exasperated and confused by repetitive questioning and begins to forget things; and she experiences institutional anonymity as she is incorrectly addressed on 12 occasions as successive clinicians do not use her preferred name. On three different occasions different clinicians do not know that Jane Edna is blind.

During her stay, on 92 occasions there are other noises, voices and loud disturbances around her bed, but she does have some comforts. Jane Edna has her radio with her which, at one stage, she turns on; she takes out some cream she has brought with her to wet her parched lips; she talks about her Vitacall (an electronic buzzer she uses to call staff in the hostel where she lives). She tells the researcher about her weekly discussion group at the hostel; her job as a fashion designer when she was young, as well as offering further information about her life growing up in Sydney, including how her brother almost drowned as a child.

Jane Edna's condition is confirmed as 'epigastrium' after she insists on eating a sandwich that causes indigestion. N6 is the one who suggests that it is 'epigastrium' which is immediately acknowledged by Doctor Louis (D1), but not confirmed to Jane Edna until he has received the CT scan results. Finally, the night shift doctor, Doctor Edwina (D3), gives Jane Edna her diagnosis.

Jane Edna is sent back to her hostel by ambulance late that night. In her own words: *I've been here all day and I've had – I'm an old lady, darling, and I want to go home. So, I'm getting impatient I'm afraid. I've come to the end of my tether* (adapted from Manidis & Scheeres 2012).

Joel is a 67 year-old palliative care patient, with metastasised cancer in his leg, originating from kidney cancer. I spend just over four hours with Joel in the ED

(out of his total stay of seven hours, two minutes). Jill, Joel's wife accompanies him to the ED. Jill, a former nurse, has *an abundant (sic) of information* about him, as reported by one ambulance officer. Jill has been carefully recording a detailed history of Joel's entire, very serious illness for a number of years. Jill answers on behalf of Joel 38 times throughout the consultation.

A total of six nurses, one junior doctor and two ambulance officers look after Joel in the time I record his consultation. A nurse and another nurse assist the attending nurses, once with cataloguing Schedule 8 drugs (otherwise known as 'Controlled Drugs' that carry abuse and or addiction potential). On one other occasion the nurses do a short in-service session. This in-service occurs when Joel's blood is taken the first time and the procedure provides an opportunity for training some of the other nurses on using new equipment: *Yeah. Just a little in-service while you were waiting,* to which he replies: *No problem.* On one occasion Joel is offered tea during his stay in the ED and he also requests a glass of water, an event that highlights the absence of team knowledge surrounding his care.

Like Jane Edna, from Joel's perspective, the visit to the ED is also a frustrating experience and coming into the hospital is a journey that he undertakes very reluctantly. At times he expresses his frustration at being there. Joel has earlier told Jill that he never wanted to return to hospital: *I vowed to her I would never come back to hospital again.* However, they are there, as Jill informs the doctor and nurses during the consultation, because she can no longer care for him by herself. Jill feels they must get to the bottom of what is causing his worsening pain: *We've got to find out why this pain is so bad.* Joel, however, only feels pain if he moves, a fact he relays to the triage nurse and others, yet on multiple occasions the attending clinicians confuse this distinction. This distresses Joel.

Throughout his consultation, Joel is alternately confused and extremely alert. On several occasions Jill informs the nurses that he cannot remember things because of the medication that he is on. Joel confirms this confusion as he tells Jill at one point: *They're asking me all these funny questions.* And Jill explains why he might be confused: *He's had lots of Oxynorm.* Yet at other times, Joel is alert enough to be ironic when Doctor Surita (D1) tries to delay him going to the toilet by asking him if he can wait for two minutes, to which he replies: *Oh, yeah. I'll wait. Wait for half an hour.*

Joel is also alert enough to notice and comment on the way Doctor Surita (D1) and Nurse Leah (N6) are interacting. He makes a number of comments about the doctor to the nurse, to myself (the researcher) and to his wife Jill. He thinks the junior doctor, Doctor Surita (D1), is not doing very well with his care and notices that Nurse Leah (N6) is watching the doctor closely: *She was right on that doctor's, gee, she was at his shoulder.* Joel has a wicked sense of humour, is able to chat about his favourite TV show: *It's that bloody Charlie that's on television at night now. You know, Two and a Half Men.* Joel exclaims about the fact that he had once been told he should be able to urinate into a bottle while lying on his back. When Nurse Leah (N6) tells him: *Nobody can pee like that.* He replies: *Thank you, the lying bastard,* referring to the person who had previously told him this was possible.

Joel's consultation is interrupted by noise in the corridor a total of seven times; and he hears many conversations about himself involving two or more people in his bedspace. Many of these discussions are between Joel's wife and either Doctor Surita (D1) or one of the nurses. The ethnographic observation and audio-recording of Joel's consultation are completed before Joel is taken for X-rays, thus

others would have been involved in his care while he was technically 'in the ED'.
Joel finally leaves the ED at 18.31pm and is admitted into the hospital.

Behind these consultation narratives is a staged, disciplinary and institutionalised system of care that is learned and (re)produced on a daily basis, as I outline below.

4.2. Working: a macro perspective on how nurses and doctors work collectively

The primary goal (and hence activity) of emergency clinicians is 'to know (about)' their patients, i.e. diagnose (the practice of diagnosis – from the Greek dia (through) and gnosis (experience knowledge)).[17] While diagnosing, nurses and doctors work to stabilise, care for and treat their patients. To do this they must ascertain what has happened to a patient to bring them into the ED. Based on this information, they must work out what is required to care for and treat them. Diagnosing involves (among other clinical activities) getting information by questioning patients (or others) – a standard feature of the medical diagnostic process. Treatment includes on-going monitoring (caring), and embodied knowing including gaze, touch, etc. Nurses and doctors also use technological evidence, notes and information based on the work of others, or information communicated (or not) from colleagues.

The similarities and differences between the staging of activities that happen in the various stages of Joel's and Jane Edna's consultations are detailed below. The resolution for each of them is very different: Jane Edna returns home and Joel is admitted. In Jane Edna's case, after seeing the results of the CT scan, the new doctor on duty, Edwina (D3), gives Jane Edna her disposition at 19.02pm and agrees to send her home, which takes another two hours to organise. Jane Edna finally leaves the ED at 21.15pm. Joel's disposition takes a somewhat different route. In Joel's case, his Junior Doctor Surita tells Joel he will be admitted at 4pm, but much earlier Joel recognises the armband as a sign that he will enter the hospital: *I don't like to see you put that on there 'cause it means I'm being admitted.* He is moved out of the ED to the ward at 18.31pm. Although Jane Edna's and Joel's presentations are different, as patients, their care is organised similarly as nurses and doctors triage, settle,

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[17] Doctors and nurses will resuscitate a patient as a first step if they are in a critical or acute situation, i.e. diagnosis is a component of this but will be a secondary task.

observe, monitor, treat and, as the term goes, 'dispose of' them to home or into the hospital, which they enact via the ED consultation.

The ED consultation is institutionalised sequentially into disciplinary segments. It begins when patients are assessed on arrival in EDs using the Australasian Triage Scale (Australasian College of Emergency Medicine 1993). This assessment system is based on five levels of acuity and urgency – according to which nurses and/or attending specialists allocate patients a Triage Category. Because neither Jane Edna nor Joel is in need of immediate resuscitation after triage (1), they go through the remaining three principal stages of care/treatment: (2) settling/admission; (3) initial history taking and examination; and (4) diagnosis, treatment/management (plan) and disposition (McGregor *et al.* 2010). With Joel, the settling/admission stage follows the initial history taking and examination stage, which occurs on some occasions.

As a linear process, the staged structures of managing patients by different practitioners can be diagrammatically represented as in Figure 5 (based on McGregor *et al.* 2010):

Nurses	Nurses	Junior doctors	Senior doctors
Triage →	Admission - settling the patient in →	Initial diagnosis and treatment plan →	Final diagnosis, treatment/management plan and patient disposition
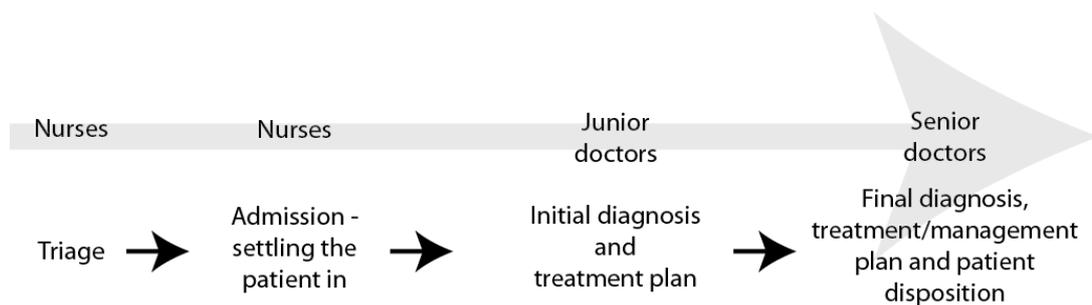
Figure 5: The stages of care in the ED

For almost all presentations, at triage, a specialist trained nurse and/or attending specialist sorts incoming patients using the Triage Scale noted above. Triage nurses are usually the first to find out the patient's story: pain, symptoms, allergies, previous history and reason for presentation. They add a triage category and a brief defining statement, which captures the key points about the patient's illness.

Staff nurses then settle and admit each patient in their area/room inside the ED. This involves changing patients into gowns, placing identity bracelets on them, documenting medications, etc.; they may do the admission after the initial history taking. Sometimes staff nurses at this point recheck the history, depending on the time available. Nurses also do basic observations including blood pressure, temperature, pulse, respiration and oxygen

saturation levels to begin building the next stage of the patient's medical care. They may initiate treatment, for example, organise pain relief. They work from the original triage notes; on occasion they have received a verbal handover.

In the acute section of the ED, the initial history taking and examination is the primary responsibility of the first (and sometimes only) consulting doctor. Often this is a junior doctor, who works under the supervision of a senior doctor, as part of a situated training program. Junior doctors take a comprehensive medical history, and examine the patient, which they will discuss with the more senior doctor. He or she will often use aspects of the patient's triage notes, to open a discussion with the patient: *So it was yesterday afternoon and you were passing these big clots, you were saying.* At other times he or she begins with an open question: *Good afternoon Denton. Hi, how – how are you going? My name is Surita here. I am one of the doctors. Tell me what brings you here today.*

The (junior) doctor may order tests (bloods, CT/X-ray scans, etc.) and pursue lines of investigation to establish an initial diagnosis (or hypothesis). He or she may also initiate treatment, if required. In the GP-like facilities of some EDs, patients' illnesses or injuries may be examined, diagnosed and/or treated by doctors with varying levels of seniority. Occasionally a senior nurse with advanced training, such as an advanced nurse practitioner, or a physiotherapist (if appropriate), can manage these 'house doctor' type consultations.

Staff nurses are scheduled to undertake regular rounds every hour (although this does not always happen), checking on patients, doing observations and monitoring throughout the consultation. It is in this stage that doctors and nurses are more likely to appear at the bedside together than at other times; however, even this is rare. Nurses do verbal handovers to each other but these can be very cursory or fleeting if the ED is busy. If handovers do not occur, they can use the written notes.

Finally a doctor establishes a provisional diagnosis (it is not always possible to reach a diagnosis) for the patient's presenting medical condition, a final ED treatment and/or management plan to decide on patient disposition. In this stage, senior doctors frequently re-question patients, and they review the initial hypothesis/diagnosis and the treatment/management plan made by the junior doctor. Senior doctors have ultimate responsibility for the treatment trajectory. Further or different treatment may be initiated. If the patient is to be admitted to the hospital, usually this involves 'selling' (Hitchcock 2012; Nugus 2007) the patient to members of in-hospital healthcare teams. If required,

staff nurses continue with their ongoing observations. Very occasionally doctors and nurses appear at the bedside together, but more usually nurses and doctors appear consecutively or asynchronously. Handover to others is both written (patient notes) and verbal.

Collective networking for Jane Edna's care

In Jane Edna's case, many practitioners share her care (as listed in Table 6 below). There are doctors directly involved with Jane Edna (D1, D2 and D3); ambulance officers (A1 and A2); nurses (N1 – N 7); orderlies (O1 and O2); others such as the radiographer, an unidentified male, a female staff member etc. (Z3, Z4, Z5, Z6, Z7, Z9); radiography nurses/staff (Ra1 rad, Ra2 rad) and an aged care nurse (C1). Doctor Louis (D1) is a central figure connected to a total of seven nurses (plus one specialised aged care nurse), many of whom are experienced ED workers. There is also one nurse in training who cares for Jane Edna. Table 6 lists the people involved in the knowledge network for Jane Edna as represented in Figure 6 below.

Key	Role	Roles and tasks in caring for Jane Edna
N1	Triage Nurse	First nurse who greets Jane Edna on her arrival in the ED
P	Patient	Jane Edna
Re1	Researcher	Myself
A1	Female ambulance officer	One of the two ambulance officers who bring Jane Edna into the ED
A2	Second ambulance officer	One of the two ambulance officers who bring Jane Edna into the ED
D1	Doctor Louis, male	The junior doctor who attends Jane Edna
N2	Nurse (Bella)	The first settling nurse
Re2	Researcher	The second researcher who relieves me over lunch
Z3	Male staff member (overheard in the audio-recording)	
Z4	Unidentified	Person who wants to borrow the ECG machine
D2	Doctor, male (staff specialist who is not part of the consultation)	The senior staff specialist on duty this day; he does not ever speak to Jane Edna but communicates with the junior doctor
Z5	Radiology practitioner	The radiology practitioner who takes the first X-ray in the resuscitation room
Z6	Female staff member (overheard in the audio-recording)	
Z7	Male orderly	A male orderly who moves Jane Edna
N3	Nurse (Noreen)	Nurse 3 is a senior nurse training N4
N4	Nurse (Cate)	Nurse 4 looks after Jane Edna throughout the afternoon
Z9	Male staff member (overheard in the audio-recording)	
C1	Aged Care nurse (Pamela)	The aged care nurse who spends a lot of time with Jane Edna and finally diagnoses her complaint
N5	Nurse (Peter)	Nurse 5 sees Jane Edna early in the day and then again much later
N6	Nurse that researcher calls who steps in to help with the monitor	Nurse 6 is just passing but is called in to check on Jane Edna who suddenly feels she is deteriorating
N7	Nurse who responds to bell	Nurse 7 is not a regular carer but responds to the bell
O1	Male orderly	The orderly who takes Jane Edna for her CT scan
Ra1 rad	Unidentified staff member in radiology	One of the staff in the radiology section
Ra2 rad	Radiography nurse	The radiography nurse
O2	Unidentified male in radiology and who returns Jane Edna to her bed after the X-ray	This is probably an orderly – he takes Jane Edna back to the main section of the ED
D3	Evening doctor, Edwina, female (doctor who gives disposition)	The new doctor who gives Jane Edna her final diagnosis and tells her she can go home

Table 6: Participants involved in Jane Edna's care: key roles and tasks

The people involved in Jane Edna's care gather information and generally care for her. There is also information located in objects (thermometers) and organisms (bloods), which are available for use by the attending doctor or nurse for any one patient. For example, nurses and doctors constitute and reconstitute their knowing about Jane Edna and Joel in a number of ways including locating and reading their previous notes, reading X-rays, asking history taking questions, carrying out physical examinations, doing observations, doing

ECGs, collecting blood samples, ordering CT scans and reviewing the results and medications they have brought with them.

I now examine how information and people are linked. Figures 6 and 7 below are the virtual networks of the social, clinical, artefactual and material relationships involved in Jane Edna and Joel's care. The knowledge network figures (introduced in Chapter Three) depict the web of clinicians who care for them, and who must connect (or not) to their colleagues and clinical data. These connections are shown through lines that connect Jane Edna and Joel to each person they interact with and objects (e.g. puffers) are also shown.

In Jane Edna's case, the different thicknesses of the lines articulate the strength of a connection, i.e. darker lines suggest a closer connection (more discussion between two people), whereas a dotted line signifies a textual connection. For example, Junior Doctor Louis (D1) might only see Jane Edna's CT scan result and not speak directly to the radiographer. Or a letter from the GP or the medical and nursing notes may connect the nurses and doctors to each other; or they may be connected through objects (X-rays, urine samples, etc.). Doctor Louis (D1) does not necessarily need to discuss his diagnosis/treatment plan with the seven nurses and with the one aged care nurse, but the potential to do so is always there. He does briefly give advice to several of the nurses at various stages during Jane Edna's consultation, although he only seeks assistance from them when he wants certain information such as the blood pressure reading, or when he seeks to know how much Anginine was given. Doctor Louis (D1) engages in selective interactions with disciplinary colleagues (Creswick & Westbrook 2008).

Figure 6 therefore charts a complicated and contingent (where individuals meet or do not meet in structured ways) network of people, things and objects. In Lazer and Friedman's work this would be called a 'random[ly] connected' network (2007). The lines connecting to Jane Edna also indicate, moving in an anti-clockwise direction, the sequence of practitioners who interact with Jane (explained below). In Jane Edna's case, Figure 6 also includes listings of objects such as the urine and blood samples as well, all of which make up knowing about Jane Edna.

By depicting each member of the clinical team who interacts with Jane Edna and with each other (either verbally or in writing) or via objects (e.g. ECGs, new notes, previous notes, puffers and X-rays, CT scans, blood and urine samples and results) in Figure 6, information about Jane Edna is fragmented (Bruni, Gherardi & Parolin 2007). This information is

sourced in different ways and at different times by the clinical team as the activity of care progresses. Bruni *et al.* prefer the term 'fragmented' over 'distributed' as this term 'shifts away from 'knowing-as-cognition' (seen as a mental activity) to knowing-as-a-situated-accomplishment that is something that people do together' (2007, p. 86).

At a macro level, the knowledge networks provide an abstracted and institutional view of the opportunities for action that the ED model of care sets up. By this I mean the way the consultation is organised and the nature of care (requiring individual and ongoing attention to 'the [de]composition of human bodies and of entities [e.g. blood samples and to other materialities such as patient information, space, time etc. in the ED]…are important determinants of [the] continuity and longevity [of its] practices' (Schatzki 2010a, p. 137)). The causal relationship between how care is organised, the materialities of ED care and its prevailing healthcare practices leads to, rather than brings about, (Schatzki 2010a) particular activities and actions by nurses and doctors, which I examine further in this chapter and in Chapter Six.
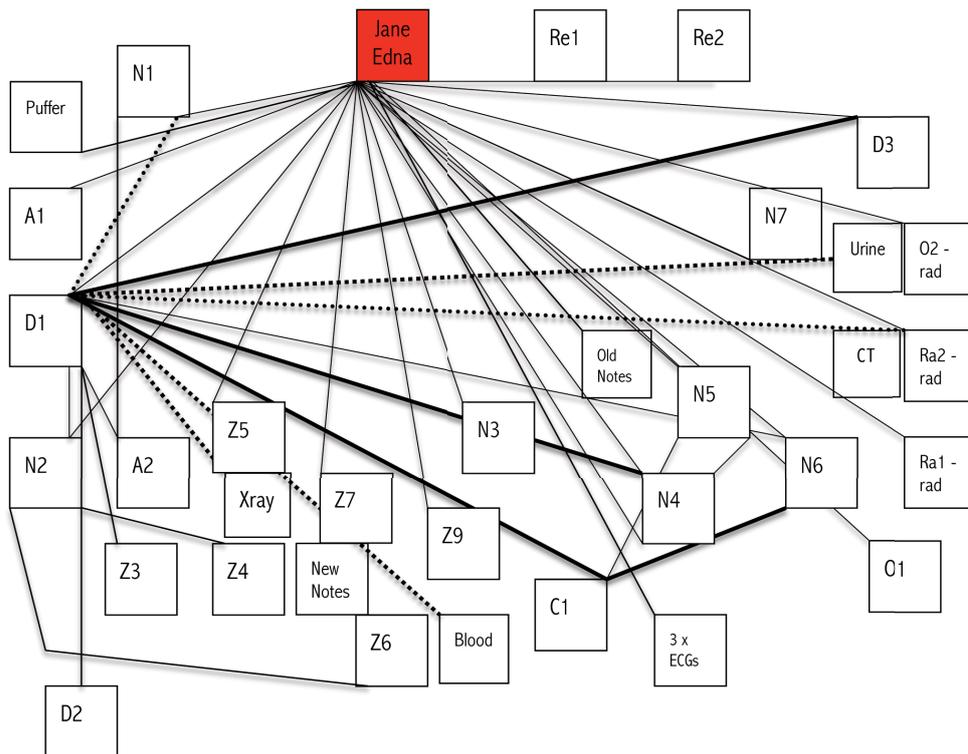
Figure 6: Knowledge networks for Jane Edna's 11 hour 15 minute consultation

See key below for code explanations on Figure 6.[18] In practice, not all the clinicians who connect to Jane Edna connect to each other; as such Jane Edna remains a central source of knowing for nurses' and doctors' work. Doctor Louis (D1) must also discuss Jane Edna with a senior doctor D2 (who is not recorded in Jane Edna's consultation) before a diagnosis can be given.

These participants and the objects in Figure 6 represent information available for use by Doctor Louis (D1) and the others. The momentum of Doctor Louis' (D1) evidence and that of the nurses builds a medical case that leads to diagnosis and disposition when after approximately nine hours, Doctor Louis (D1) hands over to the new shift's Doctor Edwina (D3) who gives Jane Edna her final diagnosis. It is not just the number of other people and objects that Doctor Louis (D1) relates to, and how often, that is important; it is that he must draw on this information as it contributes to and construct Jane Edna's case and diagnosis. In so doing, his actions and activities are made up of wide-ranging doings, sayings and beings, making up work practices.

Collective networking for Joel's care

In a similar way with Joel, the potential for knowing that is afforded by the networks of relationships and encounters is highlighted. Care is again distributed between several practitioners, listed in Table 7. There is the junior doctor directly attending to Joel, Doctor Surita (D1) and Doctor Leah (D2) who does not get to care for Joel; ambulance officers (Z1 and Z2 – and Z3 who does not take part in the consultation); nurses (N1 – N6); the researcher; tea ladies, in-charge nurses (N4/IC1, IC2); Nurse Paul (N7) who assists with the Schedule 8 drugs; the Communication Clerk (CC); Hospital A (one of the hospitals with details of Joel's previous care); PCT or Pall Care Team (Joel's Palliative Care Team); Joel's general practitioner (GP); the in-team oncologist; the Private Hospital where Joel has been treated before, and so on. Junior Doctor Surita (D1) is a central figure connected to a total of three nurses (particularly Nurses 2, 3 and 5) although other nurses, Nurses 1, 6 and

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[18] Each square depicts a person involved in Jane Edna's care or an artefact that made up a component of knowledge in the consultation, e.g. the puffer, the blood sample, etc. A line joining Jane Edna's red square indicates a direct encounter with Jane Edna, i.e. that person spoke to her directly; lines joining two squares indicate some kind of communication between people about Jane Edna; bold lines between clinicians indicate a number of discussions and suggest a stronger involvement together in her care. A dotted line indicates a written or artefactual link to clinicians, and includes patient notes, X-rays or CT scan results. Note that there may have been other encounters between clinicians about Jane Edna away from the bedside and therefore not observed, recorded or subsequently depicted.

7) are also involved in Joel's care. All of these are variably experienced: some are senior, others are in-training ED workers.

In Table 7 below, I list the people involved in Joel's care as represented in Figure 7.

Key	Role	Roles and tasks in caring for Joel
R	Researcher	
N1	Triage Nurse (Sharon)	The nurse who triages Joel
Z1	Ambulance officer, male	This is one of the ambulance officers who brings Joel in
Z2	Ambulance officer, male	This is one of the ambulance officers who brings Joel in
Z3	Unidentified male	
N2	Nurse (Janita)	The nurse who helps move Joel on the pat slide and is the first nurse to settle Joel
RN	Tina	The nurse who looks after Joel while N2 is at lunch
N3	Nurse (Nelly)	The nurse who takes over from Nurse 2
F	Jill (Joel's wife)	The carer who is a nurse and knows a lot about Joel
D1	Doctor Surita	The junior doctor who does the history taking and 'works up' Joel
D2	Junior Doctor (Leah)	The doctor who questions whether D1 has properly signed on to Joel
N4/ ICI	In-charge Nurse (Diana)	The in-charge nurse who is called to bring Joel a glass of water
IC2	In-charge Nurse	The in-charge nurse who gives a handover to IC1
N6	Nurse (Leah)	The nurse who spends most of the time looking after Joel
N7	Nurse (Paul)	The nurse who assists N6 with the scheduled drugs
Z4	Orderly	The orderly who comes to take Joel to the radiography section
PCT	Palliative care team	Palliative care team who form part of the consultation
CC	Communication clerk	Communication clerk who deals with the fax from previous hospital
GP	Joel's GP	Local doctor who doesn't take part in the consultation but is referred to
Previous specialists	Previous specialists	Previous specialists who are referred to in the consultation
Hospital A	Hospital A	Previous Hospital where Joel has been treated
In-team oncologist	In-team oncologist	Oncologist looking after Joel and under who he is admitted

Table 7: Participants involved in Joel's care: key roles and tasks

By depicting each member of the clinical team who communicates with Joel and each other (either verbally or in writing) or via objects (e.g. X-rays, previous notes), it is evident that information about Joel is fragmented (in different places) and sourced by the clinical team. Key decisions remain with Doctor Surita (D1), seen when he agrees to prescribe Oxynorm for Joel requested by Nurse Leah (N6):

N6   *Can we give him some Oxynorm before we (..)?*

D1   *Uuh*

F   *Yeah he'll get very dopey and but yes*

N6   *That's alright it'll ease the pain*

D1   *Mm mm ((indicating yes))*

Figure 7 below is a virtual network of the social, clinical, artefactual and material relationships involving Joel.
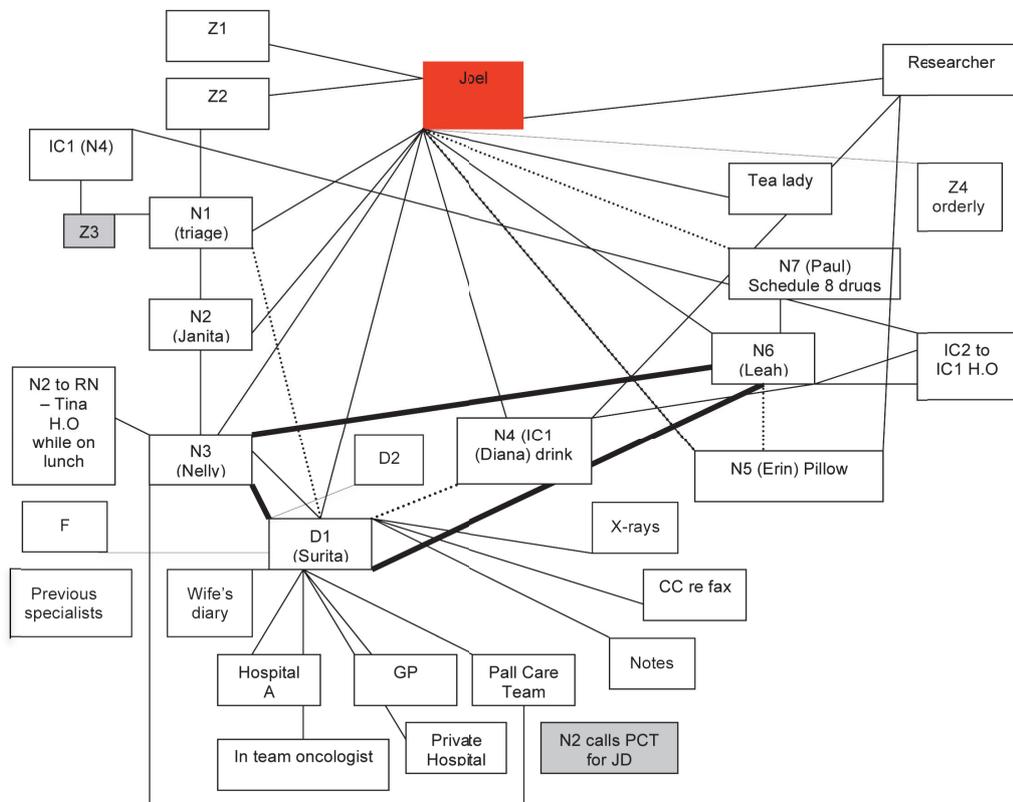
Figure 7: Knowledge networks for Joel's four-hour consultation

Note: Key as for Figure 6

Once again disciplinary divisions of labour reflecting differing statuses, roles and expertise are in place for the care of Joel. Doctor Surita (D1) draws on work from the palliative care team, Joel's extensive medical history, Joel's very knowledgeable wife (Jill) who presents a detailed four-year diary of his illness (although Doctor Surita (D1) uses her knowledge very reluctantly and contests what she knows on several occasions), previous X-rays and notes including those from his previous specialists. Doctor Surita (D1) slowly builds a medical case that leads to a disposition when after approximately seven hours Joel is admitted to the hospital. Doctor Surita (D1) must also discuss Joel's case with a senior doctor (who does not take part in Joel's consultation at the bedside) and Joel's wife, Jill, before this decision can be made. It is not just the number of other people and objects that Doctor

Surita (D1) relates to, and how often, that is important; it is that these encounters all contribute to and construct Joel's case and diagnosis, and in so doing they are made up of wide-ranging doings, sayings and beings, making up practices. The relationships among these different practitioners and objects are opportunities for knowing. I illustrate how this occurs below.

4.3. Working: a micro perspective of how nurses and doctors work individually

I now examine what happens when nurses and doctors work at patients' bedsides. Utilising Gherardi's metaphor of the 'texture of practice' (2006) I undertake a close analysis of how working practices are enacted and interconnected with objects, people and sayings and doings impacted on by spatial and material arrangements in the ED. Parallel clinical roles are undertaken by different nurses and doctors and in the practice/LE matrix (Figures 8 and 9) it is possible to see shifts in working.

Activities at the bedside: Figures 8 and 9

Figures 8 and 9 below, based on the practice/LE matrix (see also the visuals for Jane Edna's and Joel's full consultations in Appendix 5), illustrate visually how nurses' and doctors' knowledge is enacted through activity. By this I mean that the sequences of coloured squares, the concentration of differently coloured squares at different times in the consultation, the interspersed moves of Jane Edna and Joel in the ED space, the disturbances, etc. show, or allow me to 'see', aspects of how the overall diagnostic process is unfolding. These coloured squares represent people, objects, noise, sayings and doings, movement – underpinned by different events and knowing for Jane Edna and Joel. I present the practice/LE as a representation – linguistic, artefactual and disciplinary – of life at Jane Edna's and Joel's bedsides.

The concentration of squares of light green where nurses and doctors discuss procedures, or dark green where they talk about Jane Edna or Joel, change over time in the consultation, as does the involvement of Jane Edna and Joel (see Appendix 5). Nurses are depicted differently from doctors, ambulance officers, radiographers and patients – and the sequence of squares usually conveys a difference in the content of their encounter, their 'sayings' *qua* 'doings' (Gherardi 2008). For example, light green squares indicate when

nurses and doctors (or nurses and carers) talk about procedures and processes; while bright green squares indicate when they discuss Jane Edna or Joel. Further analysis of the squares through the discussion below indicate who is involved in talking about or to Jane Edna or Joel, as well as the kind of working that is going on.

Jane Edna's consultation is an 11-hour event situated in a particular setting, the ED, at a particular time. Jane Edna finds herself in an interactional, disciplinary, auditory and material landscape – involving objects, movement, things and people. Through this visual the magnitude of activity in Jane Edna's consultation becomes visible.

Because Figures 8 and 9 represent doings, sayings and other events at the micro level of practice, this provides a particular lens on working practices in the ED (these can be compared, for example, with understandings afforded by the knowledge networks introduced above).

History-taking, examination, treatment - interactions, people, space, things

Move to triage room	Curtains	Dist	D1 52 history taking	N2 D1 61	D1 70	N2 & Re1 79	N2 87	N2 & D1 95	D1 103	D2 & Z5	Z5 113	N2 & R 119

113 N2 & R 119 — 119
114 N2 120 — 120
115 Re1 & N2 121 — 121
Dist X-ray next patient
116 D1 122 — 122
D1 & N2 123 — 123
117 Voices
D1 & N2 124 — 124
118 N2 125 — 125

Z5 113
D1 114
108 Z5 115
109 Voices
110 D2 116
Voices
111 X-ray 117
Voices
112 Re1 118

103 D2 & Z5
Artefact X-ray
104 R & Z5 108
D1 109
105 R & Z5 110
Loud Voices
106 Z5 & D1 111
Loud Voices
107 D1 112

95 — D1 103
96 — Dist noise & voices
97 — D1 104
98 — Dist Voices other patient
99 — D1 105
100 — Dist machines, voices & ...
101 — D1 106
102 — Dist loud voices
Z4 & N2 107

87 — N2 & D1 95
88 — N2 & Z3 96
89 — N2 97
90 — R & N2 98
91 — Re1 99
D1 cannula 100
92 — N2 & R 101
93 — D1 102
94 — Dist

79 — N2 87
80 — D1 Meds 88
81 — N2 & D1 89
82 — D1 90
83 — N2 & D1 91
84 — Dist, phones, voices,
85 — N2 92
86 — D1 & N2 93
P 94

70 — N2 & Re1 79
71 — D1 80
72 — Z3 & D1 81
73 — D1 82
74 — D1 & Z3 83
75 — N2 84
76 — Dist (phones)
77 — D1 & other 85
78 — D1 meds 86

61 — D1 70
62 — N2 71
63 — D1 72
64 — D1 N2 73
65 — D1 Exam 74
66 — N2 & D1 75
67 — D1 & N2 76
68 — R & N2 77
69 — D1 & Rad 78

52 — N2 D1 61
53 — N2 62
54 — D1 63
55 — N2 & D1 64
56 — N2 65
57 — D1 66
58 — N2 67
59 — D1 68
60 — N2 69

44 — D1 52 history taking
45 — Z1 & D1 53
46 — D1 54
47 — D1 & N2 55
48 — D1 56
49 — N2 57
50 — D1 58
51 — D1 & N2 59
D1 60

35 — Dist
36 — N2 44
37 — D1 & Z1 45
38 — N2 46
39 — A1 47
40 — A1 & D1 48
41 — N2 49
42 — D1 & Z1 50
43 — N2 51

27 — N2 35
28 — Z1, D1 & N2 36
29 — D1 & Z1 37
30 — N2 38
31 — Z1 & D1 39
32 — N2 40
33 — A1 & D1 41
34 — N2 42
D1 & A1 43

22 — Curtains
23 — N2 27
24 — A1 & N2 28
25 — A1 29
N2 30
A1 31
N2 & A1 32
Z1 & D1 & N2 33
26 — P 34

Move to triage room
Z1 & N1 22
Dist
N1, A1 & R 23
Re2 & N2 24
A1 & A2 & N2 25
Artefact
UM
A1 26

Figure 8: Working at Jane Edna's bedside: history taking

Working at Jane Edna's bedside

When Jane Edna arrives at the ED she is triaged in the ambulance bay (not shown in Figure 8) and then moved into a resuscitation room as there is no space in the acute section of the ED. This move is the first red square prior to square 22 – I did not number relocations. Nurse Noreen (N3) who attends to Jane Edna later in the consultation misunderstands her visit to the resuscitation room and for Jane Edna, this is the first contingency she faces. The ambulance officers move Jane Edna off the stretcher (square 28) with Nurse Bella's (N2) assistance (square 30). In the resuscitation room Jane Edna meets Nurse Bella (N2) for the first time (square 30) and then Doctor Louis (D1) who speaks to Jane Edna directly (at square 52), although D1 is present in the room earlier, from interaction (square 33).

While A1 is handing over to Nurse Bella (N2) (square 36), D1 interrupts this conversation to clarify what A1 has just said (square 37) to Nurse Bella (N2) (square 36). From here, it is evident that D1 takes over the talk with A1 and they exchange some information about Jane Edna while Nurse Bella (N2) continues setting Jane Edna up to do an ECG. This pattern continues with A1 and D1 exchanging information about Jane Edna, with Nurse Bella (N2) talking directly to Jane Edna from time to time, until A1 asks Jane Edna directly at (square 47) how old her spray is.

Junior Doctor Louis (D1) first greets Jane Edna at square 52; after some initial questions D1 is interrupted by A1 at square 53, who offers some information on Jane Edna's spray. D1 takes up his conversation with Jane Edna again after this interruption (square 54) – see below – and soon Nurse Bella (N2) interrupts D1 (at square 55) asking D1 where she can place something. D1 begins talking to Jane Edna again (square 56), when Nurse 2 interrupts and speaks directly to Jane Edna (square 57), asking her to move her arm down:

D1	Okay and did it give you _any_ relief?
N2	((whispering to D1 as she interrupts his question)) Where can I put this?
P	Yes it did give me relief
D1	Okay
N2	Sorry just need your [arm down for a minute ((interruption by N2))
P	[I just got fed up with having to use it all the time ((Jane Edna continues talking to the doctor))
D1	Now what – what _kind_ of chest discomfort was it? Can you – can you just describe it to me?
P	It's hard to describe um
D1	Is it a ==?
P	== It's a _dull_ one.

There are a number of disturbances and other interruptions during the history taking and after the examination, 21 disturbances in all, including noise from a man fixing curtains alongside Jane Edna's bed. D1 is on the telephone twice during the period of history taking, once when he makes a call to the radiography section to organise an _in situ_ X-ray for Jane Edna (square 78), and another time when he takes a call from a colleague who is at another hospital (square 85). There is a lot of noise around Jane Edna; halfway through her time in the resuscitation room another patient comes into the same space. This second patient also has an X-ray taken, after the radiographer has taken an X-ray of Jane Edna. A senior doctor in the room at the time takes advantage of the presence of the radiographer to do the X-ray of the other patient – a dynamic and situated contingency that allows him to find out more about the other patient.

The visual analysis of what goes on in this history taking depicts a busy, noisy environment and a complex consultation. Jane Edna is in the ED five days before Christmas and hears something, which she partly recognises as festive: _Is there a party going on here_ she asks. The disturbance is in fact children singing to the patients. I also participate in Jane Edna's consultation; I engage in interactions with her on 59 occasions. Maintenance people, tea ladies, passers-by and visitors are all part of the context – on this day it is children from a nearby school. However, from a professional point of view, Jane Edna's history taking is less complicated than Joel's move onto his bed, which I examine below.

In the history taking, Doctor Louis (D1), although interrupted by noise and by Nurse Bella (N2), has a relatively straightforward discussion with Jane Edna. Jane Edna only initiates a question to him once (square 94). Doctor Louis (D1) and Jane Edna's role relationship (doctor-patient) is relatively untroubled and this contrasts markedly with Joel's consultation below.

In Joel's consultation, Joel's wife, Jill, contests the expertise of junior Doctor Surita (D1). In addition in Joel's consultation, Joel reacts to Nurse Janita's (N2) actions and the complexity of her working with the ambulance officers and Joel's multiple initiations as a patient are evident.

Working at Joel's bedside

Arrival, triage and move to bed - interactions, people, space, things

R 1	1 R & Z1 10	10 Z2 18	18 R 27	27 Z1 36	36 Z2 45	45 Z1 54	54 N2 63	63 Z2 & Z1 72	72 P 81	81
N1 2	2 N1 11	11 R 19	19 Z1 & R 28	28 R 37	37 Z1 46	46 Z2 55	55 Z2 & N2 64	64 N2 73	73 N2 82	82
R 3	3 Z1 & R 12	12 P 20	20 P 29	29 N1 38	38 Z2 47	47 P 56	56 P 65	65 Z1 & Z2 & N2 74	74 Z1 83	83
Z1 4	4 N1 13	13 P 21	21 Z1 (30)	30 Z2 & R 39	39 Z2 & Z1 48	48 P 57	57 N2 66	66 Z1 75	75 N2 84	84
N1 5	5 N1 & Z 14	14 R 22	22 Z2 31	31 R 40	40 Z1 49	49 N2 58	58 P 67	67 N2 76	76 Z2 85	85
Z1 6	6 Patient is moved	Z1 23	23 R 32	32 Z1 41	41 R 50	50 Z2 & Z1 & N2 59	59 Z2 68	68 Z2 77	77	
N1 7	7 R 15	15 Z2 24	24 P 33	33 R 42	42 N2 & Z2 51	51 N2 60	60 N2 69	69 N2 78	78	
Z1 & N1 8	8 Z2 & Z1 16	16 Z2 25	25 Z1 34	34 Z1 & R 43	43 Z1 52	52 Z2 61	61 Z2 & N2 & Z1 70	70 Z1 79	79	
N1 9	9 P 17	17 R & Z1 & Z2 26	26 Z2 35	35 Z1 44	44 Z2 53	53 P 62	62 N2 71	71 Z2 80	80	

Figure 9: Arrival at the ED and move to the bed for Joel

The part of the consultation I have selected for Joel is very different from Jane Edna's. Joel is a lot more unwell than Jane Edna. In addition, in the extract, reflected in Joel's encounters (above in Figure 9 and in Appendix 5), there is interprofessional conflict, as Joel is triaged, moved and then lifted (painfully) on to a bed in this extract. Nurse Janita (N2) who hurts Joel as she moves him apologises to him afterwards. The move onto the

bed is very tense, and takes place soon after Joel arrives at the ED. Although the texture of practice remains the same, there is a different picture of activity.

During this early stage of Joel's arrival at the ED, N1 (the triage nurse) takes his temperature and then tells the ambulance officers they can move Joel to bed 19. Moving Joel onto his bed becomes a difficult undertaking as Joel feels terrible pain principally as Nurse Janita (N2) moves his leg. In the move on to the bed, there are constantly shifting interactions between the two ambulance officers and Joel: they also banter about the crutches and other equipment.

When Joel arrives in the ED, he is approached by N1 to see if he consents to being part of the research (not shown in Figure 9). N1 explains what being involved in the research will mean to Joel and he agrees to take part (square 1). I, as the researcher, approach him and let him know that I'll be with him for the whole day. Joel makes a joke about his real name and tells us his preferred name, but for the rest of his consultation, the nurses, doctors, ambulance officers and I call him by his first, but not preferred name.

N1 begins the triage at popping a thermometer under his arm (square 2) followed by checking his current chemo or radiotherapy (square 5). N1 and Z1 discuss his mobility and I interrupt to ask Z1 if he minds being recorded (square 10). Nurse 1 (N1) interrupts the talk with the ambulance officers as she has forgotten to ask about Joel's pain levels for her triage notes (square 38). Joel replies that he only feels pain on movement but has none while he is lying there. Z1 (the ambulance officer) then starts to explain to Joel how they will move him over on to the bed, but soon they decide they need *another pair of hands* and they call Nurse Janita (N2) who agrees to help. Just before she does assist she must finish something else. It is here (at square 57) that interconnected doings and sayings, and especially Nurse Janita's (N2) relating or being, reveals the complexity of this undertaking. As Nurse Janita (N2) enters the room, Joel, who knows this move will be painful, says to her proactively (square 59):

P   *Are you a leg holder?*

Z2   *Yeah, just to make sort of [general …*

N2   *[Ah that's just one of my specialties*

Z2   *Doing the (..) very painful*

Nurse Janita (N2) moves Joel without allowing for a proper briefing from the ambulance officers who are trying to tell her that Joel will be in pain if she moves him. When Nurse

Janita (N2) touches Joel (moves him) he yells and stridently says (square 62): *No don't you move that leg* which he follows up after the others had discussed his pain (squares 59-61): *You're about to grab that and just jerk it* (square 65).

Jane Edna's and Joel's consultations take place in different hospitals on different days. Their presentations are completely different, emphasising the unique circumstances of each of their illnesses. In practice terms, the nurses' and doctors' work is similar: they carry out similar sayings, doings and beings and activities across both consultations: they are right there next to Jane Edna and Joel, they talk to them, they rely on protocols and they work with objects and colleagues; they have perceptions and goals for their patients and make assumptions about their illnesses and injuries.

4.4. The model of information transfer in the organisation of the ED consultation

The macro and micro perspectives above illustrate who is permitted to be involved, who is sanctioned to do disciplinary tasks, how the consultation is set up, what the material arrangements are, what the roles and statuses of nurses and doctors are. Although each ED consultation will have different configurations of people, overall the organised system is established in the same way.

For example, at the macro level, in Jane Edna's consultation, multiple practitioners include eight nurses, three radiographers and one junior doctor. Work is mobile – nurses and doctors must network with each other and Jane Edna as they navigate the material arrangements of the ED space. Jane Edna herself moves around (from the resuscitation room to bedspace 10; to radiography and back; to the toilet and back). The nurses and doctors themselves move about between her bed and the equipment, work station, tea and lunchroom, X-ray screen and so on.

In the current paradigm of ED care, as introduced in Chapter Two, patient and treatment details, and what to do with these, i.e. the individual, disciplinary and collective knowing of doctors and nurses in caring for Jane Edna, are understood as a cognitive possession of either the individual nurse, or doctor or team or as a fixed detail in Jane Edna's or Joel's notes or on the computer (Nicolini *et al.* 2008). The model of care in reality then relies on the strength and security of information transfer between clinicians either through handovers or patient notes. The actual (what happens *in situ*) and potential (what is ideally

possible) for the mutual understanding and timely transfer of information by examining what each individual nurse or doctor 'knows' – at any one time – and whether or not this becomes team knowledge – is conventionally the key to understanding the overall quality and safety of care for Jane Edna and Joel.

The model of care is therefore conceptualised in a linear sequence of stages, premised on a model of information transfer. This model involves networking between clinicians, communicating and doing clinical work at patients' bedsides and beyond. Information is seen as a contained, fixed 'virtue' (Yamauchi 2006) with a focus on the reliability of the message system between individual communicators, their teamwork and handover protocols. The emphasis is on this information being transferred and communicated between clinicians. This places a reliance on memory, on concentration, on synchronous, positive collegiate relations and on mutual understandings of particular forms of information/evidence/knowledge.

In Table 8 below I present the overall stages of Jane Edna's and Joel's consultations. In Jane Edna's and Joel's consultations, both the macro organisation of the ED and the micro doing of knowledge are clear and comparable. The disciplinary stages afford opportunities for nurses and doctors to work in particular ways, and the interactions, staffing, movements – the constituting and reconstituting of knowledge – are evident in both columns of Table 8.

Jane Edna, 95-year old blind patient (lower epigastric and chest pain)	Joel, 67-year old under palliative care, (metastasised cancer in thigh bone)
Triage, encounters (1-20) [19]	**Triage**, encounters (1-14) and again at (38)
	Moving Joel to bed, encounters (15-85)
	Settling into bed, encounters (87-151)
History taking, examination and the beginning of the investigations, encounters (22) to (125)	**History taking, examination** and beginning of investigations, encounters (160-226); then again at 239-247); then again at (286-296); then again at (339-370); then again at (474-528); again at (530-531); again at (588-596)
Settling and successive observations, encounters (152) to (175) take place when Jane Edna is settled into her bed and undergoes successive observations	**Settling and successive observations** at (249-279); then again at (299-340); (354-358); again at (572)
Admission, encounters (187-190) although Jane Edna is not admitted	**Admission**, encounters (364-385); then continues at (392-470)
Radiography visit, encounters (263) and (293) occur when Jane Edna is relocated to and from radiography	**Radiography** visit, encounters (577-587)
Pre-**diagnosis** and subsequent ECG, encounters (310) to (356) when Jane Edna re experiences pain	Joel's problem remains undifferentiated, although the medical notes read 'Final **diagnosis**, increase in pain due to new metastasis'
Final **diagnosis**, encounters (408) to (410). Jane Edna is told she can go home and returns to her hostel at around 9 pm	Joel is told he will be admitted under one of the oncologists at 4 pm

Table 8: Clinical stages of Jane Edna's and Joel's consultations

Although nurses' and doctors' working practices are structured by the disciplinary stages of the consultation as shown above, individual and collective knowledge and knowing are non-linear: the simple transfer of information about Jane Edna and Joel within the disciplinary stages is not what transpires in practice.

4.5.   What happens in practice?

In Table 9 below, I illustrate that although notes have been transferred and handovers have taken place, the reliability of the model of information transfer is challenged by the findings. Thus, despite the superimposed linear organisation of the consultation, knowing is neither a linear nor a fixed process, and the summative data show at a glance that the transfer of information between nurses and doctors is not simple or unproblematic.

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[19] Encounter numbers in Table 8 are predominantly related to the content of talk between clinicians and the patients and therefore the focus is on work related to the clinical stages. Therefore if there are gaps in the numbering of the encounters in the clinical stages of care, these gaps might be related to other activities or actions going on around the patient that I have not included here.

Individual and team knowledge (based on the transfer of information) are not securely possessed.

Working/knowing at the bedside	Jane Edna	Joel
Attending clinicians	Total care involving 22 clinicians and others, 9 roles	Total care involving 6 clinicians and others, 6 roles
Length of ED consultation	11 hours 15 minutes	7 hours 2 minutes
Visits to the bedside by different clinicians	51 visits	39 visits
	11 visits by D1	12 visits by D1
	40 visits by nurses	27 visits by nurses
Multiple activities and actions at the bedside	History taken by D1, checked by N4 and a little by C1	History taken x D1, checked by N3 and more fully by N6
	Notes required x 5 times	Notes required x 4 times
	Allergies checked x 10; temperature taken, blood pressure checked; JE assisted with going to the toilet	Allergies checked x 4; temperature taken, blood pressure checked; J assisted with going to the toilet
Spatial relocations	Jane Edna is moved 3 times	Joel is moved 3 times
Clinical procedures conducted	3 x ECGs, 1 X-ray, 1 x CT scan, 2 x bloods	1 x ECG, 1 x X-ray, 2 x bloods
Knowing as activity	D1 rules out a problem with Jane Edna's heart, congestion, *'something like a blockage'* in her abdomen, a clot in the lung and a problem with her thyroid function and she is treated for *'acids in her tummy'* and chest pain	D1 treats Joel for pain; but staff confuse his pain/mobility x 8 times
Information is forgotten	Information forgotten numerous times (Jane Edna's previous medication; her allergies; that she is blind)	Information forgotten numerous times (Joel's medications; his allergies; the primary site of his cancer)
Information is confused	Information confused by several clinicians on different occasions (Jane Edna's name; whether she's had, or is going to have an X-ray or a CT scan; whether she is nil by mouth)	Information confused by several clinicians on different occasions (Joel's name; his pain and his mobility; whether he's on Flucloxacillin; when he was first diagnosed; what his dosages are)
Patient details are confused	Name mistaken x 12 times (although D1 interchangeably uses one name with the other – on at least 8 occasions he uses the right name)	Name mistaken x 11 times

Table 9: Non-linearity of knowing at the bedside

How do the working arrangements of the ED consultation contribute to this non-linearity and loss of information?

Firstly, the way the consultation is organised (in stages where care is distributed between many people) fragments what is known about certain aspects of Jane Edna's illness or where the team is up to in caring for her, at any point in time. For example, there are details about her care in the notes that the doctor has misplaced or left at the workstation; there are details in Nurse Peter's (N5) head momentarily before he writes down the results;

or there are details in Nurse Pamela's (C1) chart or in the X-ray, which is delayed in radiography.

From the network diagrams presented above it is clear that as a collective, not all the clinicians who connect to Jane Edna and Joel connect to each other. This illustrates the contingent nature of the connections between attending doctors and nurses. While there are usually more connections between the main junior doctor in each case (D1) and usually one staff nurse, there are also multiple handovers between her or him and the triage, radiography and orderlies, for example. There are discontinuities when shifts change (in Jane Edna's case the handover says she was in 'resusc'); when lunch or toilet breaks are taken, when urine samples are left on chairs (in Jane Edna's case), when notes are relocated or delayed, and/or when nurses and doctors are interrupted and called away by other emergencies. In Chapter Six I examine in detail how fragile the network links are as nurses and doctors rely heavily on patients to refresh what they need to know rather than on notes and handovers. Yet, weak links between patients, nurses, doctors, GPs and radiographers may not in themselves be a problem as Granovetter's paradoxical finding suggests, i.e. that information flows more effectively when groups are connected through weak ties (1973, 1983). On the other hand, if there are strong links, i.e. even if nurses, doctors and others do communicate more frequently, they do not necessarily learn from each other and knowing is not always accomplished, as I examine in Chapter Five.

The practice/LE matrix illustrated that at the micro level, nurses and doctors work closely with Jane Edna, objects and occasionally with each other and together the care of Jane Edna unfolds, but not necessarily smoothly. For example, at this micro level, information is not always communicated or sought – as discussed in Joel's case with Nurse Janita (N2). Yet working in the ED must occur through the networks of relationships, space and materialities. But once again the way the consultation is organised in space and time poses difficulties with the transfer of information.

Secondly, many objects in the material arrangements of the ED are mobile and dispersed. Nurses and doctors must locate patients, notes, stickers, medical records, beds, carers and other clinicians when they need them. These objects and people and they themselves – individually and as a team – are continually moving across the space of the ED. Information may be (like the nurses and doctors) geographically scattered, nomadic and untethered. This mobility poses challenges for knowing and for communicating with others

(McIlvenny, Broth & Haddington 2009). Jane Edna and Joel are moved several times during their ED stays; they too navigate the territory of the ED.

Because of this mobility, nurses and doctors must connect to and interact with each other and objects in the space of the ED, occasionally at the bedside and away from it. What transpires away from the bedspace is different from what transpires at the bedside. For example, the space away from the bedside is where Doctor Louis (D1) speaks to his more senior doctors; Nurse Noreen (N3) too must find Doctor Surita (D1) away from the bedside – this impacts on her interactions with Joel, as she first has to leave him, and must then return. Nurse Bella (N2) must also find the IV pole – this takes her away from Jane Edna's bedside and she needs to reconnect with her when she returns.

Thirdly, specific working arrangements (space, beds, time, shift changes, information-seeking needs, disciplinary and care factors) result in 90% of communication in the ED between colleagues being face-to-face (Coiera *et al.* 2002). Different studies have shown that the nature of these interactions can be opportunistic (Long, Iedema & Lee 2007) or intentional (Reddy & Spence 2008; Yamauchi 2006). More generally, because of the exigencies of acute care, there is evidence that interactions with patients and colleagues now take place more quickly than ever (Crawford & Brown 2011) and my data (which I will present in Chapter Six) show that reconstituting knowing with patients and colleagues is recursive and circular, thus interactions occur again and again.

Finally, time plays a key role in the non-linearity of knowing. During the long hours that patients are in the ED, urgent and acute care and knowing are therefore interconnected – 'time plays a central role in the way the ED works, both as a resource and as a phenomenon' (Manidis *et al.* 2009). Over time nurses, doctors and patients forget, confuse and misplace patient details.

In summary, as nurses and doctors work, at the macro and micro levels, spatial, temporal and interactional issues – including mobility – impact on the ways that care is experienced (by patients) and enacted (by clinicians) (McIlvenny, Broth & Haddington 2009). The knowledge networks, the practice/LE matrix and the way that information is transferred (or not) remembered (or not), renewed (or not), illustrate how knowing and the activities pursued there depend 'on the physical arrangements that exist there and practices [that] are carried on amid or in relation to those arrangements' (Schatzki 2009, p. 37).

The consultation and work are organised in ways that rely on multiple participants of different statuses with roles distributed among them and they enact practices amid 'a complex of linguistic and nonlinguistic actions, thoughts, and readinesses' (Schatzki 2006, p. 1869). Mobility, space and time render knowing as non-linear and random, yet nurses and doctors bear the responsibility of networking with each other to 'transfer' patient and situational information, which must be used knowledgeably to care for them. As ED healthcare knowledge is (re)produced, individual members of the clinical team, information, objects, people and interactions are woven together through practices.

4.6.   Working practices – connecting through activity

At the macro level, the knowledge networks illustrate that knowing and practising with Joel, for example, comprise what Joel and Joel's wife do and say, what the palliative care team have done and said, what the X-rays show, what the previous notes say, what the talk between Doctor Surita (D1) and Joel reveal. The knowledge and work of the specialists, the senior doctors and Jill complement Doctor Surita's (D1) and Joel's knowledges. During Jane Edna's visit she invokes her previous doctors – specialists, GPs – her previous ED visits, her earlier test results and so on. These all weave together to create threads, or lines of knowing, that make up knowing in this 'system of fragmented knowledge' (Bruni, Gherardi & Parolin 2007).

At the micro level, the encounter squares depict the summative activities of Doctor Louis (D1) 'doing' history taking, examining Jane Edna, organising an X-ray and inserting a cannula, while talking, using equipment and moving through space and time alongside Nurse Bella (N2), Jane Edna (P) and the ambulance officers (A1 and A2). These are multiple actions forming a net of different activities, but all involved in the practice of (re)producing healthcare knowledge. Utilising Gherardi's notion of 'texture' has shown visually the interconnectedness of knowing, which as a texture is tangible, material and emergent, and which shows the shape, size, arrangement and proportion of the way that knowing is constituted and reconstituted: the situatedness is multiple and layered.

Information while primary to ED care is accessed and worked with, not in primary ways as a straightforward linear process (in handovers, for example), but in secondary (even underground) ways. By this I mean that as nurses and doctors work with patient (and other) information as part of their knowing, it is dealt with in practice through individual,

collective and iterative sayings and doings that layer objects, people, space and time through activity. The information itself, and the information transfer processes, reveal that there is not necessarily a linear relation between information and action – knowing 'extends beyond what is useful or strictly instrumental' (Gherardi 2006, p. 12).

One of my principal intentions here is to introduce the practice theory concept that I elaborate on in Chapter Six, which is that it is not just one activity – i.e. communicating between nurses and doctors and/or between nurse, doctors and patients; inquiring as part of diagnosis; doing observations; adhering to rules and protocols of care that are disciplinarily-based – that will impact on Jane Edna and Joel's safety and experience. Rather it is the way that each practice, activity or action is interconnected with every other practice and with the objects, other people, material arrangements and organisational schedules of ED care – the organisation of these activities – that will ultimately impact on the safety and experiences of patients. Multiple activities and actions are implicated in the practices that are the 'action-net sustained by a knowing-in-action' (Gherardi 2009, p. 352).

The organisation of disciplinary and institutional sequences of care for Jane Edna's and Joel's consultations is not a one-off experience: they are subject to prefigured work. Like every other patient in the study, as Jane Edna and Joel arrive at the ED, they slot automatically into the organisational momentum of care, embedded in and enacted through the unfolding of relentless and repetitive clinical and organisational practices, perpetuated by 'the organizational memory' made up of the 'sum of practice memories' (Schatzki 2006, p. 1870) of nurses and doctors in each ED.

Jane Edna and Joel also experience the unique configurations of people, space, time and materialities of their consultations amid which knowing emerges on the day. Like all the patients recorded for the study, they have their presentation symptoms ascertained and their personal details taken; they are both triaged; seen at some point by a (several) nurse(s); they join just over half (51%) of all patients in the study in seeing one or more doctors; (11% are seen by more than two doctors); and like all patients, they spend time alone – where they are left unattended (waiting times) in their consultations. Nurses' and doctors' activities and actions unfold in recognisable ways for them as they do for the remaining 80 patients across all five EDs in the study.

4.7. Concluding comments to Chapter Four

In Chapter Four I introduced Jane Edna and Joel as the thesis case studies. I examined how the stages of care were (re)produced at the macro level in both consultations organised through staffing, roles, statuses and disciplinary tasks.

The macro view analysed how nurses and doctors worked collectively and the micro view examined what nurses and doctors did, mostly individually, at Jane Edna's and Joel's bedsides.

I presented the *in situ* challenges of information transfer and knowing in the current ED model of care. I discussed how mobility, space and time rendered knowing as non-linear and random. Yet in the current model of care, nurses and doctors bear the responsibility of networking with each other to 'transfer' (patient and situational) information.

I proposed that from a practice theory perspective, knowledge could be understood more usefully as located in the flow of praxis (Schatzki, 1996, p. 13 in Shove, Pantzar & Watson 2012, p. 4), i.e. through activity and not principally in fixed records or practitioners' minds as is assumed in conventional approaches. I concluded, however, that both the macro and micro level analyses indicated nurses' and doctors' work as defined by work that is staged in disciplinary and institutional ways, maintained through practice memories and practice knowledges – ways of doing, understanding, seeing and organising, i.e. practices as presented in caring for Jane Edna and Joel.

Chapter Four focused on working practices. In Chapter Five, I examine how nurses and doctors learn and (re)produce their disciplinary and institutional activities. I examine arrangements for learning practices, prior to and in the ED, exploring the multiple opportunities for learning and how these are connected to the teleoaffectivity of practices and practising.

Chapter Five – Learning practices

Purpose and flow of this chapter

In Chapter Five I connect working practices, examined in Chapter Four, to learning. I outline the professional formation of nurses and doctors prior to working in the ED, followed by an analysis of some of the ED's pedagogic functions as understood by the disciplines of medicine and nursing and the health system. I then examine learning opportunities (implicit and explicit) afforded by the institutional and disciplinary arrangements of care in the ED.

I present selected disciplinary activities and actions in Jane Edna's and Joel's consultations, drawing on practice theory understandings of how practices are learned as nurses and doctors participate in them. I show that as opportunities for learning from each other arise, these are missed as doctors and nurses remain attached to their practice knowledges and contest each other's legitimacy as knowers and the legitimacy of patients as knowers.

I conclude that attachments to practice knowledges render learning as emergent and past and future-oriented, a tension central to understanding practices as collective, extra-situational and extra-individual (Kemmis 2009). As nurses and doctors learn institutional and disciplinary practices in the timespace of the ED, they learn ways of doing, saying and being that are steeped in a relational and epistemological paradigm of work that is historical. Even though nurses and doctors (and patients) communicate with each other at appropriate times and places, learning across disciplinary and patient/doctor boundaries and transferring information (to be used knowledgeably) across these boundaries remains problematic.

5.1. Connecting working, learning and knowing

In Chapter One I outlined how working, learning and knowing might be connected. I pointed out that there are several views on how learning, working and knowing might be related to each other, suggesting complex connections and understandings. Particularly in work settings, Hager (2011) has outlined the development of workplace learning theorisations that have shifted from psychologically-based theories, to sociocultural approaches and then to postmodernist theorisations, warning that reductionist views of

how learning occurs or how it might be related to work and formal pedagogies, should be avoided. Hager says workplace learning researchers are still grappling with a number of issues, including: whether individual learning is the best unit of analysis when examining learning in a workplace setting; how learning is seen as a product or 'thing'; how learning might be understood independent of the context in which it takes place; and finally, the emergent nature of learning (Hager 2011). These four issues arise in this study.

Taking a practice-based perspective and drawing on other sociocultural conceptualisations of learning and working (Hager 2011), I proceed on the basis that working, learning and knowing are situated and embodied phenomena with learning taking place in multiple ways – collectively, individually, developmentally, formally, informally – through participating in practices (Gherardi 2008; Lave & Wenger 1991; Schatzki 2002; Strati 2003, 2007), and also through engaging in pedagogical arrangements *in vacuo* or *in situ*.

Structure of Chapter Five

Analysing learning as a product or 'thing' as noted above is difficult, elusive and contestable (Hager 2011) and learning is often invisible (Gherardi 2006), embedded as it is in the organising of the ED, 'that enacts subjects (individual, collective, organizational and institutional), objects and the relations among them around a practice' (Gherardi 2001, p. 132). However there are arrangements and activities (and even measures of learning) that are visible and identifiable. For example, in formal learning settings these may include classrooms or workshops where learners are doing tasks, teachers teaching, etc., and students achieving certain grades in a specified learning activity.

In workplaces (and in the ED), more formal arrangements might include weekly training and/or (reflexive) sessions, pairing arrangements for working together, in-service training, and in the ED, Grand Rounds, etc. (to discuss the week's cases and actions taken, etc.). More informal learning arrangements might include nurses and doctors participating in interest groups, seminars, visiting speaker sessions, etc. and as identified above, more invisible learning might occur through talk on practices, a major contributor to how practices are maintained and regulated (Gherardi 2006).

I organise the data and discussions in Chapter Five as outlined in Table 10 below, yet caution that the relationship between these arrangements and the kind of learning that takes place – its duration, comprehensiveness, etc. – are difficult to gauge and/or estimate.

The table therefore illustrates the complexity of conceptualising and understanding learning.

In Column 1, I identify three categories of learning arrangements: professional formation, informal learning arrangements and formal learning arrangements. Through the discussion I link these learning arrangements to the pedagogic processes identified in Column 2. Some pedagogic processes occur in all three categories of learning arrangements: for example, learning by doing. Column 3 identifies how learning is understood to occur identifying some (practice) theorists who have researched workplace learning and or organisational work.

Table 10 is an heuristic framework of learning rather than one that should be seen as reductionist or fixed (Hager 2011).

Arrangements for and outcomes of learning in the ED		Learning understood as...
Learning arrangements	Pedagogic processes…	
Doctors' and nurses' professional formation prior to (and when apprenticed in) the ED (5.2) Professional formation through formal study and through internships	Learning practice knowledges (through exposure to and discussion on) Learning by doing – apprenticeships/ internships (Bradley 2009) Learning through competency- and complexity-based frameworks (Colville 2011, 2013)	Disciplinary Formal Individually acquired (Sfard 1997) Collective (Hager & Johnsson 2012; Orlikowski 2002; Sfard 1997) Knowing-in-action (Gherardi 2009; Schön (1987) Doing and revising (Argyris & Schön 1974) *In vacuo* (Bleakley 2006)
Informal learning (arrangements): doctors' and nurses' learning practices *in situ*, work, task and role allocation (5.3) Work task and role allocation in the ED i.e. doing observations, inserting cannulas, taking histories, collecting forms (see Tables 11 & 12 below)	Learning through participation in practices (Gherardi 2006, 2008; Schatzki 2002; Strati 2003, 2007) (see Tables 11 & 12 below) Learning through institutional practices, objects, posters, documents, learning that is site-specific (Gherardi 2006, 2008, 2009; Schatzki 2005) Learning through peripheral participation (informally) Learning by doing	Participatory – peripheral (Lave & Wenger 1991; Talja 2010) Situated participation in a (social or organisational) setting (Gherardi 2006, 2008; Schatzki 2005) Disciplinary (Contu & Willmott 2003) Institutional (sociomaterial) (Fenwick 2009) Embodied (Strati 2003, 2007) Individual/systemic/incidental (Engestrom 2008) Collective (Hager & Johnsson 2012; Orlikowski 2002) Transitional in practice (Kilminster *et al.* 2010; Zukas & Kilminster 2012) Relational (Cook & Brown 1999; Gergen 2009; Johnsson 2009)
Formal learning arrangements in the ED (5.4) Paired working – learning by doing (for nurses) Learning by doing – apprenticeships ('working up' patients under supervision – for doctors) Grand Rounds (for doctors) In-service training/reflective sessions (for nurses and doctors)	Learning through (peripheral) participation in practices, i.e. being supervised, being mentored, paired working etc. Learning by doing (apprenticeship) Learning *in vacuo* through organised working arrangements, i.e. reflexive sessions, in-service training sessions	Collective (Hager & Johnsson 2012; Orlikowski 2002) Knowing-in-action (Gherardi 2009; Schön 1987) Disciplinary Participatory Proximal development (Vygotsky 1978) Reflexive (Iedema 2011b) Individual Collective (Hager & Johnsson 2012; Orlikowski 2002)
Learning as emergent and past, present and future-oriented (5.5)		

Table 10: Arrangements and features of learning

5.2. Doctors' and nurses' professional formation prior to (and when apprenticed) in the ED

Learning practice knowledges: a disciplinary perspective on learning medical practice

Doctors and nurses who join the ED have been formal education participants for a considerable time before they become ED workers. They come with knowledge, skills and identities, situated in the disciplines of medicine and nursing with little understanding of the work and roles of colleagues in other disciplines (Matthews *et al.* 2011). For doctors, pedagogic models are multifaceted. Firstly, according to Schön, doctors' professional formation falls within the 'scientist-practitioner' model, somewhere between the 'technical-rational' and the 'reflective practitioner' models (1987 in Bradley 2009, p. 67). In the scientist-practitioner model, 'professional competence consists in [sic] the application of theories and techniques derived from theories' (Bradley 2009, p. 67). This is a 'knowing-that', where good practice and professional expertise can largely be gained *in vacuo*, i.e. in isolation from a real context. In the technical-rational model, according to Dewey (1966), practice is viewed as professional artistry, 'a 'knowing-in-action' that is not about solving problems 'by the book' [rather] competence [is] best shown by successful dealings with novel situations' (in Bradley 2009, p. 67). According to Schön, 'in this alternative model, professional training is best undertaken *in situ*' (1987 in Bradley 2009, p. 67).

The technical-rational approach to professional training is based on scientific principles and evidence *in vacuo* and it is this kind of knowledge that junior doctors bring to EDs which then provides them with the training to develop their knowing-in-action. Medical colleges too acknowledge that the decontextualised knowledge of medicine, learnt *in vacuo*, must be practised in a real contextual setting. Therefore, practising on the patient in the bed is a key pedagogical approach to learning practices in medicine – that of trial and error doing and saying, involving reflecting and then revising actions, i.e. learning (Argyris & Schön 1974).

Secondly, the pedagogic model for junior doctors in the ED is part of the apprenticeship model, although medical training *per se* shifted away from what was 'an idiosyncratic apprenticeship model to a more rigorous, systematic, biomedical and educational approach' in the early part of last century (Flexner, 1910 in Lee *et al.* 2013). However, junior doctors still practise under the guidance of more experienced seniors in the ED. This is what Lave

and Wenger refer to as participating legitimately on the periphery of action (1991). Learning in situ *is* done through role modelling, doing, watching, listening and seeing. Each of these approaches recognises that *in situ* practice is key to medical socialisation and learning, thereby seeing learning not only occurring before and outside practice (Zukas & Kilminster 2012). However, learning theories in medical education in particular continue to focus on individuals and their commodified knowledge rather than on collective, or social theories of learning (Bleakley 2006) which might take a broader perspective on the panorama of learning available while doctors and nurses work. According to Swarnwick, there is a growing interest in developing the medical apprenticeship model with a greater emphasis on social practice (Swarnwick 2005).

More recently, doctors' training is being located in competency-based (CBT) curriculum frameworks such as that proposed by the CANMEDS (Canadian medical) model of training This approach is supplementing (not replacing) both the formal learning and the apprenticeship model of medical training (Maudsley *et al.* 2000). A competency-based approach to post-graduate medical professional development is becoming more popular globally as governments all over the world move towards more explicit pedagogy models and more explicit statements of what skillsets and dispositions are required in practice contexts (The Interprofessional Curriculum Renewal Consortium 2013).

However, Colville (2011, 2013) argues that converting the current apprenticeship-based medical training to a CBT model is problematic. Firstly this would involve a significant conceptual shift in pedagogic thinking and would fail to address limitations inherent in both kinds of training. According to Colville, CBT fails to come to grip with complex professional work, and could easily ignore the complexities of everyday medical practice training. On the other hand, apprenticeship-based training requires prolonged training, involves little professional diversity, and isolates itself from community concerns.

Colville (2011, 2013) therefore argues for complexity to be added to competency-based curricula. This third approach (which she calls complexity-based training) will provide a better answer to the problem of the future of medical training. Complexity-based training addresses the 'emergent, uncertain, non-linear nature of the problems to be solved for patients through medical practice' (2013, p. 2). This approach would allow multiple stakeholders to be involved in care, and would provide a way to talk about the

contradictions and dilemmas they face which neither the apprenticeship or competency-based curricula/forms of training addresses adequately.

Learning practice knowledges: a disciplinary perspective on learning nursing practice

For nurses, the pedagogical models are different and have been shifting for a considerable period of time. Nurses' earlier models of pedagogy were largely experientially-based, but more recently nursing in Australia has moved into the university sector where more scientifically-based subjects form the core of study. Alongside this change, nursing as a profession has been in the process of professionalising its practice for a couple of decades, based on models of professional practice spawned by ''the new managerialism' […] where professionalism consists less in expert practical judgment than on meeting general standards for effective practice' (Bradley 2009, p. 65).

Learning practice knowledges through apprenticeships (internships): a health department perspective on learning medical (and nursing) practice in the ED

From a health policy (and medical colleges) perspective, junior doctors in EDs are institutionally positioned as more expert in different and more highly valued areas of knowledge than their nursing counterparts. Yet when they arrive at the ED on a rotational basis, they lack the general *in situ* experience of senior staff nurses who monitor patients closely and who have been working in the ED for longer periods than they have. As learners, junior doctors join an established institutional team who are individually and collectively experienced, yet they remain the key decision makers as they 'work up' patients. They enact at a personal level as they work a medico-legal responsibility for care, even though the senior doctor on duty holds the overall responsibility on the day.

Because EDs are attached to tertiary training hospitals, the NSW Health Department (and medical colleges) adopts the view that EDs are a designated learning site for junior doctors in particular. EDs are seen as places where practising develops 'knowing in action'. What this means in practice is that in the ED junior doctors are 'thrown in at the deep end'. This *in situ* component of their training recognises that knowing how to practice is not just an object (of knowledge) captured by means of mental schemes, but that it is also a practical activity involving dealing with real problems in real-time. ED clinicians and ED training paradigms therefore recognise that knowing-in-action is best done *in situ*, yet *in situ* it is still

the *in vacuo* medical knowledge that is valued more highly than the practical knowledge and experience of more senior nurses as I illustrate below.

5.3. Informal learning arrangements: doctors' and nurses' learning practices *in situ*, work, task and role allocation

Learning through participation in practices (introduction)

I situate work, task and role allocation as informal learning arrangements for a reason. While task roles are taken-for-granted working arrangements, they embed disciplinary and institutional learning and as such prescribe who can participate, and who can do and say certain things: they prescribe doings, sayings and beings. 'Learning is enacted within the boundaries of a domain of knowing and doing: a practice' (Gherardi 2001, p 132). As nurses and doctors participate in practices in the ED learning occurs as they participate in these practices (Gherardi 2006, 2008; Schatzki 2002).

Tables 11 & 12 below illustrate that work, task and role allocations are disciplinary, emergent, situational and relational. The actions are sequential, but they are only selected ones: many other doings and sayings are not included in Tables 11 & 12. As such, they illustrate only some of the doings and sayings (and disciplinary tasks) of nurses and doctors in Jane Edna's and Joel's consultations. I purposefully include the detail in the tables as a component of the thesis text, as it is the detail (although pared down) that serves to emphasise the necessary (micro) sequencing of healthcare tasks that occurs in real time.

It is challenging to read the detail of the data in Tables 11 & 12. For this reason, I include symbols identifying recurring disciplinary activities/relational events to facilitate reading the tables. For example, a document symbol is used to illustrate where things are written down; medical tasks are identified by a circle to signify more technical undertakings, e.g. ECGs; a flash symbol to illustrate where there is conflict or tension between nurses, doctors and/or between them and patients; a lightning symbol to indicate patient distress; and finally, nursing tasks are identified by a hospital symbol to signify actions such as them doing 'observations', etc. In some examples I include commentary in the tables themselves, to explain how nurses, doctors and patients challenge each other's legitimacy (in doing, saying or being).

Legend for the symbols of disciplinary activities in Tables 11 & 12:

Legend	Symbol
This indicates writing or written documentation; notes; files; (mis)location of these, etc.	
This indicates medical evidence, e.g. X-rays; ECGs; blood tests – most utilised by D1, showing medical inquiry, investigation, etc.	
This indicates conflict or disagreement in the consultation, either between the nurses and doctors or between the patient and the nurse or the doctor.	
This indicates patient distress/experience/ commentary.	
This indicates tasks/visits that nurses do including observations (obs), checking in on Jane Edna and Joel, etc., involving maintenance of the consultation.	
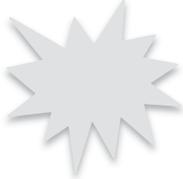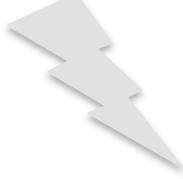
No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
1	10.00am	JE[20] arrives at ED		
2	10.00am	A1 (Ambulance officer) hands over to the triage nurse	*A1 Okay this is Edna ((surname)) [ninety* *P [Called Jane*	JE corrects her name
3		Patient is moved into 'resusc' room as there is no other space available		N1 writes up triage notes (D1 does not read these)
4	10.18am	D1 arrives in room (1st visit) and gets a handover from A1		D1 engages with A1; neither speak to N2 at this point
5	10.20am	D1 does history taking	*D1 Hello Jane* *P Hello* *D1 Hi I'm Louis I'm one of the doctors here* *P Yes* *D1 How are you doing?*	D1 conducts initial history taking plus examination
6		D1 asks N2	*D1 Are you doing the ECG?*	D1 'asks' N2 to do the ECG
7	10.35am	N2 does ECG	*N2 Is that alright? ((N2 asks D1 if the results are OK))*	N2 defers to D1's authority
8	10.38am	D1 books X-ray for JE and questions JE further		N2 writes 'obs'; D1 arranges medical investigation (X-ray)
9	10.41am	N2 takes blood ((and shortly afterwards asks D1 whether she should insert a cannula))	*N2 Sharp scratch ((nurse warns Jane Edna))* *N2 Do you want me to put a cannula in or not?* *D1 Ahh* *N2 No? No way?*	D1 rejects N2's suggestion to insert the cannula: medical authority is enacted. There is confusion over the expiry date of the spray. D1 wants the pathology forms; N2 leaves to get them
10	N2 suggests another GTN	JE is in pain again then D1 decides to put in a cannula, having earlier rejected N2's suggestion to do this	*N2 Louis do you wanna try another GTN?* *D1 Why?* *N2 She's saying she's got more pain now*	D1 rejects another of N2's suggestions: medical authority is enacted. They then discuss the dosage of the Anginine, information they've both forgotten from the handover. Dosage is in the handover notes. N2 reads the notes and provides 'legitimate' information to D1
11	10.54am	D1 checks allergies and inserts cannula	*D1 Okay Jane just a bit of a scratch that's it*	Has to coax JE to have the cannula inserted – medical authority is enacted
12		N2 returns for her 3rd visit	*Checks on JE's pain*	N2 goes to get some pain relief and N2 consults D1 on this: D1's medical

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[20] Key to participants: Jane Edna's junior doctor (D1) is Louis and her second doctor (D3) is Edwina. Her nurses are Nurse Bella (N2), Nurse Cate (N4), Nurse Jacqueline (N3) and Nurse Peter (N5), and her aged care nurse is Nurse Pamela (C1), A1 is the ambulance officer, Ra2 is the radiography nurse.

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
				authority is enacted
13	11.08am	D1 asks N2 to do another ECG and N2 questions this. To N2's question, D1 replies *Yeah*.	*N2 Yep why is that? See if it's slowed down a bit?*	D1 requests N2 to do another ECG but she seeks to learn from D1 about why: or maybe she questions the need for this
		Nurse 2 is left to explain the reason to Jane Edna	*N2 Jane I just have to do another heart tracing because you it seems like on the <u>monitor</u> your heart rate's come down a little bit so we'll just see if there are any <u>changes</u> since the last one*	N2 is left to explain to Jane Edna why she is having another ECG
14	11.25am	JE takes oxygen mask off	*((Jane Edna removes her oxygen mask))*	JE exercises agency
15	11.32am	Diagnostic feedback from D1 on his 3rd visit	*D1 Okay Jane chest X-ray looks good there's no signs of pneumonia okay and I couldn't see any evidence that you're um that you have congestion as well okay*	
16	11.34am	N2 tells her they will move beds	*N2 No no no that's fine I'm just I'm just saying you'll be staying in this bed <u>now</u> while you wait for the blood test but I'm just going to take you around to another area*	JE is moved again and N2 has to explain why: institutional needs are enacted
17	11.42am	N3 (experienced) and N4 EEN come to see her for their 1st visit as they do their rounds	*N4 Hello there I see a familiar face*	N4 is corrected by N3 as N4 thinks JE needs to have an ECG but it is only cardiac monitoring. Senior nurse to junior nurse – legitimate knowing
18	11.58am	N4 returns for her 2nd visit to check pulse	*N4 Right*	N4 asks doctor re meds away form the bedside
19	12.00pm	N4 returns for her 3rd visit to give medication and do observations	*N4 Okay, so Edna I've asked the… I've told the doctor about this pain you're having and he wants me to give you a medication in case the pain you're getting is from the acids in your tummy so*	Gives her medication on advice from D1: medial authority is enacted
20	12.11pm	D1 returns for his 5th visit	*D1 Hello Edna ((chirpy)) how are you doing?*	N2 asks another nurse to check the morphine dosage she is giving: legitimate nurse to nurse knowing
21	12.52pm	D1 returns for his 6th to tell JE they are going to scan her lungs for a clot. He also asks new questions	*D1 Okay [Edna?* *P [Yes* *D1 Now um we're gonna <u>scan</u> your lungs*	
22	12.57pm	D1 returns for his 7th visit and informs Jane Edna they're going to	*D1 Hi Jane just wait for the …* *P Pardon?* *D1 We'll just wait for the – um –*	

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
		scan her lungs	*radiographer to take you to the to the scan okay?*	
23	12.59pm	N3 arrives for her 2nd visit	*N3 I'm just checking that everything's up to date*	D1 has said she can't eat yet N3 offers JE a sandwich – does not read notes. Researcher intervenes and lets N3 know JE can't eat.
24	13.23pm	C1 (aged care nurse) arrives for her 1st visit	*C1 Hello Mrs ((surname))*	
25	13.40pm	Four nurses standing around near bed joking as they have a handover	*N? She was in 'resusc' for a little while*	Legitimate nurse-to-nurse knowing. One nurse asks N1 why Jane Edna was in 'resusc'
26	13.50pm			C1 tells N4 JE has to go up for her scan: legitimate nurse to nurse knowing
27	13.53pm	N5 arrives for his 1st visit N5 takes her pulse and checks oxygen levels	*N5 I'm just having um just I'm just going to okay my name's Peter I'm one of the nurses that's on for this afternoon okay I just want to know if you have any pain anywhere at the moment that I*	Change of shift has taken place. N5 has had a handover form the nurses: legitimate nurse to nurse knowing
28	13.56pm	N5 does another 'obs' until 13.56pm, leaves at 13.59pm	*N5 And you know that you're being booked in to have a um an X-ray – a CT – or it's similar to an X-ray*	Does observations and notes these down
29	14.05pm	N5 returns for his 2nd visit. JE asks to go to the toilet. N5 says he'll come back and assist her.	*N5 As you know Edna the doctor wants doesn't want to let you have anything to eat or drink just right at this moment until you've had the scan okay*	N5 has sought advice from D1: medical authority is enacted. Counting meds – two nurses attend to do this: legitimate nurse to nurse knowing
30	14.07pm	N5 returns for his 3rd visit attaches the oxygen saturation probe but patient doesn't want her finger attached	*N5 Edna just need to check this for you* *N5 Before we go to the toilet I need to just need to have this back on your finger for a moment or two*	Checks numbers on the screen
31		C1 returns for her 3rd visit	*C1 Sorry I've just rang the X-ray department*	C1 has checked on the timing of the scan: resources her knowing from the X-ray department
32	14.41pm	N4 comes back from lunch for her 6th visit and says she'll call about the scan	*N4 Oh I'm back again I've had my lunch*	N4 had gone to lunch: N4 also rings X-ray department
33	14.44pm	N4 returns for her 7th visit. JE asks N4 if she can have a sandwich	*N4 Okay so is it on? Okay so I called down to the Department to see when it's being done*	N4 has rung the radiography dept. N4 consults D1 about JE having a sandwich: medical authority is enacted
34	14.45pm	Patient talking to researcher	*P I have a feeling they've just left me lying here*	
35	14.52pm	N4 returns for her 8th	*N4 Just talked to the doctor he's*	N4 seeks advice from the

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
		visit	*having his lunch at the moment when he's finished he'll come out but he wants you to keep <u>fasting</u> for now and he wants a drip with fluids to go through to keep you hydrated*	D1 again who doesn't give in to the sandwich request after JE asks for food: medical authority is enacted
36	14.55pm	N4 arrives with a sandwich for her 9th visit	N4 *I've got here it says 'hands off' this is yours so the ambos don't eat it*	
37	15.00pm	D1 returns for his 8th visit	D1 *Hello how are you doing?*	Tells JE there is a delay at the X-ray
38	15.32pm	JE refused the drip and gets a sandwich	P *It's the waiting that gets you down.*	JE exercises her authority in getting the sandwich – which ultimately is central to her diagnosis
39	15.43pm		P *What do they do with all their records?*	JE doesn't understand where the knowledge about her is stored
40	15.57pm	O1 arrives back at the bedside with the wheelchair for his 2nd visit to take JE for her scan	O1 *I think they're all out to tea somewhere*	Radiographers are not in the radiology department when JE arrives
41		Ra2 at radiography	Ra2 *Anything you're not sure about you make sure you ask, okay?*	Ra2 encourages JE to seek assistance
42		O2 – new orderly – arrives for his 1st visit, doesn't know who's looking after her	O2 *I don't know who's looking after her you're not looking after her? ((asks the researcher))*	
43	17.10pm	D1 returns for his 9th visit and says he'll look at the scan results and come back	D1 *Alright sweetie how are you?*	Scan results only arrive at 19.00pm
44	17.19pm		P *Oh boy I just want to go home*	JE is left alone after returning from radiography from 5.09pm to 5.15pm
45		C1 returns for her 4th visit	C1 *Did you have anything to eat yet?*	C1 goes to collect bedpan for JE: does not know what has happened in the interim to JE
46	17.47pm	C1 returns for her 6th visit and tells her the urine sample is good	C1 *Thing was fine so that was good*	
47	17.50pm	C1 brings her some food (7th visit)	C1 *I was able to find some food for you*	
48	17.56pm	C1 checks on her again for her 8th visit. Notes didn't return with her from X-ray	C1 *Enjoying your sandwich?*	Notes are misplaced
49	18.01pm	JE suddenly stops talking	P *I thought I was doing so well*	Researcher calls a passing nurse (N6)
50	18.04pm	N6 1st visit, responds to the researcher calling her because JE is feeling unwell	N6 *Oh what's the problem?*	N6 does not know anything about JE
51	18.06pm	D1 arrives for his 10th	D1 *Where's the pain?*	N6 suggests to D1, C1 and

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
		visit: N6 suggests that the condition is epigastrium: D1 asks for another ECG	N6 *So that's the epigastrium there well it's more epigastrium*	N5 that it is epigastrium. D1 only says 'yeah': nurse's suggestion not seen as legitimate knowledge by D1
52	18.07pm	N5 sets her up to do another ECG (during his 4th visit)	N5 *Edna we're just going to do an ECG as well have you had one of these before?*	JE has already had two ECGs: N5 has no cumulative knowledge
53	18.12pm	D1 asks N5	D1 *How do you do this*	Only request for help by D1 from the nurses
54		D1 gives feedback to JE after the ECG results	D1 *Okay Jane it's still the same okay I think it's more of your stomach rather than your heart*	D1 uses ECG results to confirm his medical authority
55	18.16pm	Presses bell, still waiting at 18.20pm. C1 arrives for her 9th visit. JE asks her about the thyroxin. C1 says she'll ask the doctor	C1 *How are you getting on?* P *I'm wondering if this condition could be too much thyroxin in the thyroid gland?* C1 *Well they would have done the blood tests [* P *[Well ask them [* C1 *[So I'll ask Doctor [* P *[Because when I had the last attack my own GP told me it was too much thyroxin in the thyroid gland* C1 *Mm* P *That only just came to me* C1 *I think they would have done all the tests and it would have showed up on the computer* P *Well at least would you do me the favour of asking them?* C1 *I will I will I'll go and [* P *[Thank you [* C1 *[Ask*	C1 initially does not want to accept the possibility of thyroxin in the blood: nursing knowledge is enacted C1 then advises D1 of Jane's request to check the thyroxin:

Nurse Pamela (C1) is reluctant initially to pursue the inquiry, suggesting that if this *were* the case, the excess of thyroxin would have shown up in the tests: *Well they would have done the blood tests*. Nurse Pamela places her trust in the (medical) institutional knowledge provided by Jane Edna's blood test, rather than in Jane Edna's knowledge of her own condition. At this point Nurse Pamela is not in fact sure whether Jane Edna's level of thyroxin would have been tested; if she were, she would have indicated this to Jane Edna. Instead she hedges her certainty: *I think they would have done all the tests*

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
56	18.22pm	N7 arrives for her 1st visit responding to the bell and JE asks N7 the same question about her thyroxin	N7 *Hello. How are you?*	JE still seeking to manage her own care
57		C1 returns for her 10th visit and answers the question. JE starts to tell C1 all her other symptoms	C1 *I've just asked the doctor and he's going to add it on to your blood test and you won't know that today, the result of that because he'll add it on and he'll send it to your GP*	Another test is added to her blood analysis: patient authority is enacted
58	18.24pm	D1 arrives for his 11th visit to talk to JE again	P *Is that you doctor that came to me this today?*	C1 and D1 discuss her symptoms: JE does not

No.	Time	Selected visits and disciplinary doings		Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
		with C1			recognise D1
59	18.36pm	Talking to the researcher	*P*	*When I think of all the tests…*	
60	18.55pm	JE saying she doesn't want to stay the night	*P*	*I don't want to stay the night if possible*	JE seeks to exercise her independence
61	19.00pm	Still waiting on CT scan results			Scan results arrive. Shift handover takes place.
62	19.02pm	D3 (1st visit) gives diagnosis	*D3*	*Mrs ((says surname))?*	D3 has had handover from D1: legitimate doctor to doctor knowing
			P	*That's right*	
			D3	*I'm Edwina I'm the evening doctor and you're the…?*	
63	21.15pm	JE goes home			Discharged, returned by ambulance to hostel

Table 11: Learning: enacting disciplinary tasks (and authority) in Jane Edna's consultation

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Below is the detail of actions for Joel's consultation.

No.	Time	Selected visits and disciplinary doings		Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
1	11.29am	J [21] arrives at ED			
2	11.29am	N1, 1st visit, triage nurse asks first question	*N1*	*Pop this one under your arm… ((later)) so at the moment um you're not on any active chemo or radiotherapy or anything like that?*	N1 writes up triage notes
3	11.30am	Z1 (Ambulance officer)	*Z1*	*Paul ((preferred name of patient)) yes*	Z1 calls him Paul now but then says 'see you John' a short while later
4		J is moved to his room			
5	11.33am	N1 (2nd visit) returns to ask one more thing	*N1*	*Can I just ask you one more question?*	Checks on J's pain levels. J tells her he only feels pain if he moves.
6	*11.35am*	*N2 arrives for her 1st visit to do 'pat' slide*	*P*	*Are you a leg holder?*	N2 called to assist with pat slide. N2 overrides ambo's suggestions and hurts J: nursing authority is enacted over ambulance officer's knowledge
			Z2	*Yeah, just to make sort of [general …*	
			N2	*[Ah that's just one of my specialties*	
			Z2	*Doing the (..) very painful um ((N2 moves Joel's leg and he yells out in pain))*	
			Z1	*Yeah*	
			Z2	*Very painful [yeah so (..)*	
			N2	*[(Sorry darling) um*	
			Z2	*We'll make sure that it goes*	

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[21] Key to participants: Joel's junior doctor (D1) is Doctor Surita, Z1 is ambulance officer, Z3 is a nurse educator, Joel's primary nurses are Nurse Janita (N2), Nurse Nelly (N3), and Nurse Leah (N6), Nurse Wanda (N4) is the in-charge for the shift.

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
			with you	
			P *No don't you move that leg*	
			N2 *What are we – what are we looking after you fallen (over) or what? ((N2 makes an assumption of what has happened to Joel))*	
			Z2 *No no he's got CA of the bone*	
			N2 *Oh okay*	
			Z2 *And he's had a rod put in it's quite painful ((this is the first time the rod is mentioned; it wasn't mentioned at triage))*	
			P *You're about to grab that [and just jerk it*	
			N2 *[I'm – I'm – I*	
			P *[And I'm going to scream if you [do*	
			Z2 *[No we*	
			N2 *[I want you to pop your arms across your <u>chest</u> for me please I want you to take a nice big deep breath tuck your chin into your chest and on the count of [your count ((nurse takes charge over ambos))*	
			Z2 *[Three*	
			N2 *We're [gonna move over*	
			Z2 *[(..) pillow too mate*	
			Z1 *Yeah*	
			N2 *Ready?*	
			Z1 *On three one two three ((they move Joel))*	
			Z1 *[How was that?*	
			N2 *[How's that?*	
			Z2 *That's it ((name of patient – not preferred name)), done*	
			N2 *Wasn't <u>too</u> bad?*	

In this example Nurse Janita's (N2) assumptions and taking control of the care just prior to Joel yelling out, illustrate the hierarchical and spatial control she exerts over the ambulance officers, as she enacts her authority over them. She moves Joel without listening to them or without talking to Joel prior to moving him. She then makes an assumption about what has happened to him (which she gets wrong); Z1 and Z2 only have the opportunity to explain to her what his condition is once he has been hurt. During the move, she takes control of Joel and the situation – she lapses into a protocol or rule-governed doing of how she and the ambulance officers will subsequently move Joel off the pat slide onto the bed. *I want you to pop your arms across your chest for me please. I want you to take a nice big deep breath, tuck your chin into your chest, and on the count of – your count.* Z1 completes her sentence with *three* and they move Joel although Z1 quickly reminds them that one of the objects – *the pillow too mate* – must come with them.

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
7	10.39am	N3 arrives for her 1st visit with EEN (N4).	N3 *Hello. (..) So what we'll do first I'll be the nurse looking after you is um we'll get you into a hospital gown okay and do all our basic observations*	They do 'obs' and an ECG (entered by EEN): legitimate nurse to nurse knowing
8		Z3 arrives to give an in-service to the nurses on		Legitimate nurse to nurse knowing: in-service

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
		a new injector machine		
9	11.49am	D1 arrives for his 1st visit.	D1 *Cancer or something? ((D1 in aside to N3))* N3 *Yeah his wife's gonna give you the whole history*	D1 asks N3 prior to talking to Joel. N3 hedges giving D1 any detail

In the example above, before he sees Joel at the beginning of the consultation Doctor Surita *(D1) seeks information from Nurse Nelly (N3)*. Nurse Nelly (N3) is uncooperatively selective about what she chooses to tell Doctor Surita (D1), but she hedges overt professional rivalry by letting Doctor Surita (D1) know, that even though *she* is not telling him much, he will shortly be able to source the information he is seeking about Joel, *from Jill.*

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
10		D1 gets this information wrong	D1 *Hello* P *G'day* D1 *I'm <u>Surita</u> here one of the doctors ((later he greets J with)) Hi you seem to be in excruciating pain today?*	D1 spends first minutes getting history from Jill, Joel's wife. Asks about medications and metastases. D1 and wife discuss medications again.
11		D1 asks J and Jill, J's wife responds 'No'	D1 *Have you got any fever in the last couple of days?* F *No*	D1 asks this again later and there is a different answer
12		Examines J and then D1 comments	D1 *I have closed the time when you said <u>here</u> ((D1 refers to the point that Joel indicated he felt pain in the previous examination))* P <u>*Yeah*</u> *((Joel indicates surprise)) <u>now</u> there [yeah it's – it's about there* D1 *[Here <u>where</u> – <u>where</u> is the pain on your <u>groin</u>?*	D1 queries Joel's initial responses
13		N3	N3 *That's alright I might just leave it now and let you get started*	Nurse stops what she's doing and leaves: does not share the same space with D1
14		D2 speaks to D1 about who is meant to be looking after him	D2 *Did you pick him up did you?*	D2 comes to the door and asks D1 if he's logged on to the patient: intra-professional rivalry
15	12.20pm	Patient asks researcher to get him some water. N4, 1st visit	N4 *Yeah and he's had a <u>rod</u> put in...?* P *I just asked the lady for a glass of water.* N4 *That's right, but I've got to make sure, I want to know – actually I don't know you ... ((although N4 is the in-charge nurse, she knows nothing about Joel))*	Researcher calls N4 to see if Joel can have water N4 (in-charge) brings Joel water after checking that he can have it but tells him that she doesn't 'know' him
16	12.25pm	D1 returns for his 2nd visit	D1 *You have you don't have any (X-rays or) anything from the hospital eh*	D1 asks Joel's wife about the X-rays, medication and diagnosis of cancer again
17	12.45pm	N3 returns for her 4th visit	N3 *Hello, I'm back just going to do your blood pressure again how's your pain at the moment?*	

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
			N3 ((a little later)) Um I see your Doctor's got your notes	D1 has taken notes away: N3 the 'obs' on a piece of paper
18	12.52pm	N3 returns for 5th visit to report blood pressure results		
	12.57pm		P Well you – you just – it's frustrating that you come in here and you – you ah – you report what conditions that you're in and people must think you're a bloody goose because and I've been here I don't know probably an hour or so and it's the same no pain whatsoever other than when they put me into the bed	Joel expresses his frustration because he is repeatedly questioned about his pain, which he only feels when he moves.
19	12.58pm			Doctor logs himself onto Joel at 12.58 pm
20	13.12pm	D1 arrives for his 3rd visit to just check something	D1 I need to ask you one thing after you went to All Saints Hospital to do the X-ray…?	
21	13.25	D1 returns for 4th visit. Checks the medication dosages and decides to take blood	D1 I'm yet to receive the papers from…	Old papers are still in another place. D1 leaves with the wife's medication book
22	13.35 pm	Handover from N3 (7th visit) to N6 (1st visit)	N3 Um yeah so and he's fine if he just lays there and doesn't move but if he moves he gets in pain	Shift changes and N6 checks need for painkillers again
23	13.36pm	D1 pops in for 5th visit	D1 Who's your radio- who's your radiotherapy- or who's your doctor?	D1 working in the background on notes and previous clinical history
24	13.37pm	N6 offers to call palliative care	N6 Okay can you give me a sticker and I'll try and contact him	N6 does disciplinary work
25	13.40pm	N6 back for her 3rd visit and D1 (6th visit) taking blood	D1 Can you make a strong fist? No – no squeeze it	N6 starts to do admission
26	13.45pm	D1 leaves to collect the lid		D1 also speaks to people at previous hospital where Joel has been
27		N6 does list of medications		
28	13.47pm	D1 returns (7th visit). D1 doesn't speak immediately. N6 asks D1 if she can get some PRN.	N6 Can I get some PRN?	N6 asks D1, who does not reply (medical authority is enacted). Jill has just told N6 that Joel has Oxynorm PRN. Old notes have not yet arrived.
		D1 checks medications again and this time he write them down	D1 (..) so Oxynorm he doesn't get regularly it's only as and when (..)?	Medications already documented by N6
29	13.47pm	Handover in-charge to in-charge		Legitimate nurse-to-nurse knowing. This happens in the background
30		N6 to D1	N6 Are you taking notes?	N6 checks on D1 that he

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
31	13.52pm			is writing down history: challenges his authority Nurse leaves to collect phone to call palliative care team
32		N6 starts 5th visit and continues admission	N6 *Okay doctor's having a chat so on with the admission and there's a blank page here…* *((a while later)) exactly and we can get an X-ray and a CT and talk to …*	N6 tells wife Joel can have an X-ray: N6 takes a lead role in telling Jill what can happen; N6 pre-empts care options
33	14.07pm	D1 returns 8th visit, says nothing for a while then starts taking notes	D1 *Now you have a diary, you were maintaining a diary?*	D1 seeks specific information from Jill
34		D1 writing notes. D1 talks to himself as he writes 'Left' and then asks Joel's wife, Jill, a question	D1 *Left ((talking aloud as he writes, then addresses Jill)) so did they say that the bone mets was on the femur that is the thighbone*	D1 explains 'femur' to Jill: displays his medical authority
35		D1 is talking to Jill, Joel's wife not N6	D1 *No fever right? [((D1 is addressing Jill, Joel's wife))* N6 *[Alright do you want to get that Oxynorm now? ((N6 interrupts D1 and asks Jill the question, not D1))* F *Yes* D1 *There's no history of any fever? ((D1 repeats his question to Jill))* F *Um [in the past?* P *[No* F *[No not …* D1 *[No no last couple of days? ((D1 explains he's not talking about the past but wants to know if there's been a fever recently))* F *No no* P *No no* F *No* N6 *There's a low-grade fever at the moment 37.2 ((thirty-seven two))* F *And I wouldn't be surprised because he looked – had redness in his face this…*	D1 has asked this before in his 1st visit (see below)

In the example below as Doctor Surita (D1) arrives for his eighth visit to Joel's bedside at 14.07 pm, D1 and Jill (F) (Joel's wife) once again miscommunicate with each other. However, Jill is keen to demonstrate her medical knowledge as she shows how she recognises symptoms and what they mean. Doctor Surita (D1) begins by asking: *No fever right?* He has asked this before in his first visit. Neither Jill nor Joel, nor Nurse Leah (N6) responds to his question. Nurse Leah (N6) in fact cuts across him and asks Jill (she does not ask Doctor Surita (D1)): *Alright, do you want to get that Oxynorm now?* Jill responds: *Yes.* Doctor Surita (D1) then repeats his question: *There's no history of any fever?* Jill confuses what he means by the word 'history' and asks: *Um, in the past?* Joel then enters the conversation and answers Doctor Surita (D1)'s question originally intended for Jill: *No.* Jill then responds with: *No, not…* Doctor Surita, (D1) then clarifies that he means 'recent' when using the

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority

word 'history': *No no last couple of days.* Jill says: *No no...* Joel adds his confirmation: *No, no.* Jill agrees: *No.* Nurse Leah (N6) corrects everyone present with: *There's a low-grade fever at the moment, 37.2...* Jill seeking to establish some credibility as a medical knower adds: *And I wouldn't be surprised because he looked – had redness in his face this…*

No.	Time	Selected visits and disciplinary doings	Selected disciplinary sayings/doings	Enacting (disciplinary doings and beings) authority
36	14.07pm	N6 tells D1 she has the history all written down already	F *Oh hang on it was I've got it all in this page*	N6 gets lunch
37	14.08pm	D1 retakes all the details in writing because the fax from the hospital has not come through		D1 realises he does not have all the information about Joel that he requires. N6 has already written all the details down: D1 does not seek information from N6: D1 is selective about how he resources his knowing
38	14.15pm	D1 does minor examination		
39	14.18pm	N6 leaves again. D1 writing		
40	14.19pm	Male nurse arrives to assist with the Schedule 8 drugs	N? *Do you want me to come back Leah?*	Legitimate nurse to nurse knowing: D1 working in the background on the history and medication details
41	14.29pm	N6 leaves	N6 *Yeah we'll just get you sorted out and see what they've – what the grand plan is*	N6 refers to D1 as the authority: medical authority is enacted
42	14.30pm	N6 and in-charge have a discussion		Legitimate nurse to nurse knowing
43	14.35pm	Treatment not yet commenced		N6 faxes drugs to pharmacy
44	14.42pm	D1 pops back for files and his 10th visit	D1 *I'll just take this file where are his files?*	Files have been moved
45		N6 peeps through curtain for her 12th visit		
46	14.44pm	X-ray orderly (orderly) arrives	Z4 *How are you going? We'll just take you for an X-ray*	Joel is having lunch
47	14.45pm	D1 returns for his 11th visit	D1 *A little prick once again one blood result is a bit high so I just need to do a counter check is that okay with you?*	New evidence is required
48	16.00pm	D1 tells patient he is being admitted under Dr (..) ((oncologist))		
49	18.31pm			Joel is moved to the ward

Table 12: Learning: enacting disciplinary tasks (and authority) in Joel's consultation

Learning through participation in practices (discussion)

From Tables 11 & 12 above, nurses and doctors enact disciplinary ways of doing, saying and being. The way care is organised ensures that nurses' tasks include monitoring the care

of the patients and treating them (undertaking observations, taking temperatures, taking blood pressure, giving (some) medications), administrating (doing the admission, writing down medications, establishing patient details and symptoms), and supporting (offering to call palliative care, helping with the 'pat' slide, asking if cannula needs to be inserted). Doctors' tasks are treatment-related (ordering X-rays, taking bloods, organising scans, doing history taking, etc.). Jane Edna and Joel learn patient practices: Joel gives his history as does Jane Edna; Joel also expresses his frustration over the repeated questioning about his pain and Jane Edna is exasperated by the multiple questions and the absence of her medical records from the week before.

The sequence of everyday activities and actions illustrates that the way events unfold is dynamic, emergent and localised. The examples trace how doctors' and nurses' on-going on-the-job education in the ED involves learning how to do, how to be and talk as doctors or nurses generally – learning which is largely invisible and not necessarily addressed by the notion of 'preparedness' (Zukas & Kilminster 2012, p. 211) arising from formal pedagogies. More specifically, once in the ED, where work is very specialised, exacting and situated, nurses and doctors learn to know in practice – i.e. they develop a repertoire of doings, sayings and beings appropriate to the ED setting, by participating in practices.

The ED also produces learning opportunities as nurses' and doctors' actions respond to the spatio-temporal arrangements. Joel's triage nurse needs to return to ask another question (example 5) – as N1 writes up the triage notes, she (re-enacts her activity) remakes her practice (Price *et al.* 2012) (which involves learning) and returns to check on other things. N1 must resolve this socially, socio-materially and spatio-temporally. She understands the protocols and rules of work. So she returns to Joel's bedspace, asks the additional question and must ensure that this information gets into his file. Doctor Surita (D1) also looks for Joel's files (example 44). He crosses space and time and engages personally with Nurse Leah (N6) to locate Joel's files. Through his actions and affect, he demands to know where they are, collects objects (the file), works with them, as 'a space-time manifold of actions, organized by an evolving set of such items' (Schatzki 2006, p. 1864) which he enacts bodily. His actions embrace his knowledge, his emotions, his motivations, '(end-project-actions)' (Schatzki 2006, pp. 1864-5) – the need to care for Joel and record and manage his care – and adhere to rules or disregard them (at his own risk). These are all opportunities for learning (how to better manage files in the future, how to

navigate the space of the ED) unique to the ED setting and different from, say, a GP consultation.

Everyday work processes and tasks also provide other pedagogical functions. For example, handovers have been recognised as serving as a training procedure for nurses and doctors; they give information implicitly about the competence of staff and hospital services and they provide emotional support in the high-stress working context of the ED (Cohen & Hilligoss 2010).

Learning 'to be' can be understood by examining how nurses and doctors relate to their patients. For example, Nurses Bella, Cate, Leah and Noreen (and the doctors) are all motivated to care for, and cure, Jane Edna and Joel as nurses and doctors. In this, their practices are teleoaffective, i.e. nurses and doctors have goals and emotions invested in their doings, sayings and beings. This attachment to what nurses do is clear in another example (not included in Tables 11 & 12), when Nurse Leah (N6) explains her actions to patient Joel. What she does is closely connected to the objects she uses (her instruments) and her role as a carer. In this case she is reaching for the blood pressure machine when Joel questions what she's doing:

P   *What do you want there?*

N6   *I just want to make sure you've got pulses make sure your blood supply is good*

P   *Yeah the girls used to do that in All Saints Hospital*

F   *St Williams ((wife corrects Patient Joel))*

P   *St Williams*

N6   *It's what we do. Have to make sure your peripheral circulation's good.*

It's what we do is a powerful affirmation of the motivation and justification of the activities and actions of Nurse Leah (N6) as she cares for Joel. Her disciplinary solidarity, for example, is also conveyed through the poster on the wall above Joel's bed:
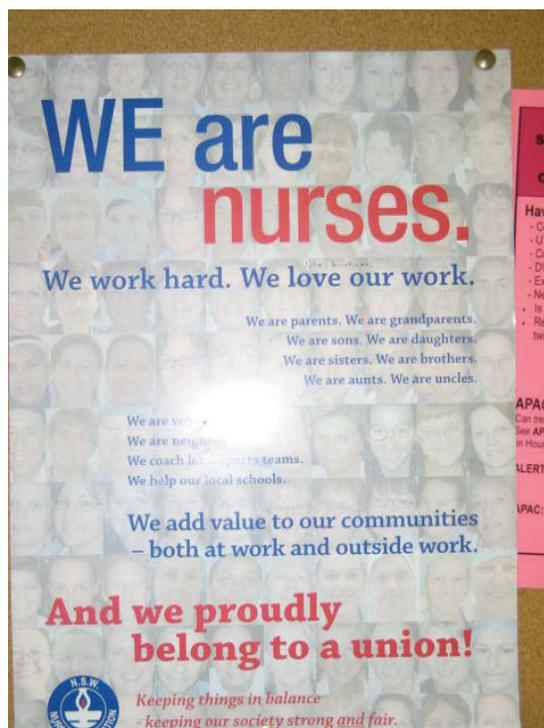
Picture 1: Nursing union poster outlining allegiances, identity, values and 'work'

The poster establishes group solidarity between Nurses Bella, Cate and Noreen, identifying them as different from Doctor Louis (D1) and the other doctors: the medical staff members are not mentioned in the poster. The poster conveys a sense of separation and exclusion from the medical staff, but the poster also invokes values of nursing that are components of their practices, i.e. their hard work, their membership of communities, of unions, and of families, ways of being. As well as being closely observed by Nurse Noreen (N3) as she works, Nurse Cate (N4) learns by doing minor tasks but she also learns from other modes of instruction about her professional allegiances and identity in the ED, such as the poster.

Gherardi outlines how

> [c]raft trades require trained bodies – ones, that is, which have incorporated an
> expertise. It is through the body that 'an eye' (or 'an ear' or 'a nose') for something
> is acquired, so that aesthetic knowledge (Strati 2003) also comprises the ability to
> develop a professional 'vision' in the broad sense (Strati 2003 in Gherardi 2008, p.
> 521).

Each nurse or doctor learns to incorporate an expertise, a so-called a 'trained body' (Gherardi 2008, p. 521). Learning is done both liminally and sub-liminally, through touch,

gaze, embodied and knowing practice, and through sayings, i.e. questions, reassurances and language accompanying (and explaining) action: *Hello, I'm back. Just going to do your blood pressure again. How's your pain at the moment?* Nurse Bella (N2) knows this is how close she can come to Jane Edna without causing alarm; Doctor Surita (D1) knows where he can touch Joel as he examines his leg; this is how he can stand and move his body around the bed; and this is how Nurse Pamela (C1) can act and be, i.e. friendly, casual, while caring, looking after, treating, questioning, prodding, and checking (also seeing) Jane Edna. Doctor Louis (D1), Nurse Noreen (N3), Doctor Surita (D1) and Nurse Nelly (N3) also know with their bodies when they use their instruments – the thermometers, the blood pressure cuffs, the X-ray machines, cannulas, the 'obs' machines, the stethoscopes, etc. (Hindmarsh & Pilnick 2002, 2007). Nurse Bella's (N2), Nurse Cate's (N4), Nurse Noreen's (N3) and Doctor Louis' (D1) and Doctor Surita's (D1)

> routinized behaviours consist of several elements, interconnected to one another: through forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (Reckwitz 2002, p. 249).

Nurse Cate (N4) learns to put away the 'obs' machine and rearrange the pillows for Jane Edna and working with the equipment draws on her embodied knowing. On seeing the ECG machine she is reminded that she might need to do an ECG, even though she gets this wrong (example 17). The 'objects, tools, and artifacts [also] embody knowledge; they anchor practices in their materiality; they interrogate humans and are extensions of their memory' (Gherardi 2009, p. 354). These objects 'therefore take the form of agency and enable organizing to be conceived as taking place within [the ED's] system of fragmented knowledge' (see Bruni, Gherardi & Parolin 2007 in Gherardi 2009, p. 354).

Knowing is therefore embodied, and as they work, nurses and doctors learn to embody their nursing and doctoring knowledge (Strati 2007). Mol describes how

> [l]ong before machines are put to use, clinicians diagnose with their senses. They notice posture, muscle tone and bruises; they hear sadness in a tone of voice or the signs of impaired breathing; they feel for the pulse, for lumps; and they may smell metabolic disturbances (2008, p. 39).

This kind of initial sensory perception contradicts the model of Bayesian logic and procedures in which doctors are trained, even though doctors themselves recognise that

clinical judgment involves 'subjective, context dependent reasoning' (Chitty 2005, p. 1390), yet this is an essential part of practising.

As Jane Edna's and Joel's care progresses, Nurses Bella, Cate, Noreen, Sandy and Leah respond bodily – through movement and affect – with specific interactions, in language and through actions at the bedside.

The relationship between knowing and working as physical embodiment and the ways they are intimately connected is observable when this connectivity breaks down, for example, when part-time doctors or nurses work or when a nurse or a doctor is new to the ED and they have difficulty finding their way around (see, for example, Finn & Waring 2006). Often they rely on earlier knowledges and experiences (Zukas & Kilminster 2012), i.e. prior knowledge is used for knowing how to manage unfamiliar situations. Learning for newcomers needs to be undertaken rapidly, especially when they face additional difficulties in locating equipment and completing documentation – an essential part of working and knowing. Occasionally part-time doctors and nurses cannot access the EDIS (electronic patient information system) either because they do not yet have login passwords, or are not allowed to access the system. In acute care contexts delays in finding forms and/or accessing data systems can have safety consequences for patients as novice or visiting clinicians struggle to manage the physical embodiments of where and how they can move at the nurses' station, or where and how to locate what they need. In these cases, there are practical constraints (praxis) that override what they know they need to do, i.e. knowledge as theory.

Not only do Nurses Bella, Wanda, and Doctor Louis and Doctor Surita (D1) work with their bodies, they also know through them and enact their knowledge and positions in various ways; they are 'differently skilled, differently sexed, and differently sexually oriented' (Gherardi 2009, p. 354) and in the ED they are also differently attired. Nurse Wanda wears blue, Doctor Louis and Doctor Surita wear striped shirts, Nurse Cate (N4), who is new, wears a light blue tunic, others wear a shirt and pants, and the senior doctors, although in the same roles as each other, wear different outfits and Frank, the physiotherapist, wears white as do all the other physiotherapists in the ED.

Picture 2:   Nurse Wanda stands at the computer with Doctor Louis, 'identified' differently through their attire and colours

Only the insiders (i.e. the regular staff) in the ED know what these clothing differences signal, the uniforms, stethoscopes and colours that differentiate nurses from doctors, from team leaders, from physiotherapists. Jane Edna does not recognise the roles of Nurses Pamela, Peter or Cate as they approach her bedside through their dress, but their colleagues do.

Learning through institutional practices, objects, posters, documents etc.

The scale of institutional systematisation through documentation alone in EDs is a reminder of how the institution organises practices.

Pictures 3, 4 & 5: Readily accessible documentation cupboards with relevant forms for staff to complete in three different EDs

Shelves are replete with information management documentation including ambulance trip forms, radiology request forms, medicinal labels, blood test request forms, procedural notes, template instructions, template referrals to GPs and community services and patient consent forms among others.

On the walls around the ED is additional documentation including other signage, guidelines, protocols, pharmaceutical information sheets, toxicology reports, medical research updates, diagrammatic flow charts, staff notices and so on, which nurses and doctors might need to consult. If these cannot help, there is always the Intranet where junior doctors can find the latest medical information. One junior doctor in another consultation seeks help there with a patient who presents with an anal fissure:

> I've just been reading up a little bit about anal fissure for my own edification, and really they say that often the diagnosis is pretty much made on history but I'd like to have a look and see if I can work out where it is… and then I've just been having a little look to see what sort of best practice recommendations are for treatment of that. (Junior Doctor in consultation with patient 62:11032009)

Individual activities and actions are perpetuated in the 'practice memory of the organization' (Schatzki 2006, p. 1868). I understand Schatzki's idea of the 'organizational memory' (Schatzki 2006, p. 1870) as similar to 'the institutional order' outlined by Sarangi and Roberts (1999b). This order or memory is the way everything is set up, 'where resources are produced and regulated, problems are solved, identities are played out and professional knowledge is constituted' (1999b, p. 1). In Schatzki's terms, the organizational memory is made up of the 'sum of practice memories' (Schatzki 2006, p. 1870) of nurses and doctors in each ED. Thus in both definitions people, resources, identities and professional knowledge are interconnected. What this means in terms of learning is that junior staff's learning involves learning how to act according to the way things are, i.e. the prevailing doings, sayings and beings. In other words, the institution knows and remembers how to operate. Some of these memories are structured in the whiteboard below:

Picture 6:   Bed allocations for nursing staff, wall clocks, reminder notices, filing trays 'organising' work

Picture 6 is meaningful only to the nurses and doctors. Outsiders to the institution do not necessarily know how the ED operates. This is because, while patients might be familiar with what doctors and nurses do, they do not know how the ED works. Unbeknown to them, but familiar to the insiders, are the waiting times, the repetitive questioning, handovers, alternating nurses and doctors and *in situ* training (on them) which are regular and common across all the EDs researched.

These are the institutional practices, and although patients and the researchers (initially) are surprised by waiting times, constant handovers, repeated questions, inexperienced hands, for the clinicians this is normal work and most days and weeks are the same. Mondays are hectic; nights are quiet; shifts change two or three times a day; handovers happen constantly; notes are mislaid; radiography is slow; 'bed block' is problematic (Forero & Hillman 2008), and negotiating with the in-hospital team to admit patients is difficult (Nugus 2007). These are the regular 'unfolding[s] of performances and material events' (Schatzki 2006, p. 1866) – the rhythms and patterns (Schatzki 2006) of work in the ED.

Learning through peripheral participation (informal)

I include peripheral participation here under the 'informal learning' (arrangements) and also below under 'formal learning arrangements'. Under the 'formal learning arrangements' peripheral participation is clear and unambiguous: there are paired working arrangements, supervision etc. However, informally, the boundaries of participation are not always clearly defined and nurses, doctors and patients must establish the parameters of participating as they practise. This is because in the ED, as a working space, 'legitimate peripheral participation is at the heart of defining, or understanding, the nexus of relations through which situated learning occurs' (Macpherson, Antonacopoulou & Wilson 2010, p.5, and see also Nugus *et al.* 2010). As nurses and patients seek to participate in treatment processes and knowing, their doings, sayings and beings, structured through different knowledges and attachments to these, are not always seen as legitimate in the participation process (Macpherson, Antonacopoulou & Wilson 2010).

In Tables 11 & 12 there are several examples of how nurses and doctors enact disciplinary tasks and at the same time (although not always) index their authority (Heritage & Raymond 2005) and knowledge in the ED in relation to each other and to patients. Participation (whether peripheral or central) extends not just to doings but to sayings.

Nurses and doctors learn through peripheral participation: they learn who can say things, who can know things, who can do things and how things are said: these are prefigured by the prevailing practices.

As opportunities for learning arise, these can be missed in the relational and epistemological paradigms of contested practice knowledges. This is not a clear-cut process. For example, there are times when an experienced nurse defers to the authority of a junior doctor yet moments later or earlier the same nurse will challenge what the junior doctor does and/or says. The exchange below takes place during Jane Edna's consultation. In this interaction Nurse Bella (N2) offers a suggestion to Doctor Louis (D1), which could be construed as encroaching on a treatment option before Doctor Louis (D1) has reached such a decision himself:

N2   *Do you want me to put a cannula in or not?*
D1   *Ahh*
N2   *No? No way?*

However, shortly after this exchange Doctor Louis (D1) decides he does need a cannula after all. Doctor Louis (D1) and Nurse Bella (N2) resolve this amicably (example 11 in Table 11).

A little while on, Doctor Louis (D1) enacts his authority over Nurse Bella (N2) subtly, through intonation rather than in a formal request (example 9 in Table 11). Doctor Louis (D1) enacts his medical authority through his institutionalised authority over Nurse Bella (N2) as she is obliged to find the forms, and she goes to collect the form for him:

D1   *Pathology forms?*
N2   *Hm*
D1   *Pathology forms?*
N2   *I don't know ((Nurse Bella leaves to collect the forms))*

Learning (and knowing) are enacted in seesaw contestations through sayings, doings and beings as nurses, doctors and patients seek to participate in learning and working. Hierarchies surface epistemological possessiveness that is teleologically anchored. By this I mean that nurses and doctors are wanting to do different things (their goals are different); they see different things; they understand different things yet each must be sanctioned in a sense by the other (or by the general medical hierarchy) to proceed. Learning and knowing can be seen as abstractions glossing over the hurly-burly of *in situ* work, or as pointed out

in one of Araujo's earlier publications, '...the distinction between working, knowing, learning and innovating get (sic) rather blurred…[a]ll these activities are embedded in situated practices and are coextensive' (Araujo , 1998, p. 328).

However, based on the data above, doctors usually press ahead with their own doings when contested by nurses and when patients contest doctors' or nurses' knowledges, they press ahead with their own doings over what patients suggest. This relationship of dominance holds unless the emergent information is in a particular evidential form that is legitimised, i.e. temperatures, X-rays, allergies, illness narrative, etc. What this suggests to me, based on the data, is that doctors, nurses and patients are not always open to finding out things (learning/knowing?) when information is given outside recognised parameters of what each is entitled or expected to know.

In the game of legitimation information must be packaged in specific ways. The recent introduction of iSoBar handover protocols (Australian Commission of Safety and Quality in Healthcare) reinforces the desirability of packaging information in specific ways, as ambulance officers, nurses and doctors are increasingly required to structure their spoken handover texts. On the one hand, there is merit in doing this as it could save time – and possibly therefore a life as the structuring privileges particular kinds of evidence such as bio-medical knowledge. On the other hand, a fixed structure might constrain opportunities for providing information that may be relevant to the patient's condition but it might not be legitimised in this structure. In this case, protocols prefigure the learning/knowing game.

If information is not packaged appropriately, or if information is not consistent with a disciplinary or lay/expert paradigm, i.e. with what a nurse or a patient is *entitled to know*, the data show it can be either challenged or ignored. However, resistance is modulated if the evidence or legitimate information is something that the nurse is permitted to know (or in relevant history taking that the patient is permitted to know). In example 35, in Joel's consultation when Nurse Leah (N6) is able to advise Doctor Surita (D1) that Joel has a fever this is not contested: *There's a low-grade fever at the moment, 37.2.* This is legitimate nursing information that Nurse Leah (N6) has, based on the fact that she has taken Joel's temperature a short time back. Learning for Doctor Surita (D1) here is not just finding out temperatures, etc., but involves accepting the legitimacy of the knowing that affords 'finding out', i.e. the legitimacy of the meta-process.

What this means is that the potential for learning across disciplinary and across patient/doctor boundaries is restricted by each of the participants in turn – based on their legitimacy as knowers, and/or the legitimacy of their knowledge contribution. This is no more evident than when doctors circumscribe what they wish to hear from patients as they pursue template history taking protocols. For example, history taking is done in a particular format, i.e. doctors follow a set of rote questions as they pursue their differential diagnosis (Iedema 2011b). This format prefigures what is worth knowing, who can participate and how this participation must take place.

Legitimacy of participation is also evident between patients and clinicians. Nurses and doctors also make judgments on the legitimacy of patients' 'experiential knowledge[s]' (Neal & McKenzie 2010) or other knowledges. In Jane Edna's case, Doctor Louis' (D1) *in vacuo* medical knowledge is privileged (as it is enacted) over the 'experiential knowledge' (Neal & McKenzie 2010) of Jane Edna herself as a patient. In Joel's case, Doctor Surita's (D1) 'epistemic authority' (Heritage & Raymond 2005) is challenged on a number of occasions by the 'experiential' knowledge' of Joel and Joel's wife, Jill. As Jane Edna and Joel seek to participate nurses and doctors are selective in what counts as legitimate information when they interact with them as patients and/or their carers, as is evident in the thyroxin discussion (Table 11, example 55). In Joel's consultation, there are also examples that highlight the tensions in the contested landscape of interprofessional care (Table 12, example 9).

Nurses and doctors in Jane Edna's and Joel's consultations accommodate or resist information that is communicated to them and this occurs largely along disciplinary (or when patients are involved, along patient/doctor) lines. If information is consistent with their own disciplinary paradigms, or if it is packaged in a legitimised way (particularly when nurses seek to inform doctors, or when patients seek to inform nurses and doctors), then the more legitimate knower or 'other', in Vygotskian terms, will use this information. In this, nurses and doctors (even patients) undervalue participatory learning as each maintains their epistemological boundaries while working/being cared for.

Jane Edna and Jill (Joel's carer) seek to index their own authority over the bio-medical and institutional authority as they contest the junior doctor, the nurse or the institution, yet at other times they defer to the authority and expertise of the nurses and/or the junior doctor. Doctor Surita (D1) contests the knowledge of Joel's wife Jill throughout Joel's

consultation. Joel's wife is a trained nurse who has been looking after Joel for four years and documenting his health painstakingly during that time. She has, in the words of the ambulance officer, *an abundant (sic) of information* about Joel. Because of this knowledge, she challenges Doctor Surita (D1) on a number of occasions. She refers to outside specialists that he is seeing (thereby invoking other more knowledgeable expertise than his); she mentions that Joel is on cutting edge 'trial' medications (a further reference to state of the art scientific knowledge); and she provides Doctor Surita with a level of detail about Joel that he, Doctor Surita (D1), finds confusing and unnecessary.

And Doctor Surita (D1) works very hard to show that he, too, 'knows' about medicine but wants to know only certain things about Joel, not necessarily what Jill, the wife knows and wants to tell him. This underscores the differential valuing of what is seen as important to know in the ED, where each participant prioritises different information about Joel. The following exchange between Doctor Surita (D1) and Jill (F) illustrates the resistance they each face. Doctor Surita (D1) seeks to have information packaged in a specific way, i.e. as legitimised knowledge that he wants to hear in a specific way.

F   *So our immediate problem with this is he had a rod put in his leg for bone cancer, he has renal cell cancer*

D1   *Mm mm*

F   *With tumours in his lungs [..] and he's been on trial drugs at St [Williams ((name of hospital))*

D1   *[So primary site was [kidney?*

F   *[Kidney renal cell cancer which*

        has gone [

D1   *[With metastasis to lung? [*

F   *[Yes had a – and then has a – and then the last three or four months it appeared*

        in his bone

D1   *Okay*

F   *So we're – we're [*

D1   *[So pathological fracture as well?*

F   *Yes so they put [*

D1   *[A rod==*

F   *==A rod right through which they've got the [X-ray*

D1   *[(the left leg you are showing?)*

F   *Yes it's the left leg (I've just got things in my hand [so)*

D1   *[OK*

Joel's consultation is different from other consultations in the study in the intensity of the contestation between Joel's wife, Jill and the Junior Doctor, Surita (D1), who does not yet

know he can draw on Jill's extensive knowledge about Joel. Jill too is frustrated by Doctor Surita's (D1) line of questioning. There is potential for 'knowledge to be done together' (Gergen 1985, p. 270) – for participatory learning to occur especially as Jill uses more medical terminology and phraseology than is usual for carers: *immediate problem… renal cell cancer… trial drugs* and so on. Although when she says the cancer *has* gone, Doctor Surita (D1) queries expertly: *With metastasis to lungs…?* Jill also shows she understands medical code as the responds to Doctor Surita's (D1) questions: *so primary site was kidney… with metastasis to lung, so pathological fracture as well.* Almost every time Jill speaks, Doctor Surita (D1) interrupts her – a total of seven times; and she does the same to him. Doctor Surita (D1) circumscribes what information he wants from Jill – and she in her own way, disrupts the questioning trajectory he is on throughout the consultation.

Learning by doing (informal)

Learning occurs informally as nurses and doctors practise. Learning here might be identified as precipitating a shift in action, or for example, deference to an opinion or suggestion, thus in the latter case, legitimate participation is at the base of this learning. In their practice roles doctors and nurses resist information (if they do not perceive it as legitimate) and they resist participation from some colleagues. In such instances they seek to maintain their disciplinary authority and/or disciplinary isolation.

The episode (Table 12, example 6) where Nurse Janita (N2) moves Joel's leg without listening to Joel or the ambulance officers is such an instance. In this case Nurse Janita (N2) ignores her colleagues and the patient. Nurse Janita (N2) does not develop any shared knowledge with him and does not receive (or does not want to receive) the appropriate information from the ambulance officer or the triage nurse about Joel's pain. However, the complexity of work and what happens dynamically is evident. In this example Nurse Janita (N2) has the opportunity to learn something about Joel but she does not take up this opportunity. Instead, by moving Joel, Nurse Janita's (N2) doing enacts a way of relating, being, readiness and practical understanding of what is required or what is *permissible* as she works.

Nurse Janita (N2) is an experienced nurse who would ordinarily be expected to *know* that she should either check with Joel what is wrong with him, or at least *listen to* the two ambulance officers who are trying to tell her what is wrong with Joel. This raises the

question of why she proceeded as she did, enacting her hasty and ill-judged actions. Although it is not possible to establish why, I propose that her actions combine professional authority over the ambulance officers and Joel and the teleoaffectivity of her practice as a nurse. Her actions 'befall' her (Schatzki 2009, 2010b) as part of her 'relating' a nurse with professional experience: she relates to the ambulance officers and Joel in a particular way. She reacts in the moment based on her institutional (territorial) authority over the ambulance officers. Knowing is emergent, but her actions are steeped in a disciplinary paradigm.

After hurting Joel, it is possible that Nurse Janita (N2) *learns* about her practice. She must make up for the mistake and repair the relationship with Joel. Nurse Janita (N2) apologises to Joel after this event *Sorry darling… um* and all the participants recognise the very social basis of the need to apologise, and to have a laugh about what happened, to fix the misunderstanding and the need for Nurse Janita (N2) to re-establish her credibility. They must 'do society in situation' (Gherardi 2008, p. 522) and repair the social damage that has occurred. This repair work is crucial as Nurse Janita (N2) turns out to be one of Joel's allocated nurses.

This is the social dimension of practice of which Schatzki and Gherardi remind us. Schatzki identifies practices as having 'normative teleological orderings' (Schatzki 2006, p. 1864), in other words, what is done and said should reflect what (has always been) is done socially in a setting, or in this case, in such a predicament. Gherardi sees practices in similar social terms: something is required of all participants in this event to normalise the mistake that Nurse Janita (N2) has made. Joel too acknowledges Nurse Janita's (N2) expertise and says: *I forgive the lady, she does know what she is doing.* The ambulance officers show solidarity with her and agree that *she's got a little bit of an idea.* Nurse Janita (N2) did in fact *not* know what she was doing, but all participants play the game and reconstruct her actions in a positive light.

While both Doctor Surita (D1) and Doctor Louis (D1) resource their knowing through medical disciplinary practices, i.e. artefactual evidence (X-rays, blood samples), specific or tailored history taking – which they undertake with Jane Edna and Joel – they each resist resourcing their knowing across disciplinary lines. The data show that they resist input and advice across the relational (disciplinary) paradigm, from the more experienced, senior nurses and even from patients themselves. In Jane Edna's and Joel's consultations, nurses

and doctors rely on and accept selective legitimate forms of evidence, as defined by disciplinary and institutional exigencies and their own personal knowledges: this is a disciplinary-based knowing paradigm and resonates with findings from other studies (see also Creswick, Westbrook & Braithwaite 2009; Paul & Reddy 2010b).

Learning is thus confined to particular knowledges only, particular packaging of information and to particular relationships of learning (Creswick, Westbrook & Braithwaite 2009). Alternatively learning may be understood as playing the following games: *post hoc* legitimisation, deligitimisation, compromise and so on. Learning/knowing in this way might be seen as essentially a contestation over what prevails in a certain situation, marking deference (learning) and authority (knowing). Learning and knowing are thus mediated epistemologically and interpersonally – and in the ED this happens to be disciplinarily, which impacts on the relational dealings of nurses and doctors. Knowing/learning involves making specific knowing 'prevail'; there is a social contest about what counts as knowledge in that moment.

5.4. Formal learning arrangements

Below I consider more formal learning arrangements in the ED (how nurses work in pairs, how junior doctors resource more senior doctors) for nurses and doctors in isolation from each other.

Learning through (peripheral) participation in practices, i.e. being supervised, being mentored, paired working

The ED site produces its own unique learning opportunities based on staffing (and training) requirements. These generally involve regular more experienced nurses working with inexperienced junior doctors on rotation. Thus, Nurse Leah (N6) checks on whether Doctor Surita (D1) is writing down the history (example 30). As an experienced nurse she is concerned about Doctor Surita's (D1) inexperience.

In Jane Edna's consultation, Nurse Noreen (N3), who is more experienced, teaches Nurse Cate (N4) to nurse patients. This learning takes place in an organised, pedagogic system that pairs them. Nurse Cate (N4), who does not yet fully know exactly what to do, predicts what she thinks Jane Edna requires. She scaffolds her actions through talk: what I later refer to as a pre-emptive or predictive practice. At this stage of her learning she is very

focused on the protocols of her practices, such as the institutional information that is needed or the task that is at hand – e.g. getting an ECG done – rather than on knowing what has transpired before with Jane Edna (example 17). As she approaches Jane Edna she says: *We're going to have to do a cardiograph and check your heart.* Her more experienced colleague, Nurse Noreen (N3), who is training her, tells Nurse Cate (N4): *She already had an ECG so it's just cardiac monitoring.* (N4) *Okay, okay, yeah.* (N3) *This one and she had another one at 11.10, so it's just cardio (sic) monitoring.*

Nurse Cate (N4) (a newly graduated nurse) can only learn to be a nurse – her knowing in action – and develop her practical understandings in the here and now *in situ* with Nurse Noreen (N3).

Doctor Surita (D1 for Joel) and Doctor Louis (D1 for Jane Edna) work with their more senior doctors in the backstage to 'work up' Joel and Jane Edna. Some decisions they make by themselves such as Doctor Surita (D1) who decides how to medicate Joel. In other situations, they work with colleagues. Doctor Edwina (D3) comes to give Jane Edna her diagnosis at the end of the day. Doctor Louis (D1) and Doctor Surita (D1) can only learn how to practise and take a history with a patient by doing this under the direction of their more senior doctors *in situ*, even though they have broad *in vacuo* knowledge of what they can *theoretically do*, as a result of their medical studies. Nurse Cate (N4) learns from Nurse Noreen (N3), and Doctor Louis (D1) and Doctor Surita (D1) learn from their more senior counterparts, which is a crucial process of their professional formation, i.e. they are there to hone their skills or learn by doing in history taking, diagnosing and relating to patients. Even though learning from their supervisors is important, on occasion the mentoring process is inadequate (see example 5 in Table 15 below).

Learning by doing (apprenticeship)

The way the learning by doing model unfolds in practice is evident in Jane Edna's and Joel's consultations. Doctor Surita's (D1) developing expertise is evident in the number of times he returns to Joel's bedside to further resource his knowing. He has not written down the early answers from Joel. He forgets or wants to recheck what Joel has said to him in the beginning and must return on numerous occasions to go over details. He orders an X-ray, and takes two blood samples for Joel. His expertise (or expert knowledge) as a doctor is questioned both by Jill, Joel's wife, on several occasions and by Nurse Leah (N6)

who observes him closely and checks on his procedures during the time they are together at Joel's bedside.

Doctor Louis' (D1) inexperience is evident from the broad lines of investigation he pursues over 11 hours with Jane Edna. He orders a chest X-ray, a CT scan, three ECGs and a blood sample, and gives her medication for acids in her stomach, morphine for the pain, etc. In both Jane Edna's and Joel's consultation, their previous notes (and X-rays in Joel's case) are not immediately available. As a consequence, both junior doctors must elicit each patient's previous medical histories again. During the consultation, both these junior doctors have diagnostic and institutional pressure on them to 'diagnose' and come up with what Nurse Leah (N6) terms *the grand plan* and in these two consultations, as in others, they work mostly alone in this endeavour up to the provisional diagnosis stage. Although they theoretically have access to more senior doctors, in practice this is hampered by time (availability of the senior doctors), space (if they can find them) and willingness of the senior doctors to be available (see example 5 in Table 15).

This apparently solitary activity of both junior doctors fits with what doctors in particular have been traditionally taught in medical education where medical rather than social knowledge is emphasised and individual knowledge is seen as a commodity, located in them as individuals, 'treated as private capital' (Bleakley 2006, p. 152). While the junior doctors may work in an apparently solitary fashion, it is evident that the more senior nurses in Jane Edna's and Joel's consultations are closely monitoring what they are doing. Overall, however, the working and learning arrangements for nurses are more socially organised: nurses generally work in pairs whereas the junior doctors work alone.

Learning in vacuo through reflexive or in-service training sessions

In most EDs (mostly for doctors, although nurses do attend some of these) there are weekly or even daily Grand Rounds, meetings or get togethers that discuss cases, incidents, resolutions, etc. These are more formal ways of learning *about* practices.

An *in vacuo* instance is exemplified when a senior nurse gives three others a training session on a piece of equipment at the foot of Joel's bed for a test he needs to have done. They watch the procedure but do not engage themselves. When the session is over the nurse explains to Joel what they have been doing: *Yeah. Just a little in-service while you were waiting.*

5.5.　Learning as emergent and past, present and future-oriented

In Chapter Two, I drew on Schatzki's notion of how actions that unfold in chronological time are connected to practices located in teleological time. In teleological time, actions are (located in the past) responses to the past, while (individuals are) motivationally focused on the future: this is 'a joining of the teleological, past, present and future' (2006, p. 1871). From the analyses above, learning (practices) in the ED reflect(s) this history, a present and a future. Pedagogical approaches are a blend of historical, current and yet-to-be-fully-developed/understood theorisations in medical and nursing contexts. Theories of individual acquisition (psychologically-based theories) merge with more recent sociocultural approaches (participatory theories) and now postmodernist theorisations, i.e. emergent approaches to learning, where

> learning is emergent from its context in unanticipated and unpredictable ways.
> Thus context transforms learning in an ongoing creative process. The modernist
> aims of decidability and predictability are unrealistic according to these theories
> (Hager 2011, p. 23).

The analyses above propose that learning is located in practices and in social and material elements of work. Hager questions, '[i]f practices can have emergent properties, then why should not the same apply to the learning that accompanies their transformation? (2011, p. 24). The above analyses have illustrated learning as complex and emergent (Colville 2011, 2013; Engestrom 2008; Fenwick 2009; Gherardi 2006; Schatzki 2009) yet as enacted, there are multiple approaches simultaneously present including traditional individual, disciplinary and acquisition-based ones.

While there are informal learning spaces in hospital settings where nurses and doctors learn from each other (Hunter & Scheinberg 2012), overall, the pedagogic arrangements in the ED are disciplinarily based – 'the degree of participation, its legitimacy and its centrality to [the ED's] practice communit[ies] are together all at the heart of defining situated learning trajectories' (Macpherson, Antonacopoulou & Wilson 2010, p. 6). In the ED, there are no overt arrangements that facilitate doctors learning from nurses, nor are there overt arrangements to facilitate nurses learning from doctors. This would seem reasonable given that nurses and doctors know different things and are, in one sense, interested in different things.

Even though policy documents encourage interprofessional practice with the implicit intention that nurses and doctors will learn from each other in acute care services (Garling 2008), learning is rarely inter or cross-disciplinary. Information that is shared between nurses and doctors will be mostly about a patient's immediate health status (Reddy & Spence 2008): nurses and doctors do not share with each other, in a pedagogic sense, their practice knowledges. This is because their practice knowledges are tied to their teleoaffective motivations, their desires, emotions and beliefs, and these diverge. Some have claimed that the interpersonal dimension of participation (relational) may perturb otherwise prefigured hierarchies of knowing (Cook & Brown 1999), but there were not many examples of this in Jane Edna's or Joel's consultations.

Based on the data above the distribution and valuing of knowledge is unequal and nurses and doctors have very different practice knowledges, also identified in earlier research (see work of Cicourel, 1994 referred to in Gherardi 2006, p. 193). In Tables 11 & 12 nurses and doctors engage in selective resourcing and selective displays of information with disciplinary-affiliated colleagues (Creswick & Westbrook 2008; Creswick, Westbrook & Braithwaite 2009; Nugus *et al.* 2010). Contu & Wilmott identify communication as central to how this informational selectivity occurs in practice. They found that

> actions that comprise learning are thus conceived to be embedded in their historical conditions of possibility, and language is understood to be the principal medium of communication for the (re)production of social practices (Contu & Willmott 2003, p. 287).

In their words, ''information sharing' within 'communities' [is] historically contingent' (Contu & Willmott 2003, p. 294). Communicating and transferring information is therefore not necessarily the central problem in managing care and safety. Rather teleologies and hierarchies of knowledge and knowing mediate, through practices and practice memories, what clinicians learn or know from each other and from patients in the ED. A practice theory approach helps to understand how learning is anchored therefore not just in the moment, but also in the relational (disciplinary) paradigm of doctors' and nurses' practices (Cook & Brown 1999; Johnsson 2009). Thus, knowing, although portrayed as emergent, is also connected to the epistemic legitimacy of doctors, nurses and patients, which is teleological, teleoaffective and extra-situational, i.e. it is not only situated in the here and now but also anchored in a past and a future of hierarchical expertise. Unfortunately,

learning that may arise through an incident that harms a patient such as occurred with Nurse Janita (N2), is frequently *post hoc*; but it alerts us to the relational aspects of knowing as identified above.

Although the above data have illustrated that disciplinary attachments and knowledge hierarchies are constraints that implicate collaborative practice, learning and knowing, institutional arrangements also ensure that formal and informal pedagogies and practices in the ED further embed practice and knowledge hierarchies. The data have shown how the organizational memory of the ED, made up of the sum of practice memories, is maintained through practices – learned through prior learning as well as through implicit and explicit pedagogies in the ED. These are institutional and practice teleologies that ensure disciplinary practices (and respective knowledge hierarchies) prevail.

The ED is its own learning timespace. In the ED, nurses and doctors work together: the 'paths and places' (Schatzki 2009, p. 41) of nurses' and doctors' work are anchored in the materiality of the ED – they come to work in this space because each of their groups carries out particular activities, through specific actions, that underpin respective disciplinary practices. These are combined in the ED and work as 'mutually understood' practices and as such, their practices in Schatzkian terms are 'orchestrated' (Schatzki 2009), i.e. the ends are not independent of each other – both want patients to be well – but nurses undertake different actions, and their practices are governed by different general and practical understandings, rules, protocols and teleoaffective facets from those of doctors. Because of these differences, nurses and doctors act in partly shared and partly conflicting spatialities – historical and future spaces of beings, doings and sayings, as each group can legitimately pursue related or 'orchestrated' ends in caring for patients. But they also contest each other and have to compromise.

In Chapter Six, I explore further the learning timespace of the ED, through the meta-disciplinary and institutional practice framework. This framework illustrates how nurses and doctors draw on extant practices yet *learn* to adapt these to the spatio-temporal and sociomaterial setting of the ED.

In summary, knowing and learning are enacted in disciplinary, institutional and idiocentric – 'centred on individual tasks, roles and interactions with the patient' (Manidis & Scheeres 2012, p. 112) – ways. As a consequence of the idiocentric work and the temporal flow of the consultation, nurses and doctors have unique disciplinary-based experiences and they

enact unique actions in the interwoven activity of the ED. They have different epistemological interests, and understandings in and of their practices, reflected in their respective doings, sayings and beings. These differences are overtly sanctioned through disciplinary practice. The model of care in the ED is premised on nurses caring for patients and doctors treating them, even though the actions and activities involved in these, frequently and increasingly, have very blurred and contested boundaries.

The data have shown that learning, knowing, communicating (and working) are embedded in disciplinary paradigms (see also Contu & Willmott 2003; Gherardi 2006; Green 2009a; Kemmis 2009; Nicolini *et al.* 2008; Sarangi & Roberts 1999b; Zukas & Kilminster 2012) and involve games of contestation or legitimation.

The model of care in the ED relies on information transfer. The learned disciplinary practices and knowledge hierarchies maintained above through institutional and practice teleologies once again challenge the information transfer paradigm of current ED care.

5.6.   Concluding comments to Chapter Five

In Chapter Five I outlined how working, learning and knowing might be connected. I examined professional formation prior to and in the ED. I explored how learning is situated within disciplinary streams and how nurses and doctors learn practices in embodied, institutional and disciplinary ways. Practices are learned in which nurses and doctors enact or participate (Gherardi 2006; Lave & Wenger 1991; Schatzki 2002) – in multiple ways.

I presented disciplinary activities in Jane Edna's and Joel's consultations with examples of interactions showing that through sayings, doings and beings, nurses and doctors index epistemic authority over each other (Heritage & Raymond 2005) and over patients (Neal & McKenzie 2010) and thereby maintain teleological disciplinary hierarchies and differential valuing of knowledges (and learning) in the ED (see also Contu & Willmott 2003).

I conclude that understanding professional learning as emergent and teleological – past, present and future-oriented – is central to understanding practices as collective and extra-individual (Kemmis 2009). Doings, sayings and beings are learned and perpetuated in relations and situations that are bound together over time, connected through knowledges and teleoaffectivity. Understanding this shifts the focus away from individual nurses and

doctors as communicators to their sayings, doings and beings as embedded in practice knowledges (Reckwitz 2002; Schatzki 2009).

Learning across disciplinary and patient/doctor lines is complex and working across these boundaries remains contested, further compounding how nurses and doctors communicate and resource their knowing.

In Chapter Six I explore how nurses and doctors resource their knowing by examining their information seeking practices in the ED. I explore what these practices mean for individual and team knowing as doctors and nurses navigate the space, time, relationships and material arrangements of the ED.

Chapter Six – Knowing/not knowing (practices)

Purpose and flow of this chapter

In Chapter Six I explore the unfolding of the performances of nurses' and doctors' activities and actions in the ED. I trace how nurses and doctors' knowing is enacted in iterative, non-linear, disconnected and 'mangled' (Pickering 1993) ways, involving (paradoxically) not knowing. I explore what this means for individual and team knowledge and knowing as care happens. I also examine how nurses and doctor enact iterative and idiocentric visits to Jane Edna's and Joel's bedsides as end-directed activity as they care for them.

I identify that in the timespace of the ED, not knowing is a prominent feature of ED work because of the uncertainty and complexity of medical work, the space and time over which consultations take place and, in part, the inexperience of junior doctors.

I then examine knowing/not knowing as a contingent space showing how nurses and doctors value patient details in idiosyncratic ways, understand items differently, misplace or forget (Talbot & Bleetman 2007) them, need to negotiate and/or alter them in practising. I examine these findings in the light of the ED's model of care, premised on healthcare's view of knowledge (Nicolini *et al.* 2008).

I illustrate how nurses and doctors (learn to) work with things unknown through activity: knowing is an ongoing accomplishment – 'constituted and reconstituted every day [and in every action] in practice' (Orlikowski 2002, p. 269). I propose that knowledge is located in praxis that is collectively and individually sustained rather than located securely in information-transfer models of work.

I conclude Chapter Six by situating team (and individual) communication and knowing in a complex paradigm of practice. I identify that ED work is precarious and propose that the complexity of this work will increasingly challenge the safety of patients and the ability for nurses and doctors to cope in this system.

6.1.   Nurses' and doctors' iterative activities

Chapter Four examined how knowledge is intended to be networked and (re)produced across roles and statuses through knowledge networks that link clinicians to Jane Edna, to

Joel and to each other at a macro level. Chapter Four also examined how knowledge is (re)produced at a micro level (at Jane Edna's and Joel's bedsides) through individual patient-clinician interactions involving objects, language, people, doings, sayings and beings. I now examine how these macro and micro levels of work are linked through the activity of successive visits to Jane Edna's and Joel's bedsides.

I propose that the iterative visits to Jane Edna's and Joel's bedsides provide a meso level analysis of how team and individual knowing is enacted, as the visits embody – as nurses and doctors move physically in the ED space – knowing and not knowing. The visits to the bedsides are not the practices *per se*, but are central activities and actions involved in medical and nursing knowing/not knowing. Nurses and doctors get information from, and enact care in close proximity to, patients but in very different ways, through touch, gaze, examination and talk. In the manner that they are disciplinary, the visits point to the rhythms and patterns of the way practice order bundles (Schatzki 2006) are enacted, or unfold, in the ED's organised model of care.

Below in Charts 1 and 2, I present statistics of the number of disciplinary visits to Jane Edna's and Joel's bedsides.

Disciplinary visits to Jane Edna's bedside
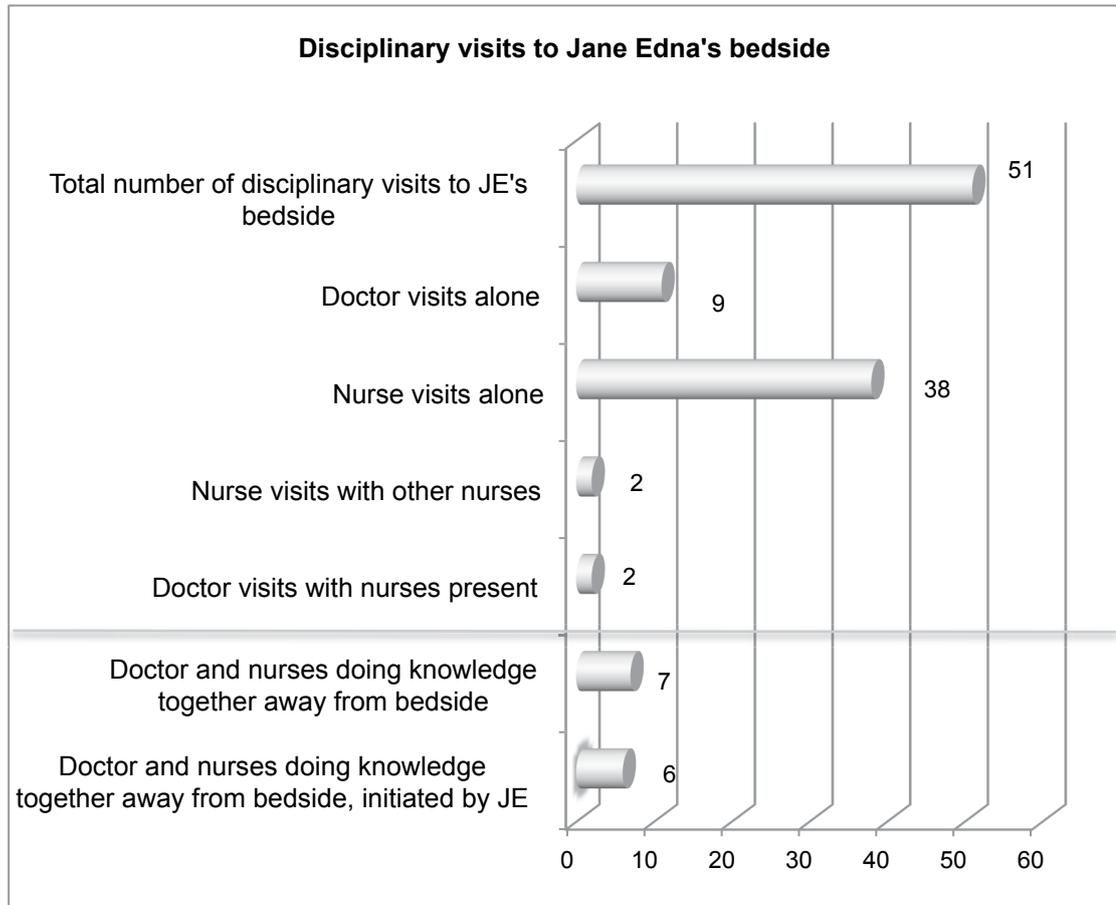
Chart 1:   Visits to the bedside of Jane Edna (JE) (modified from Manidis & Scheeres 2012, p. 111)

What is immediately evident from Chart 1[22] is that the visits are idiocentric. For example, Doctor Louis (D1) interacts with Jane Edna by himself on nine out of the 11 occasions that he sees her, and the nurses interact with Jane Edna by themselves (alone) 38 times out of the 40 times that they talk to her. Although these visits are part of the team's work, Doctor Louis (D1) acts on his own.

Although Doctor Louis (D1) engages with Jane Edna far fewer times than do the nurses, his discussions with her are considerably longer, particularly during the initial history taking (half an hour) and in his discussion with Jane Edna when he decides to organise a CT scan for her. The aged care nurse, Nurse Pamela (C1), spends the greatest time talking to Jane Edna of all the nurses, and stays 15 minutes with her on one occasion alone. Nurse Bella (N2) who changes Jane Edna into a hospital gown and does her initial ECG spends an

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[22] The line across the chart separates disciplinary visits to the bedside from those that occurred away from the bedside.

hour in the room while she is changed, has a cannula inserted and an X-ray taken. Nurse Bella (N2) and Doctor Louis (D1) do discuss the cannula, and the Anginine that Jane Edna has been given, but their interactions are few and principally procedural and not related to Jane Edna's illness: Nurse Bella (N2) finding the pathology forms, locating the stickers, finding the ECG machine, etc.

Over the consultation, there is little medical information exchanged between the nurses and Doctor Louis (D1) and when there is – how much Anginine Jane Edna has been given – Nurse Bella (N2) obtains this information from the notes written down by the ambulance officers. In contrast to his discussions with the nurses, Doctor Louis (D1) spends more time receiving information from the ambulance officers at the bedside than he does from any of the nurses as he has a thorough handover from the one ambulance officer who brings Jane Edna into the ED. Later he remembers very little of this exchange, which I illustrate below. On seven other occasions the nurses seek advice from Doctor Louis (D1) away from the bedside: Jane Edna instigates six of these discussions.

Only twice during Jane Edna's consultation does Doctor Louis (D1) share the bedside space with the nurses: the first occurs in the resuscitation room and the second time they share this space is when Jane Edna suddenly experiences pain again and this precipitates a visit by Doctor Louis (D1), Nurse Pamela (C1), the aged care nurse, and Nurse Peter (N5). This visit occurs when the nurses suggest a provisional diagnosis to Doctor Louis (D1) for Jane Edna. On both these occasions there is little discussion about Jane Edna's illness. On other occasions Doctor Louis (D1) does request the nurse(s) to check things or do things for him.

Nurses caring for Jane Edna spend only two occasions together (in pairs) at her bedside. The first time they do this is when Nurses Noreen and Cate (N3 and N4) settle Jane Edna and do their observations. On this occasion they spend some time together at her bedside (seven minutes in total). The second time they are together at the bedside is when Nurse Peter (N5), Nurse 6[23] (N6) and Nurse Pamela (C1) are co-present with Doctor Louis (D1) as the pre-diagnosis is discussed. For the remaining care and observation times, nurses just pop in and out briefly, or spend a short time doing observations (Strange 1996). They also engage only minimally with each other about Jane Edna at the bedside. Although Doctor

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[23] Nurse 6's name was not obtained, hence she was not given a pseudonym.

Louis (D1) and nurses and even the nurses themselves spend little time together at the bedside talking about Jane Edna, they rely to some extent on each others' doings and sayings in other ways. Doctor Surita (D1) and Doctor Louis (D1) expect (or may read in the notes) that the nurses have observed Jane Edna and Joel, taken their temperatures, admitted them, and written down their medications and so on.

In Joel's consultation, the breakdown of disciplinary-based visits to the bedside is given in Chart 2 below.

Disciplinary visits to Joel's bedside

Category	Value
Total number of disciplinary visits to J's bedside	39
Doctor visits alone	6
Nurse visits alone	22
Nurse visits with other nurses	5
Doctor visits with nurses present	6
Doctor and nurses doing knowledge together away from bedside	0
Doctor and nurses doing knowledge together away from bedside initiated by J	0
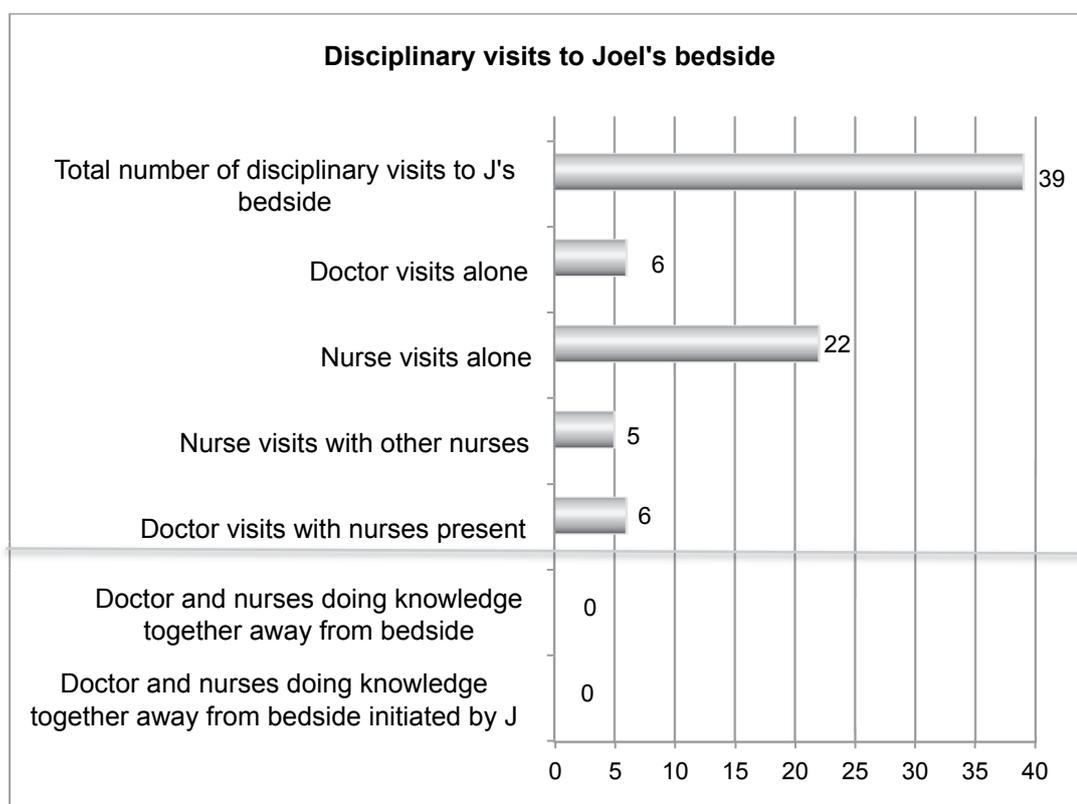
Chart 2: Visits to the bedside of Joel (J)

Doctor Surita (D1) and Joel's nurses also largely pursue idiocentric disciplinary interactions and activities at Joel's bedside. They share the bedspace more than in any other of the study's consultations, but again the way the rhythms and patterns (Schatzki 2006) of the performances of their practices unfold, constrains opportunities for interprofessional work, and provides limited opportunities for collective knowing about Joel.

When Jane Edna and Joel's consultation visits are compared, the same trend lines of disciplinary information-seeking activities are evident. The magnitude of codified

knowledge that nurses and doctors must manage just for one patient, let alone several, challenges knowing.

Disciplinary visits to the bedsides: Jane Edna and Joel compared

Category	Jane Edna	Joel
Total number of disciplinary visits to Jane Edna's and Joel's bedsides	51	39
Doctor visits alone	9	6
Nurse visits alone	38	22
Nurse visits with other nurses	2	5
Doctor visits with nurses present	2	6
Doctor and nurses doing knowledge together away from bedside	7	0
Doctor and nurses doing knowledge together away from bedside initiated by Jane Edna and Joel	6	0

Chart 3: Comparison of visits to the bedsides of Jane Edna and Joel

These charts confirm that knowing is distributed and is a distributed capability (Orlikowski 2002). The multiple visits also suggest that knowing is an activity, made up of isolated actions – what Schatzki would call an 'event' (Schatzki 2011). Nurses and doctors perform these actions iteratively and mostly face-to-face, based on the 'enduring' and extant practice of talking to patients (Roter 2000). As such, these multiple visits reflect what I understand to be a practice response by nurses and doctors to the spatial, temporal, social and material configurations of the ED (and its patients), its timespace, which I explore below. At the same time, the multiple visits raise questions about practice change in the ED, particularly if talking to patients is central to what nurses and doctors do with patients (Ayatollahi, Bath

& Goodacre 2013; Sarangi & Roberts 1999b, p. 21) and especially as the magnitude of the visits suggests activity entropy as shown above and informational entropy as I examine below.

Before exploring the ED timespace, I examine what transpires in the interactions at Jane Edna's and Joel's bedsides during these multiple visits. In particular, I focus on what nurses' and doctors' doings, sayings and beings reveal about knowledge and knowing/not knowing, whether collective or individual.

6.2.   Knowing/not knowing: collective and individual

I begin with an overview of how knowing/not knowing unfolds for the team caring for Jane Edna. Examining Table 13 first, Column 1 identifies a nurse or a doctor caring for Jane Edna; Column 2 temporally situates what is known about Jane Edna at a particular time; Column 3 indicates what is passed on or 'should' be known; Column 4 presents some of the processes of documenting or transferring what is known, whether details are conveyed and/or used. Column 5 charts the 'Outcome', evidence of action or lack of action arising from what has been previously known, transferred, utilised (or not). This final column indicates whether knowing is accomplished – or not.

Clinician	Time	What is known about Jane Edna *	Tells/documents *	Outcome
Ambulance officer (A1)	11.00am	A1 tells N1 that Jane Edna has macular degeneration	A1 to N1 and also discussed with D1; documented in triage notes	Neither D1, nor N5, nor N4 draw on this information and all three clinicians ask JE in subsequent visits to identify something visual. She explains to each in turn that she can't see
Ambulance officer (A1)	11.29am	A1 tells N1 and then D1 that Jane Edna has been given Anginine	Recorded in triage notes	Although both D1 and N2 are present they do not hear (or remember) this information and need to check it themselves 10 minutes after being told
N1		N1 is told that Jane Edna wants to be called Jane (her name is officially recorded as Edna Jane in the notes)	No evidence any one tells anyone else or whether this is documented	On 12 different occasions nurses, doctors and orderlies get her name wrong: approaches to Jane Edna indicate that attending clinicians have not been told what her name preference is
D1	12.57pm	D1 tells Jane Edna she can't eat	No evidence that this is written down	Jane Edna does not accept this ruling and asks for a sandwich; N3 offers her a sandwich; N3, an experienced nurse does not read the notes: N3 is told by the researcher that Jane Edna is nil by mouth
N5	18.10pm	Jane Edna has had two ECGs by the time she sees N5 again	Recorded in the notes	N5 asks Jane Edna if she's had an ECG earlier: N5 does not read the notes, but has attended to Jane Edna earlier and has had a handover
N2; N4 (three times); D1 (twice); Ra2 (twice); N1 (twice)		Jane Edna has her allergies checked 10 times	Recorded in the notes	Repetitive checks on her allergies (10 times by those listed in column 1)

Table 13: Collective not knowing about Jane Edna

* (Data based on audio-recordings and annotations from field notes)

Despite verbal exchanges between nurses and doctors in handovers, details about Jane Edna are not recalled and items that are recorded in the notes are not always utilised during or just prior to interactions with her on several occasions. Yet nurses and doctors who look after her do source what they need to know to do their jobs over and over again, and talk with Jane Edna appears to be the quickest (the most persistent or preferred way) (see Ayatollahi, Bath & Goodacre 2013) to source (recover or recheck) what they need to know. These details are materialities (of codified knowledge about patients) that nurses and

doctors refresh through iterative doings and sayings as their actions unfold in the complexity of ED work.

I discuss, later in this chapter, the implications of collective not knowing about Jane Edna illustrated in Table 13 above. In order to understand how patient details are reconstituted iteratively, i.e. through knowing as activity and not as possession, I examine the way that this occurs with Jane Edna's name preference. Thus, below I trace one particular aspect of Jane Edna's story. Jane Edna is recorded on arrival at the ED as LAST NAME [Surname] FIRST NAME Edna. She does, however, have two first names, i.e. Edna Jane, but prefers to be called Jane, which is not documented anywhere but the fact that nurses, doctors and others fail to use her preferred name is a constant problem for her during the consultation.

I begin with Jane Edna's triage notes, which do not include her name preference even though she tells the triage nurse what she wants to be called. Another key item missing from Jane Edna's triage notes are the ambulance officer's (A1) comments to the triage nurse that Jane Edna has a history of heart disease. Both of these omissions may be because the triage nurse is only required/permitted to write down symptoms: personal and biomedical information are excluded from (or not legitimised in) the triage notes.
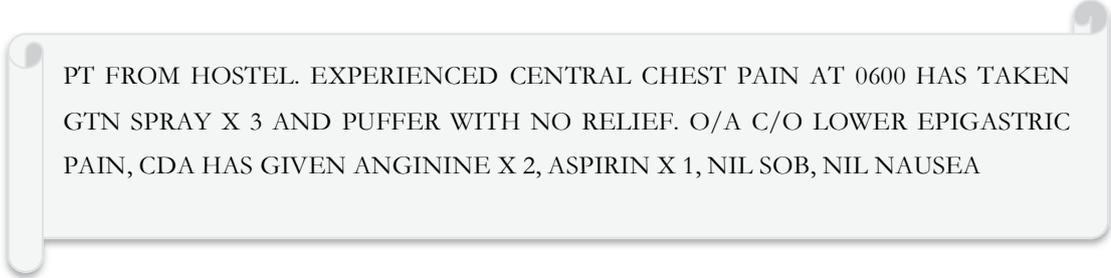
> PT FROM HOSTEL. EXPERIENCED CENTRAL CHEST PAIN AT 0600 HAS TAKEN GTN SPRAY X 3 AND PUFFER WITH NO RELIEF. O/A C/O LOWER EPIGASTRIC PAIN, CDA HAS GIVEN ANGININE X 2, ASPIRIN X 1, NIL SOB, NIL NAUSEA

Document 1: Jane Edna's triage notes

As the ambulance officer introduces her to the triage nurse, after her arrival at the ED at 10am, Jane Edna's name saga begins:

At 10am

On arrival at the ED, as the ambulance officer hands over to the triage nurse N1, Jane Edna corrects his use of her name:

A1   *Okay this is* **Edna** *((surname))* [*ninety*

P   [*Called* **Jane**

A1   *Sorry*

P   *Called* **Jane**

A1   *Called* **Jane** *ninety-five year old lady who lives in um the hostel section um at ((hostel's name)) it's called …*

At 10.15 am

A short time later, A1 again uses her formal name as she hands over to N2 in the resuscitation room. Again Jane Edna corrects her use of her name. N2 picks up on this and asks if she can call her Jane:

A1   *Okay now this is* **Edna** *((surname))*

P   **Jane**

N2   [*Jane*

A1   [**Edna Jane** [*((surname))*

N2   [*Jane can I call you* **Jane?**

P   *Yes you can if you like*

A few minutes later

A1 continues to call her by her non-preferred name, but then adds a 'Mrs' to the beginning of this non-preferred name. Jane Edna does not say anything about this. When Doctor Louis, D1 then calls radiography, he uses her official name as well:

A1   *How old is your* <u>spray</u> **Mrs Edna?**

P   *Pardon?*

A1   *How old is your* <u>spray</u> *when did you open it?*

P   *I'm just trying to think, would only be a day or two not any more I don't think*

Later on after Doctor Louis has spent time with Jane he calls for the mobile X-ray:

D1   *((on phone)) Yes I have got a* <u>lady</u> *in 'resusc' 2 we need a chest X-ray mobile please her surname is ((patient's surname)) ((repeat of patient's surname)) yep, first name* **Edna**, *she's at um – 'resusc' 2, chest X-ray mobile yep thanks 'bye ((shuffling papers))*

At midday

When N4 is settling Jane Edna, she also calls her by her non-preferred name.

N4   *Okay so* **Edna** *I've told the – I've told the doctor about this pain you're having and he wants me to give you a medication in case the pain you're getting is from the acids in your tummy so…*

Just after midday

Shortly after this, N4 begins the official admission. Jane Edna indicates she would like to be called Jane and N4 says she'll make a note of that. However no one seems to pick up on this preference:

N4   *And can you tell me your full name?*

P   **Edna Jane** *((surname))*

N4   *Okay*

P   *I'm called* **Jane**

N4   *Ah you're – so, you're called* **Jane?** *Okay I'll make a note of that one, okay so I'm going to give this medication through this little drip in your <u>arm</u> here ((a few minutes go by))*

N4   *Okay, so did you say you prefer to be called* <u>**Jane**</u> *is it?*

P   *I am called* **Jane** *yes*

N4   **Jane**, *okay alrighty, okay now I just want to ask you some questions just about all of your belongings um I'll start from the top, do you have any false teeth in your mouth at all?*

At 12.11pm

Doctor Louis returns later and calls her Edna on two occasions. She does not correct him.

D1   *Hello* **Edna** *how are you doing?*

P   *Thanks well thank you so much thank you*

D1   *Okay alright* **Edna**

At the end of this short discussion D1 says to Jane Edna:

D1   *Okay? Alright,* **Eddie***.*

At 12.52pm

When Doctor Louis returns later, he uses both her names. He may have been told after mentioning 'Edna' that she preferred to be called 'Jane':

D1   <u>*Okay*</u> **Edna** *now ((doctor returns at 12.52pm))*

       ((a little later))

D1   *That's alright, alright* **Jane** *that's it*

       ((a little later still))

D1   *Hi* **Jane** *just wait for the…*

P   *Pardon?*

D1   *We'll just wait for the um radiographer to take you to the – to the scan okay*

Just after 1 pm

N3 makes the same mistake when she is doing her rounds. She does however make an effort to talk to Jane Edna about her name and apologises for calling her Edna:

N3   *Edna*

P   *Jane*

N3   *Sorry is that what you like to be called **Jane?***

P   *I'm **Jane** yes*

N3   *And you...?*

P   *Yes I'm called **Jane***

N3   *You're called **Jane***

P   *Yes*

N3   *Okay is that your middle name or just …?*

P   *I was christened **Edna Jane** but always called **Jane***

N3   *Yeah okay um I'm afraid that I can't give you your sandwich just yet because we have to wait 'til you've had your scan*

Just after 2 pm

N5 who is the new nurse on the shift uses her name for the first time on his second visit.

N5   *As you know **Edna**, the doctor wants – doesn't want to let you have anything to eat or drink just right at this moment until you've had the scan. Okay?*

Then shortly after on his third visit, he calls her Edna again. Jane Edna is very quick to correct him this time:

N5   *((N5 returns later for his third visit)) **Edna** just need to check this for you*

P   *My name's **Jane** ((distant from microphone and said very softly)) excuse me I did ask if I may go to the toilet ((N5 washes his hands)*

Just after 14.07pm

Even though Jane Edna has recently asked him to call her Jane, he forgets this and returns to her saying:

N5   *(Just to let) you know **Edna** the doctor wants – doesn't want to let you have anything to eat or drink just right at this moment until you've had the scan okay?*

At 15.55pm

When the orderly comes to collect Jane Edna to take her to radiography he is embarrassed by getting her name wrong. He doesn't introduce himself and also apparently does not know that Jane Edna can't see (is blind) even though she has told three people by this stage:

O1   *How are you **Edna?***

P   *I'm not too bad thank you, who am I speaking to?*

A little later:

O1   *I'm yeah that's fine I'm going to move the wheelchair closer* **Edna**

P   *Thank you, you can call me* **Jane**

O1   **Jane**

P   *Yes*

O1   *That'd be nice if they let us know wouldn't it*

P   *((chuckles))*

Just after 5pm

The orderly who returns Jane Edna to her bed after radiography has to ask her name. He did not know where she was going nor did he know who was with her:

O2   *I've just got to page that's it*

O2   *Okay right what's your name?*

P   **Jane**

O2   **Jane** *hello* **Jane**

At 17.10pm

D1 comes to see Jane for the start of his 9th visit and greets her with:

D1   *Alright* **sweetie***, how are you?*

At 18.05pm – further confusion

N5 who returns to Jane Edna several hours after their first encounter, once again has forgotten her desire to be called Jane. Not only does he get her name wrong but also doesn't know that she's had two previous ECGs on the day already:

N5   **Edna** *we're just going to do an ECG as well, have you had one of these before? ((N5 does not 'know' she has already had two ECGs))*

N5   *Louis (D1) can you grab that?*

N5   *We're going to do another – another ECG ((Jane interrupts at this point)) because you're complaining of … sorry…?*

At 7.02 pm

Finally when D3 comes to speak to Jane to give her the diagnosis, she also calls her by her non-preferred name:

D3   *So* **Edna** *Mrs ((surname))?*

P   *Yes*

D3   *They did a CT scan of your chest isn't it, to find out if there's a* <u>clot</u> *there?*

P   *There is?*

In the excerpts above, Jane Edna's name is variably used, even changed completely by Doctor Louis (D1) in two instances (*Sweetie*, *Eddie*) yet she persistently tries to have the

nurses, doctors and orderlies address her with the name she prefers. Towards the end of the day (and her stay in the ED), however, she no longer protests or seeks to make changes to the nurses' and doctors' use of her non-preferred name: a capitulation of sorts. Using a patient's name is socially and clinically important: it serves an interpersonal function as a way of relating to the patient as a person, i.e. is quality of care oriented as well as being a safety mechanism to ensure that the nurse or doctor is caring for the correct patient with the appropriate intervention.

Now I examine similar data for Joel's consultation. In Table 14 below, Joel's consultation data confirm that the knowing bricolage process seen above, for Joel, is also a complex undertaking. Table 14 identifies the person, time, what has been passed on or what 'should' be known, processes of documenting or transferring this, and the outcome of these processes as evidenced in action or lack of action. The final column indicates the outcome of the bricolage.

Clinician	Time	What is known about Joel *	Tells/documents *	Outcome
Triage Nurse	11.29am	*Oh, he's getting Fluclox is he?* ((D1 has forgotten that Joel is taking Flucloxacillin. This is despite the fact that earlier when Joel's wife tells him he makes sense of this information by suggesting he knows the import of this)) *Yeah because he can be immunocompromised*	D1 is told Joel is taking Flucloxacillin twice by Joel's wife but does not write this down	D1 forgets what is said to him on two occasions
D1	11.49am	Asks Joel if he is in pain. Learns Joel is only in pain if he moves	This information is in original triage notes: no evidence D1 reads these; in fact we know he hasn't read the notes as he first approaches Joel	D1 fails to hear Joel the first time he asks the question
D1	Midday	Again asks Joel if he is in pain. Learns he only feels pain when he moves as wife ((Jill)) has informed him	No evidence	D1 re-questions Joel 11 minutes after his initial question
N3	12.50pm	Asks Joel if he is in pain. Learns (for the second time) Joel only feels pain if he moves	D1 has been previously told this by N2	Joel is re-questioned about his pain for the 6th time by different clinicians
Carer (Jill) and N2	13.25pm	D1 assumes Joel hasn't had his Oxynorm today	N2 is told; and Joel's wife tells D1 as well at about midday	D1 has not understood that Joel has had his Oxynorm today
D1	14.07pm	Asks Joel and wife (Jill) when the first diagnosis was made for the third time just after 2 pm – in total asks this question on 3 occasions	No evidence N6 tells D1; wife also tells N6	D1 forgets what is said to him on two previous occasions

Table 14: Collective not knowing about Joel

* (Data based on audio-recordings and annotations from field notes)

Information from previous verbal interactions is not (always) recalled and items that are recorded in the notes are not utilised during or just prior to the interactions; once again talk with Joel (or Jill) appears to be the preferred and the quickest way to recheck information.

Joel has come in with an increase in pain in his leg, which he feels predominantly when he moves. Joel's triage notes are not very clear about when he feels pain. They read as follows:

Document 2: Joel's triage notes

Below, I present a series of interactions that Joel has with his nurses and doctors about his pain and mobility. Team knowledge is not accomplished and this leads to frustration on Joel's part.

At 11.29am (on arrival in the ED) the following protocol or rule-governed inquiry takes place between N1 (the triage nurse) and Joel:

At 11.29am

N1   *At the moment when you're lying there what would you give your **pain** out of [10?*
P   *[**No pain***

At 11.40am

At 11.40am just after N2 has assisted moving Joel on to the bed, which has been a painful undertaking, the following protocol or rule-governed inquiry takes place:

N2   *Okay how about that **pain** at the moment honey?*

P   ***None** at all when I don't move*

At 11.42am

N2   *Increased pain mobility ((handing over to N3))*

At 11.49am

Doctor Surita comes to see Joel at 11.49am. Once again, after reading Joel's triage notes and enacting protocol or rule-governed practices, Doctor Surita begins the conversation with a pre-emptive question about Joel's pain:

D1   *Hi you seem to be in excruciating **pain** today?*

P   *Not if I'm (lying) if I'm not <u>moving</u>, **no pain***

Ten minutes later at midday

Towards the end of the initial history taking at midday, Doctor Surita who has just been testing to see if Joel feels pain on mobility, again asks how his pain is. Joel starts to say he has no pain and the wife clarifies that he only feels pain on mobility:

D1   *How bad is your **pain** at the moment?*

P   **No pain.** *[I'm…*

F   *[Lying when he's lying down (he's fine) it's only when he moves*

At 12.50pm

Nurse 3 who has been informed that Joel's pain that is felt only on mobility by Nurse 2 enters the room at 12.50 pm:

N3   *Hello I'm back just going to do your blood pressure again how's your **pain** at the moment?*

P   **No pain**

F   *He won't he'll be alright 'til he moves*

At 12.56pm

Each time the question is asked Joel clarifies that he only felt pain on moving. Just before 1 pm at 12.56 Nurse 3 finishes by saying to him:

N3   *So you don't need **any pain relief now you don't think,** oh, let me know if you do though won't you?*

F   *He will*

P   *I won't …*

F   *'Til they want to sit [him up or …*

P   *[Until you want to – until you want to sit me up or **move** me*

N3   *Yeah*

F   *And then he'll – he'll really go like that it'll be really bad*

At 12.57pm

At 12.57 pm the patient states he feels 'like a bloody goose' because he believes he has been saying all along that he only feels pain when he moves his leg, yet each clinician – following discipline-specific protocols and perpetuating practices –repeatedly asks about his pain. At this point the patient says:

P   *Well you – you just – it's frustrating that you come in here and you – you ah – you report what conditions that you're in **and people must think you're a bloody goose** because and I've been here I don't know probably an hour or so and it's the same **no pain whatsoever** other than when they put me into the bed*

At 13.30pm

N3   *Um yeah so and he's fine if he just lays there and doesn't move but if he moves he gets pain*

P   *Yeah*

N3   *Yeah*

P   *No pain*

N3   *No*

This however was not to be the end of the pain saga and later in the consultation at 13.35 pm, Nurse 6 enters and says:

N6   *Right okay well let's get you filled up and get rid of the **pain***

N3   *Well he's got **none** while he's lying there*

F   *(..) see he's <u>fine</u> 'til he moves…*

In the same way that we saw the variable, but persistent use of Jane Edna's name, the iterative checking of pain in Joel's consultation suggests that social and clinical activities of caring (socially with Jane Edna's name and bio-medically with Joel's pain) override the accuracy of possessed information about either patient.

Patients, nurses, doctors and the ED system 'work around' (Fenwick 2011) the impacts of not knowing and the difficulties not knowing presents. For example, Jane Edna continually seeks to clarify her name with each of the nurses, doctors and orderlies who attend to her. She identifies the lack of knowledge about her name by each of the clinicians, and patiently (re)informs them how she would like to be addressed. However, persistently, each nurse or doctor addresses her inconsistently: Doctor Louis (D1) uses her non-preferred name on several occasions, but he also calls her Jane (her preferred name) on eight other occasions. These eight occasions come between the other times that he uses the non-preferred name. In addition, on one occasion as he leaves Jane Edna, he says: *Alright Eddie.* So in this instance, Doctor Louis (D1) abbreviates, in a familiar fashion, her non-preferred name.

Joel too seeks to participate in the discussion about his pain with each of the nurses, doctors and orderlies who attend to him. He identifies, as does Jane Edna, the lack of knowledge by each of the clinicians of his pain/mobility. Nurse Leah (N6) is told at 1.30pm that Joel feels no pain unless he moves, but as she takes over from Nurse Nelly (N3), her first protocol or rule-governed statement is to question how she can rid Joel of the pain. Unlike Jane Edna, Joel expresses his frustration at the absence of this continuity of so-called possessed knowledge. Joel feels *'a goose'* because he experiences the impact of successive nurses and doctors who fail to get the message about this pain and mobility.

The manner in which doctors and nurses make up for getting Jane Edna's name and Joel's pain wrong suggest that they know these details are important to them. Both for Jane Edna and Joel and for themselves as attending clinicians, these are social and clinical protocols that are essential to reliable, functional processes of engagement, relational knowing and safety. Jane's name represents a quality of care issue (she is seen and addressed as a person)

and safety (nurses and doctors know who she is); and similarly, Joel's pain status is also a quality of care issue (he feels positioned as a *goose* by the multiple questions) and one of safety. Yet as the data indicate in many instances, these protocols appear to function largely as rituals (Evans, Pereira & Parker 2008), while key information is repeatedly forgotten and knowing is (re)constituted.

Based on nurses' and doctors' idiocentric visits to Jane Edna's and Joel's bedsides and the way their doings and saying overlap with each other and duplicate care, it is evident that team knowledge about Jane Edna and Joel, supposedly accomplished through the linear order of the consultation and the transfer of information between carers via handovers and medical notes, is not always accomplished. Nurses and doctors, as individual members of the team, do not know what has gone before in either Jane Edna's or Joel's consultations. Knowledge and knowing cannot be seen as stable, fixed virtues (Yamauchi 2006), and in the dynamic, fast-paced and scattered setting of work in the ED, knowledge and knowing are particularly impermanent and unpredictable. As Czarniawska states knowledge is 'uncertain, fluid and transitory' (2004, p. 786) and in an acute healthcare setting this is even more the case than in other workplace settings.

As knowing is iteratively (re)accomplished in the doing (and/or saying) *in situ*, not knowing is a prominent feature of ED work, embedded in the ED's primary activity, i.e. diagnosis. Diagnosis is an expert practice yet it is underpinned by uncertainty (Singh *et al.* 2013) as is all medical and nursing work.

> Uncertainty creeps into medical practice through every pore. Whether a physician is defining a disease, making a diagnosis, selecting a procedure, observing outcomes, assessing probabilities, assigning preferences, or putting it all together, he (sic) is walking on very slippery terrain (David M. Eddy, Professor of Health, Duke University, USA in Groopman 2007, p. 151).

The 'uncertainty of the expert', is an integral part of medicine, whether stemming from one of three areas identified by Fox (1957): 1) 'incomplete or imperfect mastery of available knowledge'; 2) 'limitations in current medical knowledge' or 3) a combination of both (in Groopman 2007, p. 152). This latter item, according to Groopman, can lead to 'the difficulty of distinguishing between personal ineptitude or limitations of knowledge' (Groopman 2007, p. 152). Both these commentaries locate uncertainty in (a solitary)

practitioner's working/knowing and/or in the complexity of biomedical work. In the ED these aspects of uncertainty are pronounced for a number of reasons.

Firstly, there are multiple objects (medical notes, records, equipment) and people involved with each patient. Nurses' and doctors' work and the bricolage of knowing are closely connected to these objects. Knowing must also be accomplished across time and space and between different people and different disciplines and at ever-increasing speed. Knowing therefore unfolds amid space/time and social/material (including biological) multiplicities. It is these material and relational aspects that render nurses' and doctors' actions (and their knowing) unpredictable and non-linear.

ED work involves actions and activities that respond to the passage of time, negotiations in and around space, rapid changes in health conditions and negotiated interactions between nurses, doctors and patients who are embedded in their own disciplinary paradigms of knowledge and experience. Things unknown and uncertainties alter the actions of nurses and doctors as they (re)produce ED knowledge. The 'dialectic' of what is done, said or understood next occurs as a to-ing and fro-ing between the actions of Doctor Louis (D1) (or Doctor Surita (D1)), the nurses, Jane Edna and/or Joel and feedback from the results of the blood tests, X-rays, CT scans, etc. This 'mangle of practice' focuses on the way that humans and materiality are reciprocally engaged through a dialectic of resistance and accommodation (Pickering 1993, p. 559).

Drawing on Pickering's concepts in relation to Jane Edna and Joel and the organisation of ED care, several episodes of 'resistance' and 'accommodation' emerge. In Jane Edna and Joel's care, it is clear that while the organisation of care is premised on stages of linear organisation, in reality this linearity is thwarted by both the material agency (of blood and urine results, X-rays, CT scans, previous notes, etc.) and human agency (Joel's obstinacy, Jane Edna's insistence on eating a sandwich, a nurse's refusal to pass on information, a doctor's hanging on to the file, Joel's wife Jill and the doctors' actions) as care progresses.

There are negotiations that are held with Jane Edna and Jill, there are the materiality of the successive clinical tests they each undergo, the passing of time and the return of results. There are processes of resistance and accommodation and these must be worked through via the human and material responses and the agency of Doctor Surita (D1) and Doctor Louis (D1). Jane Edna's and Joel's blood tests must be done again; Jane Edna undergoes a terrifying CT scan; Joel's painful leg is moved; and Doctor Louis (D1) examines results of

the three ECG scans. Both junior doctors assemble input from previous GPs, the hostels, previous hospitals, the palliative care team, the experiential knowledge of the patients and their carers and the expert knowledge of their specialists.

Secondly, EDs are training grounds for junior doctors. Much of what they must learn is how to work with things unknown. Junior doctors are not experienced practitioners but they learn to do, while they work, by drawing on 'regimes of familiarity' (Zukas & Kilminster 2012) as they transition from inexperience to experience. They differ from

> experienced practitioner[s] [who] come[ ] to practice equipped not only with skills and capacities to meet each new situation of making, but also with a particular kind of capacity to 'muddle through'. But this 'muddling through' is not just spontaneous, reactive and a matter of raw trial and error. In the skilled practitioner, it is a developed art; what Joseph Schwab (1969) called 'the art of deliberation'. It is the art of thinking through what might be done under these circumstances, in this place, at this time, with these general virtues in mind, and these particular intentions (Kemmis 2005b, p. 404).

6.3.   The bricolage of knowing/not knowing: a contingent space

I present in Table 15 below examples of how knowledge and knowing are mediated, negotiated, lost and altered in the timespace of the ED. Here nurses and doctors are relating, using objects, speaking to each other, enacting disciplinary tasks and working across space and time with their patients and their colleagues in a noisy, high-stress setting. Nurses' and doctors' professional statuses and roles circumscribe knowledge and knowing; knowledge and knowing are also impacted on by noise, mobility, space and time; and not least of all, knowledge and knowing are affected by legibility, memory, miscommunications, idiosyncratic values and misunderstandings – material, temporal, spatial and human elements of knowing/not knowing in the ED.

Legend for the symbols of knowing/not knowing in Table 15 below

Legend	Symbol
Knowledge and knowing are rendered unstable when conflict is involved	
Knowledge and knowing may not always be fixed if notes are illegible	
Knowledge and knowing may be rendered unstable if people forget, or enact authority over others, or have circumscribed roles, or understand/value information idiosyncratically	
Knowledge and knowing may be unstable or if there are misunderstandings	
Knowledge and knowing are not always fixed over time	
Knowledge and knowing are not always fixed or stable in space	
Knowledge and knowing may be displayed unwittingly, i.e. *not knowing*	

No	Knowing/not knowing	Examples
	Mediated by memory	
1	Jane Edna forgets she has brought in her own medication ((puffer))	P *I haven't brought any medication, no…*
	A 92-year old with dementia forgets/does not know that he might be a diabetic	N1 *So you're a diabetic are you?* P *No not a diabetic love.* N1 *Not a diabetic?* P *I don't know whether I am or not* (Consultation data: 06082008)
2	Nurses and doctors forget what they have been told earlier: the potential for generating knowledge or knowing is lost	A nurse or a doctor or a patient forgets what they have been told or what they have heard or what they have said. N4 asks Jane Edna twice within 10 minutes if she has any allergies.
3	Nurses and doctors find it difficult to keep track of where their own or others' actions are up to 	N4 *I['ll] go around check all the inventories all the risk assessment forms (..) those ((N4 preparing to take over the patients of N3))* N3 *Yes do that ((laughs)) they never will be up to date ((laughs)) no we're not too bad at the moment ((background voice)) I don't think I did one on bed 12 do you want handover or do you want?* N4 *Yeah* N3 *Are we doing bed 10?* N4 *(..) walking up there ((says name, distant from microphone))* N3 *((says name)) Oh yeah oh yeah*
	Mediated by knowledge hierarchies: legitimised knowing	
4	The doctor doesn't read the notes the nurse has written or she doesn't take the nurse's or carer's advice: there is idiosyncratic valuing of what has been said or written	D1 *Yeah let's give her some morphine* N2 *Now I have to put a cannula in ((chuckles; as N2 suggested this earlier, but the suggestion was ignored))* D1 *Yes ((chuckles and then N2 chuckles))* N2 *Alright just let me write this down*
5	Doctors, nurses and patients disagree with one another or circumscribe access to particular data: the potential for generating knowledge or knowing is lost 	N2 *Looks like his 'sats' are usually around about 85, or so* D1 *Okay* N2 *Yeah febrile this morning apparently* D1 *Okay* N2 *And more short of breath over the last couple of days* N2 *Oh that's – that – that's my job ((D1 takes file from N2))* D1 *Let me have all that* N2 *Yeah you want to have a read there?* D1 *Can I have a look in this? ((Doctor referring to old notes))* (Consultation data: 16072008)
	A nurse and a doctor fight over a file. 	N6 *Ah [okay* D1 *[Ah, the previous file actually.* N6 *Try and get I'm just trying to [(..) up with all this paper* D1 *[ )* N6 *Paper (..)* N6 *It's a case of snatch anyway ((doctor had snatched the file from N6))* (Consultation data: 16072008)
	A junior doctor complains about the absence of collegiate support from senior clinicians. What she says suggests that there are few opportunities to learn the	*'When I come early in the morning, I look around and I look at the seniors and I choose one person that I can approach because I know that that person doesn't bite, most of the time. So I choose the person and I am happy that day because I'm, you know…'*
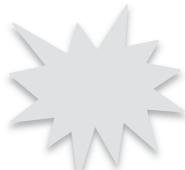
No	Knowing/not knowing	Examples
	local practices that enable junior doctors to make the transitions into expert practitioners, even from people within their own disciplines (Zukas & Kilminster 2012)	(Interview data with Intern: 25022009)
6	Patients, nurses or doctors are not told things, or intentionally do not convey what they know: the potential for generating knowledge or knowing is lost	P *I'm having an X-ray ((says name of orderly)) am I?* O1 *Ah you sure are ((checks papers)) oh no you're having a <u>CT</u> scan* P *A CT scan?* O1 <u>*Angio*</u> P *What's an angio?* O1 *You'll have to ask the radiographers I'm just the messenger*
	A junior medical officer tries to find out if a nurse is looking after a specific patient	D1 *Are you looking after the patient in Bed 10?* N *I'm a float nurse* D1 *Does that mean a 'yes' or a 'no'?* N *That means a 'no'* (Field notes: 17072008)
7	Jill, Joel's wife, has kept a detailed, daily diary of Joel's illness for four years but Doctor Surita (D1) is not interested in the detail she has to offer: what she has to say is not packaged appropriately, it is not legitimised in a particular format	D1 *Since when for the first time he – he had this pain for the first time this leg pain started this leg pain <u>started</u>?* F <u>*Wow*</u>*, way back in* [D1 [*Approximately if you could say two months?*
8	The patient's story is not fully appreciated, or the patient's suggestion is dismissed, or if the nurse says something, the doctor or nurse does not take it seriously	Jane Edna has this problem as she tries to get the aged care nurse (C1) to follow up her query with the thyoroxin in her thyroid gland.
	Mediated by space, time and informational materialities	
9	There are Chinese whispers; the patient or the nurse or doctor changes what they say, or think, either within a second of replying, at other times across the space of a few hours; space and time influence what people experience or remember and what they say can change	D1 *No fever right? ((D1 has asked this before and although wife (F) was present when the previous discussion regarding the fever happened, she has forgotten this and replies))* F *No ((It is N6 who corrects her))*
10	Patient records disappear; there may not be a 'fixed' record of a patient's care	F *They lost a whole lot of scans at Hospital A* [P [*Scans at Hospital A* F *They think that med students stole them.*
11	Details and records are in different places: the potential for generating knowledge or knowing is lost	D1 *Okay, that's good. So we'll just wait for the results of the blood exams and I'm waiting for old notes to compare your old ECG … with your new ECG*
	Doctors, nurses, wards men and clerical staff are constantly looking for people, equipment and data in acute areas of the ED.	N *Has anyone seen the ultrasound machine?* D *Where has patient 10 gone?* D *Somebody ought to answer that 'phone. Where is our Katie? ((Clerical assistant))* N *Did you do an Admission for X?* O *I've come to collect Patient 11. Does anyone know where he's gone?* CC *Has anyone taken the notes I left here?* D *Now where's Simona? Have you seen Simona? She had an elbow she wanted me to look at* (Field notes: 10102009)

No	Knowing/not knowing	Examples
12	Patient or care details are out of date: doctors and nurses catch up with details *ex post facto* 12 9 3 6	By the time the doctor hears about something, the patient's condition has changed, or the notes are assumed to be current, but are out of date. In one case, an HIV aids patient with shingles is directed to the waiting room for 1.5 hours even though he presents with a special letter from his GP telling the triage nurse he is highly infectious. Later the triage nurse moves him into an isolation room. (Field notes and consultation data: 16072008)
13	A nurse leaves a urine sample on a chair: it is not used to resource knowing	During Jane Edna's consultation a urine sample is left on a chair and forgotten there.
	Mediated by communication breakdowns and misunderstandings	
14	A patient misunderstands (mishears) a nurse and misinterprets what she has said: one thing is said, another thing is heard	P *They're going to kick me out?* N *No we think you've got gout* (Field notes: conversation between a doctor and a patient: 01062006)
15	Jane Edna tells the researcher once the doctor has left the bedside space that she doesn't understand what he's saying	R *Did you not understand that?* P *I couldn't follow him no* R *Right* P *I wonder why I can't understand him? ((loud noise nearby))* R *He has – he has a slight accent.* P *He has, yes I'm glad you said that, I thought possibly it was me* R *No -no he does – he has a slight accent* P *I find it very hard to um follow him* R *Yes I think it's fine to ask him to repeat* P *I kept asking him* R *Yeah, we kept going around in [circles* P *[Yes I know I didn't know whether I was going out of my mind I think I will before long if they don't do something*
16	A senior doctor, a patient and his wife take 17 exchanges to clarify a medication regimen, which is already fully documented by the first nurse who settles the patient prior to this exchange	D2 *How much dose did you have last – in the last…?* P *Four three times a day* D2 *400 milligrams or?* P *No um 600* P *Yeah four ((patient makes an error)) five 150 tablets* D2 *Ah okay* P *150 gram tablets* D2 *And 600 milligrams the whole of the day?* P *Yeah* D2 *[So one?* P *[Ah 600 three times a day* D2 *Three times a day, okay* F *[Eighteen hundred* P *[Yeah so I get a – I get a (..)* *[* D2 *[Eighteen hundred* P *Yeah, 10-day cycle is 120 tablets* (Consultation data: 2432009)
17	Nurses, doctors and patients are told something, but they don't hear it: the potential for generating knowledge or knowing is lost	D1 and N2 are both present when the ambulance officer tells D1 what medications Jane Edna has been given. They both forget what they have just been told.
18	Understandings remain unprocessed	Someone is told or given something but they do not use it.
19	Nurses and doctors find certain details of	

No	Knowing/not knowing	Examples
	greater interest than others. 'News' about patients in the resuscitation room, or patients with sexually transmitted diseases travels quickly in the ED as does news of a really serious case (Field notes: discussion with Junior Registrar: 23022009)	
20	Writing is unintelligible, e.g. a patient or clinician doesn't make sense: the potential for generating knowledge or knowing is lost.	P I heard what she said but I don't know _what_ she said (Consultation data: 26042006)
	Clinicians and patients misunderstand each other. In Joel's consultation, Jill, Joel's wife says the following about her communication with Doctor Surita (D1)	F I'm finding it hard for him to understand what I'm trying to say R Mm P He seems to be repeating things R Mm P I'm finding difficult to express just because I know it in my [head exactly R [Yeah, yeah. F And I think I'm saying it pretty well R Yeah F But he's not taking it in what I'm [saying. R [Yeah, I'm picking that up [so, yeah F [I'm finding it really difficult for him understanding what I'm trying to say.
	Mediated in transfer between people	
21	Nurses and doctors tell the wrong person what needs doing: the potential for generating knowledge or knowing is lost	There is discontinuity in the make up of the team resulting from institutional structures and schedules. A relief nurse is asked to give the medication rather than the staff nurse who happens to be on a tea break.
22	Nurses and doctors (and patients) construct things differently when speaking to different people	See example with Jane Edna and 'Anginine handover.
23	Nurses and doctors omit some details: patients' notes or results go missing or nurses and doctors don't get the full picture of a patient's identity or health status	Only some of the details about patients are transferred (or remembered), see Joel's pain saga and Jane Edna's name saga.
24	Writing is illegible, or idiosyncratically constructed and reworked: knowledge is not fixed or stable: what is written down is not necessarily 'true' and knowing needs to be reconstituted all the time	_'No, I mean, this occurs frequently that notes are so poorly written that they're of no help at all. Because we often try and get an idea looking back to the previous notes, you know, what they came in with last time, that sort of stuff. Or, or even handing over from shift to shift, so the night resident hands over and we go look and often they're so useless you have to go back and take your notes again. And that may be for different reasons: it may be because they're completely illegible. Maybe because they're so short. We were taught in medical school a particular way to write notes; most people follow that. Some people choose not to follow that and that makes it very difficult. Some people are very scanty with their notes, they'll take a big history and have a lot more information and if you ask them the question they'll tell you but they don't write them down. And so it becomes very difficult. And sometimes you've got no idea from the notes what's actually gone on. And I think other people write their notes, not that they're sort of lying but they want_

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No	Knowing/not knowing	Examples
		their notes to fit a picture so actually they'll write something that's not quite actually as it happened. And I think that the notes should be a true representation of what happened. Even though it's never true because things get lost with every, every step of communication, but I think they should be aiming to be a true representation of what happened. If you want to then sum it up into something that fits a picture, that's fine but you need, you need to (have a record)' (Interview data: ED senior registrar 08072008)
Mediated by perceptions and/or presumptions		
25	People make the wrong assumptions; the wrong instructions or answers are given, or assumed; there is misinformation; the potential for generating knowledge or knowing is lost	*N4 We're going to have to do a cardiograph and check your heart* *N3 She already had an ECG so it's just cardiac monitoring ((N4 gets this wrong and instead she just needs to do monitoring))* *N2 What are we – what are we looking after you fallen (over) or what? ((Patient has cancer of the leg and N2 makes a predictive assumption that turns out to be incorrect))*
Mediated by not knowing		
26	A junior doctor displays insufficient medical knowledge: but he does not know this: this is not knowing not knowing)	One junior doctor believes a patient is a CO_2 retainer but he's not as the old notes have a 'bicarb 'reading that indicates he is not. The senior doctor corrects the junior on this after the patient has been in the ED for 4 hours and has had his oxygen reduced on the incorrect assumption (by the junior doctor) that he was a retainer. N2 and N5 query whether the patient is a retainer throughout the consultation. (Consultation data: 16072008)

Table 15: Knowing/not knowing in the timespace of the ED

Knowing/not knowing at Jane Edna's and Joel's bedsides

The examples from Table 15 above illustrate how working, learning and knowing interconnect with each other. What one nurse or doctor sees as important to know might be contested, misunderstood, challenged, ignored, altered, picked up, transferred – or not – understood and acted on – or not – by other members of the team. In addition, nurses and doctors forget (Table 15 examples 1, 2 and 3), confirming findings from recent studies that indicate how unreliable memory is (Paterson, Kemp & McIntyre 2011; Talbot & Bleetman 2007; Welch *et al.* 2013) especially when people attend to a number of things consecutively and/or in fast-paced settings. Also, patients change what they say on different occasions (example 1); clinicians (or patients) can challenge what they are told (Table 15 example 5); there are misunderstandings or miscommunications (Table 15 examples 14, 15, 16 and 17); details change as they travel between clinicians and/or between clinicians and patients (Table 15 example 9); codified knowledge (notes, X-rays) go missing (Table 15 example

10); and finally a junior doctor's knowledge is different from his senior doctor's knowledge on a patient's CO_2 levels (Table 15 example 26). The last example illustrates not knowing *not knowing*.

Yamauchi identifies that 'knowing in action' involves working 'with things unknown' (Yamauchi 2006, p. 8). Below I illustrate how nurses and doctors work with things unknown.

6.4.   Working with things unknown

In the extracts below from Jane Edna's consultation, Nurse Bella (N2) and Doctor Louis (D1) have been given details but they do not use/remember what has been said. Yet they know how to activate their knowing, as they work with things unknown. The extracts are significant for two reasons. Firstly, they illustrate the vagaries of what is passed on in a handover as an ambulance officer constructs different components of knowledge about Jane Edna. The ambulance officer packages what he says differently for three different groups of people: to N1 (triage nurse), to Nurse Bella (N2), and to both Nurse Bella and Doctor Louis (D1) together. Secondly, the extracts also illustrate socio-cultural patterns of knowing that prevail as Nurse Bella (N2) and Doctor Louis (D1) work. Doctor Louis (D1) takes the knowing lead.

On arrival at the ED, the ambulance officers (A1) who bring Jane Edna in hand over to the triage nurse (N1):

At 10.15am

A1   Now I've given her aspirin and <u>two</u> Anginine ah she still feels as though she's got some discomfort in her chest (..) ah she's taken about <u>three</u> sprays of her nitrolingual spray over that period of time but we're not exactly sure <u>when</u> or when the last one was so <u>last</u> BP I've taken was 120 that was after the <u>first</u> Anginine I haven't taken one after the second one.

Beyond the density of what he says, involving – *aspirin… Anginine… nitrolingual sprays… 120, after the first Anginine… last BP*, the exactness (accuracy) of this is poor *some discomfort… about three… that period of time… not exactly sure.*

Shortly afterwards, A1 hands over to Nurse 2 at 10.25am in the resuscitation room and she varies what she has told N1, by omitting some details:

A1   Now I'm not she's had about three sprays at…

A1 does not mention the aspirin or the Anginine, and again hedges the number of sprays. Shortly after this statement, Doctor Louis (D1) arrives in the room and moments later A1 tells D1 while Nurse Bella (N2) is present – although she is busy with Jane Edna – about the medication she has given Jane Edna. This is similar to what A1 tells the triage nurse but she omits the detail about the nitrolingual spray that she told the triage nurse (N1):

Continuing the conversation started with N2 – A1 giving different details

A1   It's just uncomfortable ((referring to Jane Edna's pain)) now I've given her an aspirin and two Anginine

D1   Mm mm

A1   Her blood pressure initially was <u>140</u>

D1   Mm mm

D1   Mmm

A1   Post the first Anginine it's 120 and I haven't taken another one.

Everything is documented in the ambulance officer's and triage notes, which D1 and N2 use shortly hereafter, although the accuracy of what is written is not verifiable (by me, the researcher).

What is said or written about Jane Edna is at best inconsistent and vague, and at worst, inaccurate. A1 also tells Doctor Louis (D1) that Jane Edna has a history of ischaemic heart disease, but she does not tell this to either N1 or Nurse Bella (N2). This aspect of Jane Edna's previous history is not documented in Jane Edna's triage notes, but it may explain the doctor's investigative trajectory later and his reluctance to commit to a diagnosis (proposed by N6) before he does a final ECG.

Although Nurse Bella (N2) has been told about Jane Edna and is present as the ambulance officer (A1) gives Doctor Louis (D1) a handover too, she and Doctor Louis (D1) both need to reconstitute the detail of what they need to know shortly thereafter. At about 10.42am neither Nurse Bella (N2) nor Doctor Louis (D1) remembers exactly what has been said. Doctor Louis (D1) wants to check how much medication Jane Edna has had and asks Nurse Bella (N2) how much *we have given her*. This use of 'we' most likely indicates 'the system' rather than what they themselves have given Jane Edna.

Nurse Bella (N2) tries to remember what Jane Edna has had even though she was present when Doctor Louis (D1) was told by A1. It is only in this moment – just prior to action –

when they need to give Jane Edna *further* medication that they seek to confirm what Jane Edna has already had. Both Nurse Bella (N2) and Doctor Louis (D1) struggle to remember what was said to them, although Nurse Bella (N2) does recall *three* sprays as a certainty – even though A1 said it was *about three sprays*. A1 did not mention the Anginine or the aspirin directly to Nurse Bella (N2), but she appears to completely forget hearing about the aspirin and the Anginine. Doctor Louis (D1) does not recall the detail of the Anginine but as he is poised to act, he reconstitutes what he needs to know:

At 10.42am

D1   *How much Anginine did we give her?*

N2   *She's had three of that ((pointing to nitrolingual spray))*

D1   *And that's um…?*

N2   *Yeah*

D1   *That's expired so this…?*

N2   *They didn't give her any more I don't think ((reads notes)) – ah yes they did – no they didn't – they gave her two and one aspirin.*

In this way he works with the codified knowledge about Jane Edna, the materialities of care, i.e. in practising.

In another example, Doctor Louis (D1) is told by A1 that Jane Edna has macular degeneration (and is almost blind), but he does not recall this soon after he is told. He does not know that he does not know, but he does apologise to Jane Edna when corrected by her:

D1   *Which puffer the red one, that one?*

P   *It's a puffer I can't I'm blind*

D1   *This one?*

P   *I'm blind*

D1   *Oh you're blind I'm sorry*

He soon forgets and later Doctor Louis (D1) asks Jane Edna to sign a consent form for her CT scan. He says: *Okay. Um – I just need you to sign here.* Jane Edna replies: *Well you'll have to point – where I sign.* Doctor Louis (D1) shows her: *There.* Following the signing, Jane Edna says: *I don't know what that will be like (referring to her signature).* Doctor Louis (D1) forgets on two occasions about Jane Edna's blindness even though he had been previously told about this. Once again he apologises to Jane Edna.

There are two separate issues I explore here. One is that individual nurses and doctors do not always recall details they themselves have known or have been told but they know how to proceed and to enact remedial social and or clinical work. The other issue I explore is that other members of the clinical team frequently do not know patient details, nor do they always know what others have done. They must come to terms with these materialities as they work because this not knowing is more consequential and impacts on patients, both in terms of their safety and the quality of their experiences. For example, other nurses and doctors persistently do not know about Jane Edna's blindness. This is a thread that traverses her consultation. Nurse Peter (N5) later makes the same mistake about Jane Edna's poor eyesight:

N5   *Ah well I don't want to let you walk on the floor with those stockings on you'll have a slip*

P   *That's true*

N5   *Are they the little blue coloured shoes?*

P   *I wouldn't know the colour I'm blind*

Nurse Cate (N4), who follows Nurse Peter (N5), makes a similar mistake:

P   *You'll have to open it for me darling I can't see to [open it*

N4   *[You can't open it?*

Nurse Cate (N4) has forgotten an earlier conversation with Jane Edna who said to Nurse Cate (N4) while she was doing the admission, not without some sarcasm:

N4   *Okay and you're not wearing hearing aids that I can see?*

P   *No I might be blind but I'm not deaf.*

In this latter example Jane Edna succeeds in stating her dissatisfaction with the team's disconnected knowledge: she too has learned to respond to things unknown, the bricolaged nature of care organisations.

Working with things unknown is particularly challenging for junior doctors. In Jane Edna's and Joel's consultations Doctor Surita (D1) and Doctor Louis (D1) struggle to memorise or effectively draw on their newly-acquired scientific (*in vacuo)* knowledge as they practise. Each has difficulty resourcing their knowing from more experienced nurses and even from patients. Joel's consultation is particularly challenging for Doctor Surita (D1) as he has to draw on knowledge about Joel that is fragmented beyond the here and now. For example, in the past five years Joel has been treated in three hospitals, has seen four doctors (two specialists and two GPs), has one palliative care team and has undergone multiple X-rays

and CT scans. Joel is also taking or has taken numerous medications. Joel's wife, Jill, has these medications listed and knows them all by name and by their dosage – she also uses pharmaceutical terminology, e.g. *BD* (twice a day). Jill's detailed knowledge confuses Doctor Surita (D1); he is not sure whether Joel has had his Oxynorm today or not; at various times he is confused about *what* medication Joel is taking, for example, Flucloxacillin, or *whether* he is taking Flucloxacillin at all (see footnote about Joel's medications).[24] Doctor Surita (D1) learns to work with things unknown through safety protocols that facilitate a space for Joel's medication to be checked and documented several times:

D1   *I need to receive the papers from these two hospitals um yeah and how much* Oxycontin *he is getting at the moment? ((D1 returns this time at 13.25 pm. Joel's wife Jill (F) has told D1 this before))*

F   *100 milligrams morning and night ((D1 writing down the what is said this time this time))*

D1   Oxycontin *((writing))*

F   *Yeah I give him an 80 and a 20 together and Oxynorm 30 as a breakthrough*

D1   *Okay and 100 milligram? ((writing))*

F   *Yes he's had the morning dose*

D1   *He didn't get the* Oxynorm *today right? ((D1 has already been told this))*

F   *He's had it today yes he had it just um when we …*

The inexperience of Doctor Surita (D1) is evident because he does not follow proper procedures in the consultation: he attends to Joel before he has fully logged himself onto the computer system. This means he finds out very little about Joel before he speaks to him. Then he resists what Jill (Joel's wife) has to say to him and draws minimally on Jill's diarised notes: he does not yet know (as an experienced senior doctor might) the extent to which he can use Jill to resource his knowing. Doctor Surita (D1) does engage with Jill, but does not fully acknowledge what she knows. Doctor Surita (D1) is not habituated to working *with* Jill as a long time carer of Joel, as he muddles through the consultation. Instead he works *against* her knowledge. He experiences not knowing *not knowing* as he has not yet learned that knowing what to do, say and how to be as an emergency doctor or nurse must include working with Jill and her knowledge and that of the more experienced senior nurses.

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[24] Joel is on Flucloxacllin, Oxycontin, Oxynorm, Movicol, Senna, Dexametasone, Plexane, Clexhane, Nocte, Indep, Somac, Avastan, Interferon, Hexane, Sugent, Diclox Betazessamad (RAD001 which Jill explains is Sertacan, and which is used in AIDS and transplants – it is a rejection type drug.

Rather he resolves his not knowing by taking several fragmented histories from Joel (Doctor Surita (D1) does not take notes at his first history taking or in subsequent discussions, but finally he does write down what he hears). He does not use Nurse Leah's (N6) history or Nurse Nelly's (N3) history, each of whom knows something about what has happened to Joel. Jill has a list of all Joel's medications documented in a diary. This list is taken down in the nurse's notes and Doctor Surita (D1) writes them down again. Following this, Joel's wife and Doctor Surita (D1) discuss Joel's dosage for Oxycontin twice: *And how much Oxycontin he is getting at the moment*; they also discuss the fact that he has had it increased on two occasions and twice they discuss the fact that Joel has had Oxynorm today: *He's had it today, yes, he had it just, um, when we…* Doctor Surita (D1) is also told three times that Joel is on Flucloxacillin. Doctor Surita (D1) completely forgets that he has been told this twice already; Jill discusses this twice with Nurse Leah (N6).

In addition, Doctor Surita (D1) asks Joel and Jill several times about when (and where) Joel was first diagnosed with cancer; when the pain in his groin first started; where the cancer's primary site was and to where it has metastasised; what has been worse in the past few days and what medication he is/was taking. Doctor Surita (D1) also asks twice about when the swelling has started and does not hear Jill when she tells him the first time that the palliative care team comes to visit them once a week. Jill also confuses Doctor Surita (D1) as she suddenly tells him things when he has not asked for any further details.

Both junior doctors, Doctor Surita (D1) and Doctor Louis (D1), frequently display not only incomplete or imperfect mastery of available knowledge – possessed knowledge but incomplete mastery of knowing how to work with their patients and with their colleagues. When examining the tenor of the exchanges between the senior nurses and Doctor Surita (D1) and Doctor Louis (D1) in the two case studies, there may be some clues as to why these junior doctors might be reluctant to resource their knowing from nurses. For example, in the visits to Jane Edna on only two occasions during the consultation does Doctor Surita (D1) asks Nurse Nelly (N3)) whether *Joel has cancer* before he begins talking to Joel. Nurse Nelly (N3) is not very helpful. Later Doctor Surita (D1) asks a general question about Joel's fever to which Nurse Leah (N6) initially does not respond – although after cutting across him with a question to Jill, she does finally answer.

The analysis above suggests that knowing is fragile and finding out things is hard fought. In Chapter Five the data examined how nurses and doctors contest details across the

disciplinary divide as well as how patients (carers), nurses and doctors contest details. What can be known and by whom, is variably legitimised. Codified knowledge (patient notes, X-rays, blood results, etc.) is misplaced in the space, time and materiality of the ED and there are misunderstandings and miscommunications. Yet the performances of the actions of nurses and doctors unfold as care happens: the activity of knowing goes on in the absence of fixed and stable knowledge.

The data above, the name and pain sagas of Jane Edna and Joel (collective not knowing); individual lapses of memory, the developing practice of junior doctors (individual not knowing); plus the impact of mobile, dispersed knowledge in the ED and the non-linear unfolding of diagnoses, suggest that knowing/not knowing are intricately connected, irrespective of whether nurses or doctors have communicated with each other or not and irrespective of whether individual nurses and doctors have known something before themselves or not. The materialities of illness, space, time and codified knowledge render knowing and not knowing as paradoxically coexisting.

6.5. Knowing/not knowing and the current model of ED care

Chapter Two addressed how the safety and quality of patient experiences in ED are conventionally premised on the secure transmission and stability of what are still largely understood as mutually agreed and cognitively based items of information. Improvements reside in improving ED communication (and information transfer) through mapping the process, identifying risks before they happen, having 'a shared view of the problem' and communicating effectively (Redfern, Brown & Vincent 2009a, p. 657). While these are all desirable ways to address some issues of quality and safety in EDs as discussed, these efforts continue to situate solutions to information transfer in a linear, predictable model of work premised on shared understandings, manageable objects, neutral professional doings, sayings and beings and the secure transmission of information through protocol-based handovers.

The findings above shift knowing from the realm and control of nurses and doctors as discrete communicators, and challenge current understandings of how information is transferred in the ED consultation. Instead, patient and collegiate details are worked with in practice through continual renewal and reconstituting. Yet patient safety narratives continue to rely heavily on improving handovers, seeing them as a safety procedure in the

ED. This is despite the fact that a casual observer of this practice in any ED would notice the loose spatial configuration of people participating in them. Nurses and doctors intermittently enter and leave the auditory space of the handover, underscoring the ritualistic nature of the activity rather than its intended functionality as an information exchange process (although in smaller handovers this might be different). Attention is paid to the speaker, but in the noise and chaos of the ED and the data above, it is evident that not everything is heard, remembered, shared or valued in the same way by different people. The ED model of care (and those in other medical settings) places so much reliance on the practice of handover, which remains primarily premised on memory (with prompts such as the patient's notes, etc.). Based on the data above it is evident that this reliance ignores the bricolaged basis of *in situ* practices.

In Chapter Four I began to explore the possibility that information and information transfer, while primary to ED care, are accessed and worked with, not in primary ways as straightforward linear processes (in handovers, for example), but in secondary (even underground) ways. As nurses and doctors need to know and act, they deal with the materialities of care, codified patient knowledge, in practice through individual, collective and iterative sayings and doings that layer objects, people, space and time through activity. They work with what they need to know recursively, their knowing is not merely cognitive, knowing is embodied, ongoing, enacted collectively: nurses and doctors reconstitute their knowing in multiple visits and duplicated questions; they check again; they pop their heads in through curtains to see patients; they place stickers on their knees and abbreviated notes in their pockets to remind them of tasks remaining and knowing that is incomplete – things they must finish later, or in another place.

While knowing/not knowing could be seen as enmeshed in the social, epistemological and material arrangements of all organisational settings, the ED's model of care, and the nature of healthcare practice in particular, further disrupt the collective enacting and doing of knowledge. Yet nurses and doctors do manage to know a lot in practice.

6.6.   Shifting from knowledge to knowing

From a practice theory perspective knowledge is seen as being enacted in the flow of praxis (Schatzki, 1996, p. 13 in Shove, Pantzar & Watson 2012), not necessarily in fixed records or practitioners' minds. Knowledge is (re)produced through praxis in which multiple

practitioners, objects, language, space and time combine in regularised actions and activities that make up the practices of the ED. Neither knowledge nor knowing are fixed, yet ongoing activity is the 'action-net [that sustains] knowing-in-action' (Gherardi 2009, p. 352).

This means that it is the activities of interacting, navigating across space and time with others and patients that become the central focus of a practice-based approach, i.e. knowledge is understood as knowing. If doing knowledge is seen as activity that is relational and situated, then what is known about Jane Edna as she is cared for becomes no longer solely a cognitive, fixed possession. Knowing (about Jane Edna and Joel) can be understood as an ongoing accomplishment (Orlikowski 2002). And while communicating is a central activity, this is not all that is required for knowing as outlined in Chapter Five.

From the analysis above I conclude that knowing/not knowing, collective and individual, unfold within the current model of care in ways that are routine (ritualised), iterative, often disconnected (from previous knowledge) and mangled, i.e. it is not linear or neat.

My ethnographic observations captured the activity of reconstituting knowing at the bedside, not always what immediately preceded this action (although the example with Doctor Louis (D1) and Nurse Bella (N2) discussing the Anginine is one such instance). A limitation of the study is that in most instances I can only speculate how each nurse or doctor reconstitutes his or her knowing about patients at the bedside *immediately prior* to engaging with them. They either refresh their memory of a patient's name utilising the sticker on their medical notes as a prompt for what to call them in their interactions each time they approach them; or they variably forget or remember their name; or the detail and the care customisation are not important; or the desire for a preferred name is not handed over in the handover sessions, or if it is, it is not remembered. Only occasionally did I observe nurses and doctors reading the notes before they engaged with a patient or as they were about to enact care for the patient.

Most often nurses and doctors resource their knowing about patients in idiocentric visits to patients' bedsides and continually renew what they need to know in the moment through talk, and sometimes by reading there and then. An example of this is when Nurse Cate (N4) thinks Jane Edna requires another ECG (which she does not) and then Nurse Cate (N4) thinks that maybe Jane Edna needs a blood test but discovers by reading the notes that Jane Edna has already had her blood taken: *And they didn't do any blood or anything did*

they? Oh they have ((reading the notes)). Nurse Noreen (N3) and Nurse Cate (N4) in this moment make another mistake because when Nurse Noreen (N3) answers Nurse Cate (N4) she infers that because Jane Edna had been in the 'resusc' she is *pretty sure* they would have done bloods: *Um, I'm pretty sure they (…) because she was in 'resusc' – so…* Nurse Noreen (N3) does not know that Jane Edna was in 'resusc' because there was no other place to put her; yet makes an assumption about her diagnostic tests based on where Jane Edna was located. Somehow she has established that Jane Edna was in 'resusc' and assumes that they have done the bloods: assumptions that are wrong. This is not knowing *not knowing.*

The idiocentric visits and what transpires there in practice – iterations, duplications, constituting and reconstituting of knowledge with little evidence of reliance on cognitively retained, communicated or documented patient details or collegiate actions – suggest that knowing (patient and treatment details) is tenuous.

The data provide a deeper understanding of how muddling through defines ED work and has implications for safety. While knowledge (or information) as object (codified patient knowledge) constitutes a substantial part of ED work, rechecking, reclarifying, mis-remembering, refreshing, predominate as actions unfold: and it is in and through these iterative activities that safety is attempted to be enacted.

In viewing knowledge as an unfolding activity, I have come to understand action as a key part of the way the ED works: knowing is indeterminate and unpredictable. The way knowing unfolds is neither a fluid, nor a fixed process. Multiple activities and instances of knowing and not knowing perturb the linear order of care. I illustrate this point by reproducing below example 3 from Table 15. In this example, nurses and doctors find it difficult to keep track of where their own or others' actions are up to (see also Finn & Waring 2006) and they are aware of this. The complexity and pace of work suggests that documentation lags behind action and sequencing of tasks is not fixed:

N4	*I('ll)go around check all the inventories all the risk assessment forms (..) those ((N4 preparing to take over the patients of N3))*
N3	*Yes do that ((laughs)) they never will be up to date ((laughs)) no we're not too bad at the moment ((background voice)) I don't think I did one on bed 12, do you want handover or do you want…?*
N4	*Yeah*
N3	*Are we doing bed 10?*
N4	*(..) walking up there ((says name, distant from microphone))*
N3	*((says name)) Oh yeah oh yeah...*

Nurse 3 knows that the risk assessment forms *never will be up to date*. She does not remember if she has completed a form for Bed 12. Her uncertainty extends to her subsequent actions – whether or not Nurse 4 wants a handover, wants something else, or whether they should do another bed.

Although precise details are not always to hand, each nurse or doctor comes to know bodily through seeing (or can reasonably expect) that someone has triaged Jane Edna; some have even read the triage notes; they understand that another nurse has settled Jane Edna; they find out that someone has taken Jane Edna's temperature and written this down and they also read that she has been given medication as ordered, but they can rarely know this for sure. The same applies to their individual actions. But in having these expectations, nurses and doctors frequently display not knowing *not knowing*. This means they do not know what they, in a way, cannot know.

Even though nurses and doctors might not have absolute surety about what they've done or where they are up to, Nurse 3's and Nurse 4's comments above point to an understanding of a sequence of action and activity: they know how to proceed to do the next thing, either by interrogating themselves or each other; knowing in action involves working with 'things unknown' (Yamauchi 2006, p. 8).

The consultation summaries and the disconnected communication scenarios above reveal that the staged organisation of care is challenged by the *in situ* complexity of actions (knowledge as activity), the number of attending clinicians, the different roles enacted by nurses and doctors in caring for Jane Edna and Joel, and the space and time over which their consultations unfold. Therefore, what happens in practice subverts the intended linear, staged order of care in the ED presented in Chapter Four.

The data suggest that nurses and doctors reconstitute their knowing as a routine undertaking. While the number of visits to patients' bedsides is accentuated by space and time in the ED and the materiality of their work, which requires them to work with patients and treatment details, the reconstituting is mundane activity. The examples illustrate how each nurse and doctor (re)engages with what they need to know, not as possession (cognitively remembering what has gone before or what they have been told) but through praxis, i.e. through iterative doings and sayings.

This situates team (and individual) communication and knowing in a complex paradigm of practice that goes beyond straightforward information transfer executed through handover

activities, concomitant protocols and cognitive models of memory/working that reify *in vacuo* possessed knowledge. Protocols and policies, while utilised in practice to some extent, as I discuss in Chapter Seven, are glossed over in this multi-layered and multi-discursive reality.

This reality contrasts with one ED Director's views below as she communicates the prevailing healthcare paradigm of knowledge as possession (and control), even though she acknowledges that doing knowledge is a collective and a situated accomplishment:

> It's a team sort of approach to knowledge, gathering knowledge, sharing and also knowledge communicating. The real information sits with the primary doctor and nurse until the patient leaves ED and then it becomes the chart and it becomes the health record. (Interview with ED Director: 27111007)

For this ED Director, knowledge involves primarily cognitive sharing of information. Here the 'real information' is stable, cognitively stored with the doctor and the nurse and becomes fixed as the patient's 'health record' once the patient leaves the ED.

6.7.   Concluding comments to Chapter Six

In Chapter Six I explored the unfolding of the performances of nurses' and doctors' activities and actions in the ED. I traced how nurses' and doctors' knowing is enacted in iterative, non-linear, disconnected and 'mangled' (Pickering 1993) ways, and involves not knowing as they work in the ED's 'system of fragmented knowledge' (Bruni, Gherardi & Parolin 2007) over time and in space. I explored what this meant for individual and team knowledge and knowing as care happens.

I presented data on how patient and care details could be idiosyncratically understood, valued, negotiated, misplaced, forgotten (Talbot & Bleetman 2007) by members of the team and or the patients and/or altered by multiple nurses and doctors.

I identified two things: 1) not knowing is a prominent feature of ED work for the team and for individual nurses and doctors; and 2) knowing is a complex phenomenon, requiring continual renewal through activity: it is an ongoing accomplishment – 'constituted and reconstituted every day [and in every action] in practice' (Orlikowski 2002, p. 269).

I examined these findings in the light of the ED's model of care, premised on healthcare's view of knowledge (Nicolini *et al.* 2008) and I proposed, based on the data, that knowledge is located in praxis that is collectively and individually sustained rather than located in

information-transfer models of work. In doing this, nurses and doctors muddle through, sometimes taking advantage of the opportunity to check details, at other times not knowing details.

I identified that ED work is precarious. The complexity of work involves boundary-riding activities and persistent ambiguities that will increasingly challenge the safety of patients and the ability for nurses and doctors to cope in this system.

In Chapter Seven, based on the precariousness and complexity of ED work, I explore a meta-disciplinary and institutional framework of practices that I propose nurses and doctors draw on to enact safe care.

Chapter Seven – Knowing in practice

Purpose and flow of this chapter

In Chapter Seven I present a new conceptualisation of how nurses and doctors know in practice in EDs. I situate their doings, sayings and beings in a meta-disciplinary and institutional practice framework – dimensions of ED work that I have categorised heuristically as 1) proximal; 2) prefigured participatory; 3) predictive or pre-emptive; and finally, 4) protocol or rule-governed. I plot these practices in two groupings: one that takes account of the diasomatic (body-to-body) nature of medical and nursing work and one that considers the prescient or predictive nature of medical and nursing work in the ED.

This practice framework is presented as a heuristic – descriptive and explanatory on the one hand however always embedded within working with knowing and not knowing at the same time explored through the earlier chapters. Through these practices, I argue, nurses and doctors finesse their knowing at the bedside in moments of discovery (and confirmation) about the patient's condition or previously experienced care: they 'practise knowing' (Manidis & Scheeres 2013). '[K]nowing in practice – focuses directly on the process of creating and using knowledge while organizing' (Gherardi 2006, p. xx [roman numeral]).

I explore the meta-disciplinary and institutional framework that encapsulates what it means to shift from a stance in which doctors and nurses communicate (fixed) knowledge to one in which doctors and nurses continually reconstitute their knowing in ED work. The meta-framework provides a way of understanding ED work based on what nurses and doctors *actually* do and say to manage the disciplinary and institutional exigencies of their work setting, rather than one based on the potentiality of their communicative abilities located in outdated notions of knowledge (transfer systems). Knowing – and communicating – instead are recognised as spatio-temporal dynamic and emergent phenomena collectively distributed among practitioners, technologies and objects.

However, the practices as described call into question the safety and quality of patient experiences 'bundled' as they are with the ED's 'material arrangements' (Schatzki 2006), and set up in ways that maintain the vested interests of medicine in particular. The

framework raises questions about the sustainability of the current model of ED care if knowing is so fragmented in one space and needs to be recursively constituted.

7.1. The concept of practising knowing

Chapters Four, Five and Six have illustrated that ED work embeds a multiplicity of accounts and understandings; knowing requires a reparative bricolage of catch up, revision and renewal; knowing also involves trade-offs (checking on pain again at the risk of frustrating the patient), risk-taking and boundary-riding activities. The latter include for example, functionality-dysfunctionality (something should have been done (said) and it wasn't done (said)); safety-unsafety (making assumptions about what is wrong); knowing-not knowing; teamwork-absence thereof; even care-busy-ness. All this means working in a context of simultaneous knowing and not knowing.

The meta-disciplinary and institutional framework seeks to provide some understanding of the complexity of the multiple knowledges that underpin nurses' and doctors' practices and incidentally, but not unrelatedly, how clinicians use (or don't use) information that already exists about patients as they engage with them to inform their actions (Savolainen 2009). The multi-disciplinary and institutional framework of practices illustrates how nurses and doctors have a repertoire of practices that they draw on, not necessarily in consummate ways in a particular moment and context, but in muddling through.

So how do nurses and doctors know in practice in the current model of care? How do they manage the non-fixed nature of knowledge and knowing, the fragile networks, the institutional arrangements such as the ebb and flow of shift changes, spatial exigencies for networking, multiple handovers, divided and hierarchical disciplinary activities and the contingencies of junior practice, etc.?

The practices I outline here are my analyses based on nurses' and doctors' doings, sayings and beings. In analysing their practices I am describing the values, attachments, even social and cultural knowledges and patterns (Reckwitz 2002) that I found underpin their doings, sayings and beings. These practices are paradoxically 'not directly accessible, observable, measurable or definable' (Corradi, Gherardi & Verzelloni 2010, p. 267) but if, as Gherardi contends, practice and practising are mutually constituted, because 'knowing is a practical accomplishment', this enables us 'to analyze knowledge as an observable phenomenon and

propose a framework that focuses on knowing as a situated practice' (Gherardi 2008, p. 522). This is what I am proposing with this framework.

The term *practising knowing* is used to explicate three principal ideas (Manidis & Scheeres 2013). Firstly, it conveys the developmental understanding of how nurses and doctors muddle through and in so doing, finesse their knowing through their doings, sayings and beings with patients: they practise how to do (and say and be) as they are becoming ED practitioners. I use the word 'finesse' to confer a sense of the skill that nurses and doctors exhibit in handling the uncertainty of their information in approaching patients in what are undoubtedly difficult and highly sensitive moments. They enact adroit and artful management of combining unknowns (exact patient names, pain statuses, allergies, etc.) with many knowns of care – *I must ask about this allergy, I must check the patient's name, I must find out if things have changed.*

Secondly, the term embraces a feigned (although not necessarily unfounded) expertise – where in the roles of nurses and doctors as experts, in the words of Lacan, '[they are] 'supposed to know'' (1977, p. 230-243 in Bradley 2009, pp. 74-5) – they must present themselves as knowers.

Finally, paradoxically, the term also conveys the equivalence of practising and knowing, i.e. knowledge is equivalent to what doctors and nurses do and say (Gherardi 2009), practising *is* knowing. In this latter understanding of the term, nurses and doctors have a repertoire of doings, sayings and beings participating proximally with patients (geographically close to) as they talk and gaze; drawing on protocols (which assist them to act); predicting and finessing their knowing as they simultaneously check, read, scan (and thereby confirm) details; assume (and thereby also check and are reminded of patient and collegiate) details; as they reconstitute their knowing. In the ED, these actions and activities blur the boundaries of safety and unsafety (Jerak-Zuiderent 2012) – safety and unsafety are no longer binaries of action but ways of doing, saying and being *in situ* that recognise unsafety, but which address these issues to ensure safety. These actions and activities therefore offer flexibility and a space for opportunism – in its best sense, i.e. of adapting actions (sayings) for expediency or effectiveness – provided mistakes are not made. On some occasions it is clear nurses and doctors have forgotten information or details; on other occasions it is not clear whether they have forgotten or whether they are merely rechecking. Rather the

iterations, checking, talking are the *modus operandi* of how knowing is done, it is knowing as activity, not as possession.

Based on the data, findings suggest that in reconstituting their knowing, what I might describe as how nurses and doctors have learned to know in practice, they rely more on their capacity to remake their knowledge than on their capacity to remember or transfer information – or even trust information they have been given or knew earlier themselves. Nurses' and doctors' actions and activities as they (re)produce emergency healthcare knowledge both reflect and recreate this fragility, as they collectively and individually seek to overcome the difficulty of working in a system of fragmented knowledge (Bruni, Gherardi & Parolin 2007) and uncertain pathologies.

Even though nurses and doctors frequently communicate, transfer and receive information, they recognise that information *per se* and knowing are not static, reliable and fixed. The indeterminacy of knowing in the ED sees nurses and doctors perpetuating (and adapting) a suite, or repertoire of doings, sayings and beings that have prevailed from standard medical interviews. Team knowledge, as cognitive possession, is not accomplished: the synergies of the team reside in other aspects of nurses' and doctors' work of ongoing collective knowing including seeing and sensing each others' differentiated activities and actions, bodily understanding their spatial co-location and dislocation, and enacting the doing of selective and recursive information renewals. Their activities and actions occur in and across disciplinary boundaries, suggesting that idiocentric work overrides all others as the predominant paradigm of work: and this is done collectively.

The ED is a *locus* of medical and nursing expertise – a *locus* where patient confidence, security and safety are dependent on the expert practice of doctors and nurses. And, above all, it is the expertise of nurses and doctors, and the reliability, safety and efficiency of the hospital that patients and the community most desire. Thus, as a *locus* of expertise, not only must doctors and nurses 'know' and 'do' expertly, they must also *appear* to 'know' and 'do' expertly, even or especially when they are uncertain – whatever the source of this not knowing.

The ED is also a site, like all organisations, in which performances of the unfolding of actions must continue to occur 'as the organization happens' (Schatzki 2006). It is junior doctors who face greater challenges than most as they develop ways to manage both the

certainty and uncertainty of their expertise and their expert roles. Yet for them, and for the ED, the performance of knowledge, through doings, sayings and beings must continue to unfold 'as ED care happens' especially in the face of uncertainty and not knowing. This is because '[t]here are limits to living with uncertainty. It can paralyze action' (Jay Katz, physician Yale Law School Groopman 2007, p. 153). What this means is that hesitation can be costly: in the face of uncertainty doctors must *do* rather than *ponder* what should be done. 'This is a core reality of the practice of medicine, where – in the absence of certitude – decisions must be made' (Groopman 2007). The socialisation aspect of medical training may occasionally 'override moments of professional lapses, including elements of uncertainty and wrong doings' (Sarangi & Roberts 1999b, p. 37).

At the level of individual nurses' and doctors' actions and activities, these appear normal and routine. For example, immediately recognisable to many of us, and even to Jane Edna and Joel as the patients, who were present on the day, are the actions (taking temperatures, recording notes), activities (broader medical and nursing treatments), doings, sayings and beings of the nurses and doctors who care for us. Today, most people would recognise a nurse, a doctor, their uniforms, their dispositions, their stethoscopes, their thermometers, their scalpels and their blood pressure machines, although in the ED their roles, in the absence of uniforms and nametags, are often unclear. In general, though, together with these material objects and in countless healthcare settings, they have been depicted, experienced and documented over time. A great deal of what nurses and doctors do and say, including those of Jane Edna and Joel, they have been doing and saying for years or decades, and these are steeped in medicine and nursing traditions (including cultural traditions and even now depicted on television programs) that are historic, even ancient. When Doctor Louis (D1) or Doctor Surita (D1) insert a cannula, or order Jane Edna's or Joel's X-rays or when the nurses do the observations and/or check temperatures as we see them do, we recognise these practices in the ED. Although Doctor Surita (D1) and Doctor Louis (D1) are still learning what to do, in consultation with their seniors, they gradually develop and learn to do what is required, including learning how to practice in the midst of uncertainty.

But knowing in practice is (meant to be) a collective, individual, organisational, 'interorganizational and institutional' affair (Gherardi 2006, p. 52). Individual nurses and

doctors, the team, staff in the ED itself and others they connect to are 'not only connected but also fused with action' (Gherardi 2006, p. 52).

Practices in the ED are distributed and the knowledge networks illustrate that there are 'social process that weave … individual and institutional practices together' (Gherardi 2006, p. xxi [roman numeral]). Yet, the three lenses presented thus far – working, learning and knowing/not knowing – have shown that little is definitively cumulatively 'known' by team members during a consultation: there is not a solid knowledge or a knowing team as this presupposes knowledge as cognitive, and cumulative and actionable. Although multiple knowers are involved in a consultation, and in many ways what they do could be described as team-based, their knowing is activity-based or idio-adaptive: nurses and doctors have collectively learned to practise as individuals – albeit part of the attempting-to-know team.

This is an emergent collective learning: a feature of the complexity of the disciplinary and institutional arrangements and a reflection of the way that workers engage with information and knowing as activity not possession. This is the way that individual/social knowing transpires and is mutually understood (by those who work in the ED):

> [f]or Schatzki (1996) Wittgenstein's location of intelligibility and understanding is not within discrete minds but in the flow of praxis, and his articulation of how intelligibility and understanding structure human action and the social realm provides a basis for a theorization of practices which recognizes that 'both social order and individuality … result from practices' (Schatzki, 1996, p. 13 in Shove, Pantzar & Watson 2012, p. 4).

Analysis of the data suggests that the actions and activities in the ED generate the social order of care and the individuality of how each nurse and doctor (re)engages with information and knowledge, not as possession but through praxis or idio-adaptation, idiosyncratically and iteratively. Nurses and doctors (re)constitute their knowing individually and repetitively – this is at once collective and individual.

Patients, however, experience this institutional (and working) reality differently, as they expect clinicians to know their story more fully. In healthcare contexts everywhere they articulate that the absence of informational (cognitively possessed) continuity is a significant problem in their care (Fischer & Ereaut 2012; Rogers *et al.* 2005; Safran, Miller & Beckman 2006; Wynia 2012). In the ED the iterative and repetitive questioning is very frustrating as Jane Edna suggests: *Ah you know I've been through it all last week they must have*

records what they did and didn't do then. Similarly, Joel feels *a goose* because successive nurses and doctors fail to get the (cognitively possessed) message about this pain and mobility; rather his nurses and doctors (re)engage with this knowledge as activity: they reconstitute their knowing.

The meta-disciplinary and institutional framework therefore shines a light on the moment of action (doings, sayings and beings) in ED work as most interactions with patients in the ED are ones in which nurses and doctors (can) draw on some existing information about a patient. These are moments when continuity of care is enacted: and continuity of care (nurses and doctors knowing what to do and say to a patient, knowing who they have in front of them, knowing what is the status of that patient's health, knowing what has been done up to now) is a safety and quality issue for patients and for the health system.

Either way, at the level of 'interorganizational and institutional' (Gherardi 2006, p. 52) learning, the data show that nurses' and doctors' largely individual practices from other healthcare contexts are maintained and perpetuated in the ED.

7.2.   A meta-disciplinary, and institutional practice framework

I now present the meta-disciplinary and institutional framework of practices.[25] These practices are 1) proximal; 2) prefigured participatory; 3) predictive or pre-emptive; and finally, 4) protocol or rule-governed. These are all practices that make up the disciplinary knowledges of caring, clinical competence and professionalism. These practices render nurses and doctors institutionally knowledgeable and are ones through which nurses and doctors manage the essentials of clinical work – and in particular configurations – through which they manage (or sometimes not) the fragility of knowledge and knowing that occurs amid the socio-material arrangements of the ED. The practices thus comprise a disciplinary- and institutionally-responsive repertoire of doings, sayings and beings.

In presenting this framework I draw on Reckwitz's (2002) definition of practice(s) both plural and the singular, that allows their interchangeable use, with the singular referring to

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[25] I have drawn on two case study patients in this thesis. Mol (2008, p. 9) warns that case studies 'do not lead to conclusions that are universally valid, but neither do they claim to do so'. I have presented nurses' and doctors' actions and activities (their practices) in the meta-disciplinary and institutional framework as generalisable. I propose that this is possible given that these practices are extant health practices, only adapted in iterativity and frequency in the ED. I also draw on the remaining 80 patients' consultations and the many hours of ethnographic observation to justify the claims I make.

the more abstract concept of, say, medical practice – or in the case of this thesis, to clinical work in the ED – and the plural to describe routine doings, sayings and beings of nurses and doctors. I call them each 'a practice', but they might also be understood as a dimension of ED work as enacted through the consultation (diagnosis). These practices are therefore interconnected, i.e. and although the analysis below focuses on nurses' and doctors' sayings, doings and beings as components of their knowing in practice, other aspects of their work including teleoaffective structuring (attachments to what they do that are goal oriented), are also intertwined with these practices.

Below, based on a set of table headings by Orlikowski (2002), I outline the repertoire of disciplinary and institutional practices, activities and actions of practising knowing in EDs:

Practice	Activities/actions comprising the practice	Knowing/valuing constituted in the practice
A proximal practice	Being next to or close to patients; touching patients; looking at patients; observing patients; proximally examining and exploring patients' histories or symptoms, e.g. taking a blood sample; taking a temperature	Knowing/valuing the patient in an embodied way; knowing/valuing how medical and nursing knowledge is done; understanding/ valuing who the patient is; knowing how to reconstitute knowing; knowing/valuing that significant disciplinary evidence is located in the patient
A prefigured participatory practice	Talking to patients; taking a medical history; asking patients how they feel; asking patients what has happened to them; asking patients to describe their symptoms; pursuing lines of questioning	Knowing/valuing how trust is gained; knowing/valuing how expertise is demonstrated and how knowledge is negotiated; knowing how to participate/valuing participation
A pre-emptive and predictive practice	Asking assumptive questions; exploring and predicting patterns; investigating possibilities through evidence gathering; suggesting and thinking about potential courses of action by ordering ECGs or X-rays for example; forward thinking; prognostication; assessing the patient (and the patient's credibility)	Knowing/valuing how to work in a system of dispersed knowledge and unpredictability; knowing how probability works and valuing symptoms and patterns as significant; knowing how to probe lines of investigation or treatment that might be appropriate
A protocol or rule-governed practice	(Re)checking on a patient's status; reminding themselves what they know or knew earlier; (re)checking patient names; (re)checking what other nurses and doctors have done; (re)checking medication dosages; writing records and notes; following institutional and disciplinary lines of questioning; following tried and tested procedures/ investigations when faced with specific presentations	Knowing/valuing how individual and medico-legal accountability is enacted; knowing how to manage sudden medical deterioration (e.g. heart attack) or common issues (e.g. pain); knowing how to follow/value decision-making processes quickly and decisively; knowing how to operate institutionally

Table 16: Repertoire of practices, activities and actions of practising knowing in EDs

For the purposes of clarity and readability these practices are presented diagrammatically in two groupings and in the discussion they are written up separately. However they do not form distinct categories and in practice this means that in undertaking a particular clinical

action, nurses and doctors might be physically with a patient (being proximal), talking to them (participating), enacting a procedural pathway or rule (drawing on a protocol), while at the same time thinking ahead (pre-empting) a future option for that patient.

Group one: 'Being there'

In Figure 10, one grouping links the diasomatic nature of medicine and nursing, requiring essentially *a face-to-face dialogic and diasomatic* (i.e. a body-to-body) interaction between a doctor and a patient with the *interactional nature and prefigured sayings, doings and beings* of medical interviews (Mishler 1984). That is, diagnostic and treating practices are enacted largely in close proximity to the patient (a proximal practice) and this practice is closely linked to the language that doctors and nurses use when talking to patients (an enduring prefigured participatory practice) (Roter 2000).

A proximal practice

Actions &
activities
in the ED

A prefigured,
participatory
practice
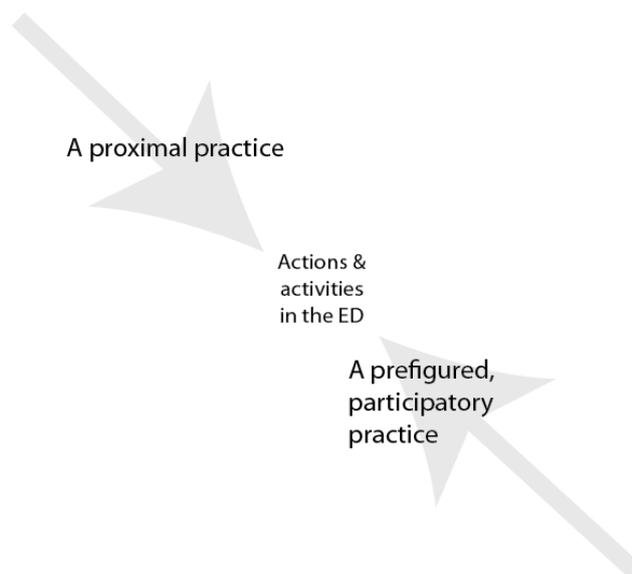
Figure 10: Proximal and prefigured participatory practices

Group two: 'Thinking ahead'

The other grouping of the figure links a predictive and pre-emptive practice, the *hypothetical nature of medical decision-making* with probability and likelihood, i.e. prognostication – essentially tools of forward thinking – to *medical and nursing protocols,* i.e. a protocol driven practice. Protocols are essentially a part of a pre-emptive practice that have come into common usage because they provide a pathway (a road ahead), a prognosis (likely future scenario), or set of rules to be followed when faced with a particular problem, or even uncertainty.

A protocol or rule-governed practice

Actions &
activities
in the ED

A predictive,
pre-emptive
practice

Figure 11: Predictive, pre-emptive and protocol or rule-governed practices

Together these make up the meta-disciplinary, and institutional framework of practices.

A proximal practice   A protocol or rule-
                              governed practice

Actions &
activities
in the ED

A predictive   A prefigured,
pre-emptive,   participatory
practice   practice

Figure 12: Meta-disciplinary and institutional practice framework

Each of the above types of practices is recognisable, prevailing medical and nursing practice and each is re-enacted in particular configurations in the ED. Drawing on the data, each of these is discussed below.

7.3.   A proximal practice

Chapter Six, drawing on linguistic ethnography and practice theory analyses, illustrated how the (re)production of healthcare knowledge takes place in a particular way in the ED through multiple visits to patients' bedsides. The multiple visits 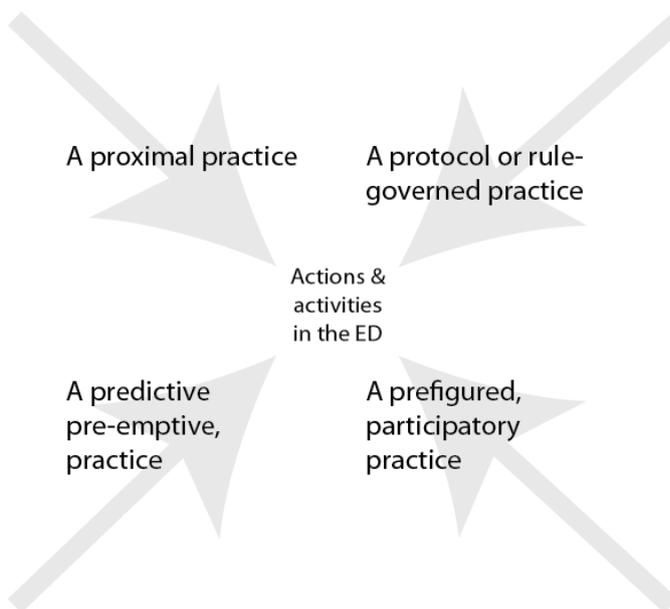are a feature of the timespace of the ED; these are divided disciplinary activities involving care that is enacted in proximity to the patient and is a response to the material arrangements of the ED. Analyses of the data highlighted how nurses and doctors use the face-to-face encounter (as a proximal practice) to reconstitute knowing.

The word 'proximal' as used here implies being close to the patient in a physical sense where a doctor or nurse may simply be next to, close to or beside a patient. But it means more than this as being with a patient enacts the way that care – other than in telemedicine – happens. The term also describes how knowing is done proximally, through touch and gaze, for example, and in a practice-based context, particularly in medicine and nursing, ways in which knowing is more than a cognitive doing – it is embodied, it is teleoaffective, it is relational. Strati (2007) explores knowing and proximal 'presence' in a practice-based approach. Strati draws on Merleau-Ponty's theorisations 'that the Other is knowable through a person's gaze, gestures and looking, that is through his/her body' (2002, p. 44 in Strati 2007, p. 1350). In the ED, proximal addresses a key aspect of how this knowing is done specifically through revisional sayings and doings involving reading notes, talk and clinical examination.

The analysis shows that information is actively utilised, acted on and/or processed when doctors and nurses are ready for it, have had a chance to process what the information means in their knowledge schemas. They manage information as and when they need it, as and when it fits into a temporal schema of *What is needed to be known/done now or next?* – not necessarily when information is 'transferred' to them. This practice lends weight to the understanding of how and when medical records are used (Hobbs 2007) as they link in complex ways to hospital discourses.

Each nurse or doctor individually (or in consultation with others) needs to *situate and reconstitute* what they know in the here and now as they grapple with or respond to their surroundings or the patient: *What about this patient now? What's next? Where am I up to?* The notion of practical intelligibility, 'what makes sense to them to do … in the current

circumstances' (Schatzki 2001b, p. 47) is at work here. This is not necessarily a cognitive understanding, but rather action in that moment is performed or enacted. Nurses and doctors respond spontaneously, bodily in a dialogic sense, what I am calling a diasomatic way, much as Schatzki (2009, 2010b) describes the way that actions befall us. This diasomatic response may also be reflected in the way that doctors and nurses use the ED bedside space proxemically – as their particular symbolic, disciplinary and communicative roles play out in the bedside space. Proxemics, 'the use of space in communication' (Hunter & Scheinberg 2012), first assists us to understand, as the data show, the immediate response to each others' presence – as the doctor enters the bedside space, the nurse leaves, or vice versa. This reflects the disciplinary boundaries that exist between them in the frontstage, although these boundaries have been found to be less distinct and more informal in backstage or non-clinical spaces (Hunter & Scheinberg 2012).

This finding shifts the focus of attention from handovers – what is given to doctors and nurses – to what they do and say, to the enactment of their knowing, in the bedside space. Codified patient details are told, but this does not necessarily inscribe them into knowing.

Reconstituting knowing in a proximal practice is embodied in the timeless image of a nurse or a doctor looking at a patient chart while standing next to a bed as he or she considers where they are up to, what has been done, what needs to be done next. This is a practice recognisable to patients, colleagues and carers. This activity scaffolds learning about (and knowing) the patient.

A proximal practice understanding of 'care' is that proximal action can be seen as a natural place for an emergent, situated practice of remaking or working/knowing; this moment affords a temporal, proximal opportunity for 'learning' or 'revising' for the nurse or doctor in a number of ways. Proximity to the patient is a feature of safe practice[26] – see recent proposals regarding the introduction of hourly nursing rounds in the National Health System in Britain (Topping 6 January 2012, The Guardian). For example, when there is a patient at risk in the ED such as a mental health patient who is likely to be a danger to themselves or others, they are assigned a nurse known as a 'special' – someone who sits next to their bedside. This nurse may not leave the patient alone. A similar practice exists in Intensive Care Units (ICUs) where attending nurses and doctors rotate between themselves

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[26] Except for iatrogenic errors – when doctors or nurses may transfer infection to patients or when malpractice or incompetence occurs.

less frequently than in the ED. Patient-clinician ratios are lower than those of EDs and ICU spaces are smaller – proximity is built into both the staff scheduling and the spatial design. In the same way if there is a Medical Emergency Team (MET) call in a hospital when a patient collapses or goes into cardiac arrest, or if a patient requires resuscitation in the ED, attending nurses and doctors are proximally involved in the collapsed patient's care – this is the very essence of urgent, acute and safe care.

Proximity is also a key component of nurses' and doctors' communication-and-information-sharing practices (Coiera *et al.* 2002; Ellingson 2003; Hunter & Scheinberg 2012; Long, Iedema & Lee 2007; Reddy & Spence 2008), although in the ED, the bedspace is generally *not* used as an information-sharing space across disciplinary boundaries as the data have illustrated and as also identified by other studies (e.g. Creswick, Westbrook & Braithwaite 2009).

This notion of 'proximal' is a key focus of attention in practice-based studies, as embraced by Gherardi, but the term in her case is used in relation to 'distal' (Gherardi 2006). 'Proximal thought addresses what is continuing and incomplete toward which it constantly strives but never reaches' (2006, p. 51) whereas distal addresses complete, finished products of thought and action. I use proximal in a different sense, but with a meaning that connects to the idea of what I mean by finessing knowing, which may also in a way be connected to Gherardi's idea: that proximal thought (or action) is never complete. By finessing what they know about patients as they enact doings and saying, knowing is emergent – the view that there is 'pre-packaged' information is shown to be not the case from close up – here everything is rechecked, refined and reworked, based on the understanding that information has been lost, forgotten and/or misinterpreted earlier.

My definition of proximal is intended to convey the almost universal requirement (and practice) of geographic co-presence as doctors and nurses interact with patients and the material environment around them and during which they enact recursive actions and interactions. Simultaneously, it incorporates the spatio-temporal and emergent nature of working, i.e. organising, that Gherardi posits in her definition. Examples from both Jane Edna and Joel's consultations illustrate how nurses and doctors do this in practice.

One of the ED directors interviewed indicated that patients could be unreliable when it comes to remembering what they have said previously (which assumes a cognitive model of knowledge). Her comments point to some of the judgements doctors make about the

(un)reliability of patients, although she does acknowledge that clinicians themselves might make their own mistakes in writing things down. The combination of both the patient's and the doctor's (or nurse's) fragility around knowing renders the accuracy and reliability of information even more tenuous:

> They don't, you know, they can't remember. They don't know. And so you rely on getting a lot of extra sources of information. You see patients don't hear you. **Patients don't hear what you say and they may answer questions but they're not really thinking because they've got too many other things that they're worried about.** I think you make an assessment always about somebody's reliability. So you do that first of all. And the second thing that you do, we all do is **that key points have to be asked over and over and over and it drives patients crazy.** But that's why you have to do it, because the answers change and what you tell me, I may make a mistake when I write it down, or you may change your answer. And we hear that over and over again from patients. Well you know you've asked me that 50 times and I keep telling you. And yes, most patients will give you the same answer, but there's [sic] lots of patients who give you a totally different answer when you ask them again. (Interview with ED Director: 27112007)

The unfolding of the performances of actions in the ED takes place over time. During one consultation there may be several changes of shift with new personnel, lunches, tea breaks, absences and returns and the passage of time creates particular problems for nurses and doctors. *In situ*, ED consultations are organised across space and time, and according to institutional requirements. The impact of the spatio-temporal nature of ED work – impacted on by memory (or overload), difficult interprofessional relationships and unreliable sources that take place in emergent ways – reflect the complexity of working/knowing with so-called fixed knowledge (or information) that is distributed among multiple knowers. This proximal practice is where nurses and doctors reconstitute their knowing dynamically as care happens, and is key to understanding how safe practice is enacted.

7.4. A prefigured participatory practice

Knowing-in-practice (Gherardi 2006) is accomplished through prefigured, situated engagement with patients or participatory talk. The medical interview is a task that cannot be delegated (Simpson *et al.* 1991). 'Questioning and answering are [still] the prime organising elements of the goal orientated and constraining nature of [this] institutional [consultation]' (Sarangi & Roberts 1999b, p. 21), i.e. the medical interview. Questioning patients is a standard feature of the medical diagnostic process; it is *the* way, combined with

evidence and physical symptoms that doctors and nurses work and know in the ED. This prefigured participatory practice takes place between nurses, doctors and their patients (Mishler 1984), and among themselves (Coiera *et al.* 2002) as they resource their knowing ongoingly. But as the extracts and examples indicate, whether it is patients who seek to participate – or not – or nurses or doctors who do so – or not – knowing is mediated disciplinarily, and institutionally.

Gherardi's work has outlined the inseparability of working and knowing, as the above embodied, extra-individual actions of the junior doctors and nurses have illustrated. What each clinician finds out is ephemeral, and as these members of the clinical team remake their knowledge with Jane Edna and Joel into explicit and specific care, the current model of ED care relies on them transferring this knowledge to the team across divided disciplinary, and therefore knowledge, or epistemological, boundaries (Cook & Brown 1999; Stein-Parbury & Liaschenko 2007). They must also cross time and space in the spatio-temporally distributed work (Engestrom 2008) of the ED, finding IV poles, notes, medications, sheets, bedpans, stickers, X-rays and faxes from other hospitals – they do this dynamically. Nurses and doctors shift to and fro between knowing and not knowing: they experience the fragility of knowing.

> I would hate to be the nurse who missed something. We are paranoid – we check and ask questions all the time. This [repetitive questioning] is perfectly understandable – managing pain is one of our central concerns. I tell my patients – 'You are going to be asked the same question over and over so be prepared'. (Focus group comment by Senior Nurse: 15092009)

This individual and collective remaking of knowledge presents an irresolvable tension of managing and organising knowledge and activities at the level of work in these contexts, through organisational mechanisms that Greenhalgh *et al.* call

> standardization (which helps stabilize the network [the stages of care]) and contingency (which reflects and responds to local needs and priorities [the missing IV pole, the missing medication order, the as yet un-faxed reports, misplaced notes]); [this tension] must be actively and creatively managed – and this gets harder as the network gets bigger' (Greenhalgh *et al.* 2009, p. 759).

However, dynamically, at any one point in time, knowing about Jane Edna and Joel (and even knowing involving collegiate actions or whereabouts) is always partial and distributed – something about each of them is known at a moment in time, by each of the junior

doctors and the nurses, then it is geographically distributed to either another nurse, or another doctor, or in a file note (or not). These knowers and the notes, X-rays and Jane Edna and Joel themselves constantly move about. Sometimes little or nothing is known about a patient that a nurse may be allocated or called to – for example, when N4 (the in-charge nurse) is called in to give Joel a glass of water (see example 15 in Table 12) or when N6 is called in to suddenly care for Jane Edna's chest pain.

But talk is central to knowing, no matter how difficult interacting might be. The persistence and pursuit of knowing, required in this action, is illustrated in several examples in Chapters Four, Five and Six. The whole ED consultation, and clinician's multiple visits to patients' bedsides, are testament to the complex negotiations between doctors, nurses and patients as they accomplish knowing through prefigured participatory questioning and answering practices *in situ*.

For example, in Joel's consultation, Doctor Surita (D1) enquires on three occasions when the first diagnosis was made, and he only writes the responses down on the third occasion. Doctor Surita's (D1) history taking protocols have been disrupted by the failure of Joel's previous notes to be faxed over in time – a socio-material resistance to the linear flow of activity in Pickering's (1993) terms – notes Doctor Surita (D1) is relying on for a synopsis of Joel's history and a retake of which he now must do in real-time. The failure of the notes to arrive is a dynamic and emergent event – an intervention that requires Doctor Surita (D1) to adapt his work and responses in different ways. Knowing about Joel throughout this consultation is a tortured event for Joel, Jill and Doctor Surita (D1).

In Joel's consultation, Doctor Surita (D1) and Joel's wife Jill seek very different outcomes from the ED consultation. On the one hand, Joel and his wife have come into the ED on this day to find out what is causing Joel's sudden, extreme pain. They hint at the possibility of Joel needing a Magnetic Resonance Imaging (MRI) scan, but Doctor Surita (D1) advises them that this is not an adjunct procedure in the ED and is therefore not likely to happen. On the other hand, Doctor Surita (D1) is on another trajectory – he seeks to better understand the medical history of the person he is charged to look after and must suggest a treatment plan/diagnosis.

Doctor Surita (D1) repeats questions; tells Joel's wife she has not told him things (that maybe she ought to have). Doctor Surita (D1) meets further difficulties in terms of finding out information when he is unable to contact Joel's palliative care team. The extended

knowledge networks involved in Joel's care show how articulated care across hospital sites, individuals and objects (the notes and X-rays) covers the interconnected links of knowing. Doctor Surita, the junior doctor, struggles to weave together codified patient knowledge and objects that are geographically and spatio-temporally dispersed.

Doctor Surita (D1) seeks to know certain details about Joel, not what Joel's wife wishes to tell him, and he also wants to have the information packaged in a particular way: *if you can tell me approximately that will be fine.* Jill has previously given him too much detail, and she expresses some annoyance through *I just said, ah ….* Doctor Surita (D1) responds to this with frustration when Jill repeats what she has already told him: *Yeah, you told me 5/5, yeah*, and seeks more legitimate (medical) evidence, via the scan report: *Do you have the scan report?* He seeks evidence from previous notes, previous X-rays, and the palliative care team. This interaction continues the very difficult negotiations between Jill and Doctor Surita (D1) that characterise Joel's entire consultation; they experience several misunderstandings. 'Epistemic authority' (Heritage & Raymond 2005), the battle of possessed knowledge, is at the basis of their contestation: Jill takes on the role of knower about Joel's condition and in so doing overwhelms Doctor Surita (D1) who tells me (the researcher) that she is confounding him with detail. On the other hand, Jill (Joel's wife) tells me (the researcher) Doctor Surita (D1) is not listening to her.

Finally in another extract where a senior doctor checks up on a patient's medication (reproduced above in Table 15, example 16), a patient's wife has already handed in a list of the medications, and they have also been written down by one of the nurses. Both these lists are in the notes. It takes 17 exchanges by the senior doctor to establish an already well-documented fact. At one point the patient makes a mistake where he says '*four*' then changes this to '*five*' 150 tablets. The senior doctor does not have English as his first language and tends to repeat what he hears, either for clarification or confirmation – possibly for safety. This further complicates the exchange as medication amounts are repeated in statements, but they are taken up as questions or the other way round. Despite the difficulties of the exchange, both parties continue to participate.

The prefigured participatory practice is one that is enacted with patients, appearing regular in a GP consultation, but emphasised in the ED where the performances of this action unfold iteratively and, based on the data, excessively (for patients' comfort, but required for

their safety). In the ED context, this practice strengthens knowing as embodied, idiocentric and spatio-temporally responsive.

7.5.   A predictive/pre-emptive practice

Institutionally, EDs are a place of expert knowledge – the predictive nature of differential diagnoses as well as the need to 'appear to know' in this context involve pre-emptive and predictive sayings, doings and beings. Handover protocols as well as differential diagnoses incorporate implicitly or explicitly significant forward thinking about what care or action in relation to patients might be required, or where a diagnosis might be leading. While handover protocols and differential diagnoses usually incorporate a history of patient care up to that minute, they are essentially focused on predicting or pre-empting future options. As such they are thus based on known and presumed medical and nursing knowledges, knowledges that are central to the practices themselves. Below, a senior staff specialist sums up the process of 'forward thinking' engaged in by nurses and doctors in the ED. He responds to the question *What happens to patients in the ED?*

> Alright so they [patients] get seen by a doctor. That doctor may or may not be senior enough to **make a decision about what should happen next.** Let's say it is a doctor such as myself that's senior enough to **make decisions.** So I'll see the patient, take a history, examine the patient, **have some ideas in my head** about what **could** be wrong, arrange some tests probably **to test the hypotheses** and evaluate the extent of their disease. In the meantime, start some initial treatment and then depending on the results of tests, once I've **made a decision** that we've gone as far as we can in the Emergency Department or gone as far as we should, then **we'll make a decision** about whether the patient needs to be admitted to hospital or needs to go home. (Interview with ED Staff Specialist data: 071211)

Kemmis' idea of 'craft knowledge' – 'knowledge in the face of uncertainty (2005b, p. 396)' – the *wisdom* and experience that guide one in uncertain circumstances captures this notion of forward thinking well. To say this is to draw attention to *practical reasoning* as a feature of the conduct of a practice, which may accord with Schatzki's notion of 'practical understandings' executed through 'practical intelligibility' which assists nurses and doctors to do what makes sense to them to do (2001b, 2002, 2006). Nurses and doctors use craft knowledge to predict and pre-empt knowing about patients in the ED – much of which is reflected in their sayings and beings *qua* doings. This is evident in the example with N6. Jane Edna tells me that she needs to talk to someone urgently. I, the researcher, call N6 who is passing the bed. N6 is not allocated to looking after Jane Edna. N6 knows nothing about Jane Edna, but approaches Jane Edna and immediately asks her what the problem is.

This is a senior practitioner's 'craft knowledge' (Kemmis 2005b) at work. Not knowing anything about Jane Edna, she is called to assist suddenly and says: *No that's alright I'm just in a totally different area so I don't have a <u>clue</u> what's going on but I'll put the monitor on as a step one ((drawing on craft knowledge)). Where are we – oh we do have an oxygen mask there? I'll put the oxygen on see if that helps with your pain.*

Tacit knowledge is not just made explicit, as Gherardi warns (2009, p. 354), but it is made specific, and this is based on some foreknowledge of the practice, forward thinking of what might be required next, or of what might happen next, i.e. a prognosis.

Using predictive or 'craft knowledge' is one of the ways nurses and doctors manage their care of patients in the ED, i.e. even when, particularly when, their knowledge is not certain. Not only do they bring to the bedside 'general and practical understandings' (Schatzki 2001a) of what to do, they *must* demonstrate early on, as they approach patients (usually through 'sayings' *qua* 'doings') a working/knowing of what to do and say. They must finesse their knowing.

Managing indeterminacy in a knowing way is a learnt component of how to work in health and particularly in the ED. Thinking ahead is a part of what nurses and doctors do. For example, as I identified above, Joel's junior doctor, Doctor Surita (D1), picks up Joel early (before his triage record is fully entered into the computer system). Before he sees Joel, he asks Nurse Nelly (N3), in an aside: *Cancer, or something…?* Doctor Surita (D1) knows almost nothing about Joel as he approaches him. Although he has sought to find out something from the first nurse he meets, Nurse Nelly (N3). His asking her *Cancer, or something* is partial knowledge only. He knows he must find out more before he speaks to Joel, as he has only seen Joel's triage notes on the computer. So he approaches Joel's wife who tells him that Joel's pain has been excruciating in the past couple of weeks. When Doctor Surita (D1) finally steps up to Joel at this bedside, his opening statement is: *Hi … you seem to be in excruciating pain today?* Doctor Surita (D1) seeks to finesse his knowing pre-emptively, but like 'leg holder' Nurse Janita (N2), his statement is incorrect. Joel contradicts his pre-emptive question: *Not when I'm lying… if I'm – if I'm not moving, no pain.* All Doctor Surita (D1) adds to the discussion at this point is: *I see.* The knowing/not knowing about Joel's condition is, however, not finessed on this occasion in the moment that Doctor Surita interacts with Joel, through a pre-emptive question. Even though the detail of *when* Joel feels pain has been recorded by N1 (the triage nurse), and although Joel's wife knows this

and has been talking to Doctor Surita (D1) prior to his approach to Joel, Doctor Surita's (D1) pre-emptive question misses the mark. But the pre-emptive comment illustrates the 'in-the-moment reconstruction of thought and action, [and how] knowing may be altered' (Orlikowski 2002, p. 253).

There is a constant epistemological game that is played out in the ED between patients, nurses and doctors (Tannen & Wallat 1987). On the one hand, nurses and doctors know little about their patients (or have limited medical certainty) but they must portray knowledge, and one way of doing this is through predictive or pre-emptive actions. This game is, according to one medical educator,

> one of the most remarkable human psychological traits. It is both adaptive and maladaptive, and therefore both guides and misguides… Physicians' denial of awareness of uncertainty serves [a pervasive and fateful human need to remain in control of their internal and external worlds by seemingly understanding them, even at the expense of falsifying the data…]: it makes matters seem clearer, more understandable, and more certain than they are: it makes action possible (Groopman 2007, p. 153).

On the other hand, nurses and doctors know more than they reveal to their patients in a practice that Goffman (1959) refers to as backstage/frontstage presentation – posturing scenarios where different realities play out in different spaces of the ED.

In the ED, the nature of the game is simultaneously spatio-temporal and discursive, i.e. knowing/not knowing happens in the moment that the encounter takes place at the bedside through language (and sometimes through actions), and because nurses and doctors do not know patients well, as their regular GP might do, these moments of discovery, or moments of selective display or packaging of knowledge, are precarious.

Jane Edna does not know that her junior doctor already has some knowledge of why she is there from the ambulance officer; Doctor Louis (D1) does not tell her this either as he begins to ask her (apparently from a basis of <u>no</u> knowledge) why she has come in today. In doing this, doctors and nurses use what education labels display questions (O'Keeffe, McCarthy & Carter 2007) – questions to which they already know (part of) the answer – but patients do not know this. The aged care nurse, Pamela (C1), too, knows something about Jane Edna, but she checks again why she is there and what others have done for her until now. In this, she brings together her practical understanding of others' roles, and her

need to know and check at the same time as she interacts with Jane Edna. She must finesse her knowing.

Predictive or pre-emptive practices can lead to harmful practice as well. In the 'leg holder' example presented in Chapter Four, Nurse Janita (N2) enacts predictive, pre-emptive actions. Nurse Janita (N2) assumes authority (over the ambulance officers) as soon as she enters the bedspace. She enacts her nursing knowledge and does not wait to hear from the ambulance officers, Z1 and Z2, about what might be wrong with Joel. She pre-empts incorrectly and makes an assumption that Joel has fallen over. In this instance, she does not constitute her knowing before she acts and as a consequence, harms Joel.

A close look at what transpires reveals that Janita (N2) has little time or no desire to develop any shared knowledge with Joel before she comes to assist him. She does not seek or heed the advice of the ambulance officers who are trying to tell her about Joel's pain if he is moved, information which they try unsuccessfully to pass on to her. She is therefore unaware of the fact that Joel feels terrible pain if his leg is moved, but *they* know this only too well, having been with him for the past hour or so while transporting him to the ED. This episode illustrates both the complexity of work, but also what happens in the rush of the moment as Janita (N2) moves Joel's leg without having developed any shared knowledge with him, as the action befalls her.

So many practices, activities, and actions – disciplinary, social and clinical beings, doings and sayings – are interconnected with objects (sheets, slides, beds, crutches, pillows); the spatial and material arrangements (where Nurse Janita (N2) and Z1 and Z2 stand, how they move, how they cross Joel's arms, touch his legs); and language, in this short seven-minute episode between N2, Joel and the ambulance officers. No handover protocols have been followed or been enacted from triage (which N1 has completed moments before). Knowing between Nurse Janita (N2) and the ambulance officers has been hampered as Nurse Janita (N2) enacts her nursing knowledge at the expense of the ambulance officers' knowledge: a disciplinary hierarchy has prevailed and Nurse Janita (N2) does not listen to the ambulance officers.

This event draws attention to key concepts of the study. The first is the idiocentric nature of each nurse's and doctor's work. It demonstrates how one isolated action – what Schatzki would call an 'event' (Schatzki 2011) – can be harmful. This 'event' also illustrates how momentarily one action can be enacted, isolated from the virtual knowledge networks

surrounding Joel – from codified knowledge that is located in the triage notes, or what the ambulance officers, or Joel himself know. The action is pre-emptive, fragmented and potentially harmful as knowing is not reconstituted. The episode reinforces that learning, working and knowing are relationally and situationally connected (Schatzki 2001a): even though an opportunity to communicate might exist, this does not always translate into knowing.

Nurse Peter (N5) makes a prediction about Jane Edna's care with her, but get things wrong, although this does not lead to harm. On several occasions he seeks to finesse his knowing pre-emptively, but unfortunately makes assumptions that are incorrect, once again highlighting the precarious moment of enacting care. Nurse Peter (N5) and Jane Edna misunderstand each other with Nurse Peter's (N5) use of the word abdomen. He says to Jane Edna: *Yeah we can't give you anything at the moment because you've got some pain in your abdomen we can't give you anything to eat or drink.* Jane Edna responds: *No I haven't any pain in my <u>abdomen</u>.* He proceeds to then take a stab at it: *In this sort of – in this general area?* Nurse Peter (N5) then confirms some knowledge of why Jane Edna has come in and what she has experienced: *You've had, you had it today though?* Once Jane Edna confirms this, he gingerly proceeds with a reason as to why she cannot have any food just now. The use of terms such as *sort of … general area* is his way of getting around the specifics of her care/condition. It is also the way that Nurse Peter (N5) reconstitutes, and alters his knowing (Orlikowski 2002). For Nurse Peter (N5), this is a moment of reflection and experimentation and in this moment his knowing is altered as he experiences and (re)interprets the world: a moment of learning? Nurse Cate (4) when she approaches Jane Edna also knows something about her – she greets her and knows she must say something that is consistent with a likely scenario of care, combining her knowing and doing through discursive practices – which are action based (Gherardi 2008) and therefore praxeological. She opens by saying: *We're going to have to do a cardiograph and check your heart.* Her more senior counterpart Nurse Noreen (N3) points out that she has pre-empted incorrectly: *She already had an ECG so it's just cardiac monitoring…*

Occasionally nurses and/or doctors acknowledge that another doctor or nurse has told them something about the patient or they tell patients they have read their notes. This is clear below in the opening lines from a fourth doctor who sees one patient:

> Now I talked to the doctors who saw you earlier … but um this is really important
> for me and I know you've talked to a few doctors and you've given them your
> story too, like two or three people … but I need to know the story again too so
> I'm sorry, can you please tell me exactly what happened at 12 today… (cited in
> Manidis & Scheeres 2013, p. 11).

The foreknowledge doctors and nurses have assists them to frame their knowing/doing in a delicate balance of displayed knowing that is reassuring for patients, but which is potentially problematic if they assume too much and/or predict incorrectly.

Up to now, I have discussed this practice primarily in terms of how doctors and nurses know in practice (manage the indeterminacy of the ED context) by talking to patients in the ED, not in terms of how they know in practice through participatory talk with each other. Talk with each other is extensive (Coiera *et al.* 2002) but as noted in Chapter Five, learning and communicating are embedded in disciplinary paradigms (Contu & Willmott 2003; Creswell 1998), and clinicians' attachments to their practice knowledges (Reckwitz 2002) in a way, limit, or constrain their knowing in practice. In this, knowing is past, present and future-oriented, not just emergent, and nurses' and doctors' activities and actions remain prefigured by extra-individual disciplinary and institutional roles. In the ED context, this practice strengthens knowing (in practice) as relational, disciplinary, contingent and complex.

7.6.   A protocol or rule-governed practice

All practices are governed by rules and protocols (Schatzki 2002, 2006). However, in medicine and nursing, protocols play a large part in the professional enactments of nurses' and doctors' everyday work. Doctors and nurses are taught particular ways of dealing with patients, particular illnesses and injuries. These include how they ought to follow a 'pathway' for particular presentations, e.g. chest pain; how they should undertake guided history taking; suggested ways to interrogate the mental impairment of patients; clear questioning protocols around name-checking and a focus on the need to establish whether patients are in pain, etc.

Protocols are designed to reduce errors, provide quick solutions to common problems, and create general understandings between practitioners and thereby reduce critical incidents

and eliminate harm as well as costly and lengthy investigations. The 'correctness' of protocols is

> based on the segmentation of therapy and intervention into an array of microactions ordered into a correct sequence, resulting from a rationalization of medical knowledge intended to deprive individual actors of margins of discretion …which serves the purpose of limiting the margins of error caused by the human factor in rational medical reasons (Bruni, Gherardi & Parolin 2007, p. 88).

Knowledge of protocols and action are closely connected: 'We not only work with protocols. We think in terms of them' (Knorr Cetina 2001, p. 178).

Many protocols become embedded in practice and 'evidence-based medicine' is strongly encouraged, despite claims that hard evidence on which protocols and evidence-based care are meant to be based 'is a socially and historically constructed effect' (Wood *et al.* 1998, p 28 in Chambers & Dopson 2003, p. 176). In reality, 'competing bodies of evidence are able to support any position' (Wood *et al.* 1998, p. 28 in Chambers & Dopson 2003, p. 176; Groopman 2007), and different safety protocols abound (Hor 2011). Healthcare is familiar with the contestations of knowledge where according to Nicolini 'in no other sector is politics played so clearly around what is known and what counts as evidence' (Nicolini *et al.* 2008, p. 259).

Yet in line with these protocols nurses and doctors recursively draw on protocols more so than in other organisational contexts. For example, they do this more than their professional counterparts in academia, education or the finance industries, although all practices have protocols (and rules) that guide action. Reliance on medical and nursing protocols may be enhanced in the ED as nurses and doctors have come to recognise that here knowledge is not a static, transferable commodity and that knowing/working is a 'mangle' (Pickering 1993) of practice: thus they practise accordingly.

Protocols assist to cut a swathe through the complexity of the materiality and knowing involved in each consultation as well as the complexity of each patient's presentation. Protocols also facilitate the recursive checking of details (see the earlier example of the 'paranoid' nurse). In another example, Joel's medical history over the past five years has been outlined extensively by his wife Jill, but through protocol-based questioning, Doctor Surita (D1) is able to conduct legitimate iterative checks.

Protocols also facilitate some of the social dimensions of communicating in care, such as using patients' first names. Knowledge is once again not cumulatively possessed as one of the ambulance officers (Z1) uses Joel's non-preferred name once; N2 makes the same mistake on two occasions. Jane Edna corrects her name five times; nurses and doctors use her non-preferred name seven times and she tells them several times what her preferred name is.

Jane Edna is queried ten times about her allergies, three times by Nurse Cate (N4) in the space of two minutes: *Oh, we've got one here. So you're not allergic to anything? Now, are you allergic to anything?* Several minutes later: *You're not allergic to anything that you know of?* Doctor Surita (D1) has already asked Jane Edna if she has any allergies but he checks again. This occurs at 12.54pm: *Any significant allergic reaction?* Roberts *et al.* refer to this as 'storage failure' (2003, p. 197), a phrase that reinforces the possession view of knowledge, rather than knowledge as activity. In this view of knowledge, these questions are indications of how knowledge is done together, as an iterative and recursive activity.

As they do with Joel, doctors and nurses arrive at Jane Edna's bed, they need to leave, they return. They ask her the same things over and over again and do the same tests over and over again. While the focus here is on the sayings, these are connected to other doings, to the spatial features of ED care; to knowing about Jane Edna; to relationships between the nurses and Doctor Louis (D1) who care for her; and to the specialised knowledges involved in treating her, expert evidence and tests – a materiality that is difficult to counteract in this expert place.

The iterative questioning of Jane Edna on her allergies and about Joel's pain have illustrated the recursive nature of how nurses and doctors reconstitute their knowing. I examined how on different occasions Nurse Cate (N4) also repeats her question about Jane Edna's allergies, as does the radiographer (Ra2) (not shown). These are protocol driven questions and each nurse or doctor is responsible for their own knowledge about the patient and their ensuing actions. Even though Nurse Bella (N2) is present when Doctor Louis (D1) questions Jane Edna about her allergies, Nurse Bella (N2) still asks the question herself; Nurse Cate (N4) asks the question three times over; and Doctor Louis (D1) also checks twice on the same information.

The orderlies must check Jane Edna's and Joel's names before they move them to radiography. This is one of the many rules or protocols that Doctor Louis (D1), Doctor

Surita (D1) and others need to adhere to when working in the ED. All nurses and doctors must follow this protocol, even though on occasion repetitive checking leads to confusion for patients and carers. In Joel's case, the orderly fails to follow the protocol as he arrives to take him for his X-ray: *How are you going? We'll just take you for an X-ray.* He does not check that he has the correct patient.

Another protocol that governs nurses' work is that they require medical endorsement from the junior doctor (a medication order) to administer medication to Jane Edna and Joel. Doctor Louis (D1) as the junior doctor effectively 'gives' the instruction to Nurse Bella (N2) to administer the medication. This is 'accomplished' socio-materially through the medication order, then via the IV pole and the talk. Occasionally, the enactment of protocols or rules varies in practice, for example, when Doctor Surita (D1) does not write up the medication order or when Nurse Leah (N6), while not 'officially' permitted to talk about the X-ray, tells Joel's wife Jill, unofficially, that she can arrange an X-ray: *And we can get an X-ray and a CT, and talk to …*

In the parameters of these disciplinary and institutional exigencies, nurses and doctors must constitute and reconstitute their knowing several times during one patient's consultation, particularly if a patient has a long stay. Because of the length of time Jane Edna is in the ED, she first sees Nurse Peter (N5) at 13.56pm and he re-engages with her at 18.05pm. By this stage he has forgotten both her wish to be called 'Jane', which Jane Edna alerted him to at their second meeting, and that she has had a CT scan, even though he was the nurse who told her earlier in the day she was booked to have one. Nurse Peter (N5) is also unaware of the treatment that she *has* had in the interim since he saw her at 13.56pm. Nurse Peter (N5) is about to do an ECG but does not know that she has already had two ECGs. In this moment, he begins his interaction through a protocol of 'informing the patient', Jane Edna, of what is about to happen: *Edna we're just going to do an ECG as well, have you had one of these before?*

N5 follows his initial statement of what is about to happen with a protocol or rule-governed question: *Have you had one of these before*, not knowing Jane Edna has already had two that very day. This suggests a number of possibilities: N5 has not read Jane Edna's notes, he has not been given a handover, he has been given a handover and has forgotten, he has simply forgotten, or finally, this is his way of finessing his knowing. He has to explain very quickly what he means, as Jane Edna now thinks she might be going down to

radiography to have another CT scan, which she found very traumatic. Doctor Louis (D1) corrects Nurse Peter (N5).

Nurse Peter (N5) adopts a sympathetic response to Jane Edna's fears, explaining carefully what the pending ECG might involve and tells her reassuringly where this will take place: *Right here. We're going to it right here – one right here. It's where we put some stickers on your chest and we connect the leads to those stickers and take a graph of your heart.* He asks gently if he can do it: *Can I do that?* Jane Edna then asks him what she had had earlier and Nurse Peter (N5) gets the response wrong; in the moment, knowing is accomplished by Doctor Louis (D1) who corrects Nurse Peter (N5): *A CT scan. You had a CT scan* even though Nurse Peter (N5) apparently knew this earlier in the day as he told her she would have one. The specific knowledge he had much earlier about Jane Edna's care is evidently lost – not a reassuring scenario for Jane Edna, but potentially worrying if the information were to be a more important detail about Jane Edna's care. Doctor Louis (D1) advises Jane Edna that she had a CT scan not an X-ray.

Nurses' and doctors' protocols are enacted in recursive professional engagement strategies enacted through doings, sayings and beings to manage working and knowing. Occasionally nurses and doctors admit they have forgotten something as evidenced in the example below with Joel. Nurse Nelly (N3) has little, or at best an ambiguous recollection of Joel's reading when Joel's wife, Jill, asks her: *Was his blood pressure up a bit 'cause he looks a bit red?* Nurse Nelly (N3) admits she *can't remember no ….*

Following protocols and rules informs their working and knowing. If they do not know, nurses and doctors can reconstitute what they need to know either by following the protocol of reading the patient's notes first or via the protocol of checking with the patient themselves.

The framework in summary

The meta-framework provides a way of understanding of ED work based on what nurses and doctors *actually* do and say to manage the disciplinary and institutional exigencies of their work setting; rather than one based on the potentiality of their communicative abilities located in outdated notions of knowledge (transfer systems). Knowing (and communicating) instead are recognised as spatio-temporal dynamic and emergent phenomena collectively distributed among practitioners, technologies and objects.

What this means is that nurses and doctors in the ED operate in a nether world of vague-yet-informed knowing – a space that is both momentarily knowing and not knowing. They remake knowledge proximally; they predict and pre-empt knowledge; they have partial and distributed pieces of knowledge yet must always strive and appear to know. The ED is a *locus* of expertise, embodied in the 'epistemic authority' (Heritage & Raymond 2005) of medicine, doctors and nurses. Disciplinary knowledge is a central component of medicine in particular (Sheridan 1977) and a doctor's being (identity) is central to this knowledge or knowing. Knowing can be thought of as doing – thus the paradox of knowing and not knowing must be accomplished in real-time and space as nurses and doctors work.

The actions and activities as described interrogate the safety and quality of patient experiences as they too, like the practices, are 'bundled' with the ED's 'material arrangements' (Schatzki 2006). Jane Edna's consultation, for example, expends the time and effort of 22 clinicians and other hospital personnel, as it transpires over 11 hours 15 minutes and through 51 visits. When knowledge is understood as knowing, what happens spatially (Coiera *et al.* 2002; Fairbanks, Bisantz & Sunm 2007; Nugus 2007; Nugus & Braithwaite 2009; Woloshynowych *et al.* 2007) is significant; knowing involves informal learning relationships (Hunter & Scheinberg 2012; Long, Iedema & Lee 2007); and spatial (team communication) practices and patterns in EDs (Woloshynowych *et al.* 2007).

How can EDs continue to manage growing numbers of patients with co-morbidities in the current model of ED care if knowing needs to be recursively constituted and is so fragmented in one space? I see the sayings, doings and beings of clinical work identified in the meta-disciplinary and institutional framework, as highlighting the muddle and the uncertainties of enacting these in ways that are increasingly problematic. Engestrom warns that our interprofessional relationships are not yet ready for this new (de-centred and mobile) world of healthcare. In his words,

> the shape and implications of spatio-temporally distributed work and expertise are still fragile and open, literally under construction. When professionals perform such work and discourse, they also give shape to it (Engestrom 2008, p. 217.)

In this Engestrom alerts us to how nurses and doctors strive to work in an ordered way through the four kinds of practices always situated in the knowing/not knowing paradox. This as Hager points out is 'learning [that] is emergent from its context in unanticipated and unpredictable ways' (2011, p 23).

7.7.   Concluding comments to Chapter Seven

In Chapter Seven, I have argued that the meta-disciplinary and institutional framework of practices provides an alternative way of understanding ED work to that offered by conventional approaches addressing individual and team communication in the ED, approaches which I have argued are located in largely cognitively-derived paradigms of *in vacuo* hierarchical knowledge and professional relationships that can simply be negotiated/changed (Bleakley 2006; Finn 2008) 'at will' – post training – at local levels.

Through the framework I posited that doctors and nurses undertake particular doings, sayings and beings learned as practices – and which have prevailed into the ED. Here these are enacted in particular configurations to reconstitute their knowing at the bedside. I posited that the framework of ED practices is based on what nurses and doctors *actually* do and say to manage the disciplinary and institutional exigencies of their work setting.

I conclude that the practices as described, interrogate the safety and quality of patient experiences 'bundled' as they are with the ED's 'material arrangements' (Schatzki 2006), and are set up in ways that maintain the vested interests of medicine in particular. These interests maintain a model of work whose materiality (codified knowledge about patients, deteriorating bodies, objects, space and time, for example) and social dimensions (divided disciplinary practices and contested practice knowledges) are not fully comprehended in a site where analysis has shown they combine to dramatic effect for patients, nurses and doctors as well. The need to be near patients, talk to them, predict who they are and what they need and draw on rules and protocols at speed, raises questions about the sustainability of the current model of ED care – particularly if knowing needs to be recursively constituted and is so fragmented in one space.

To summarise, in Chapter Eight, I revisit the thesis argument, research questions, findings and implications that arise from the study and propose ways to consider the fragility of knowing in the ED, not as something that can be solved, but as something that can be understood better in its complexity.

Chapter Eight – Reframing ED work

Purpose and flow of this chapter

In Chapter Eight I bring together the findings of the study, the argument of the thesis and its contribution to ED work. In presenting a new meta-disciplinary, and institutional conceptualisation of knowing in practice in EDs, I reframe conventional approaches to addressing teamwork and interprofessional communication (as activities involved in information transfer) in EDs. I find that the identified repertoire of practices that nurses and doctors draw on in their daily work, provides an elaborated view of understanding ED work and thereby challenges research to date that has identified nurses and doctors as primarily individually responsible for communication, teamwork and knowledge transfer problems in EDs.

I outline how the thesis provides a methodological and theoretical contribution by describing full-length ED consultations using practice theory and linguistic ethnography analyses. I argue that the study crosses a number of research literatures – organisational learning, communication and teamwork (in health), and practice theory. This affords a novel, empirical exemplar of the interconnectedness of professional practice, communication, teamwork and organisational learning in ED care.

I conclude that the thesis extends research into organisational learning in healthcare contexts based on empirical data. These data have enabled a deeper understanding of the meta-disciplinary and institutional framework of practices: one that captures the individual/collective, emergent/teleological and knowing/not knowing aspects of practice. These paradoxes, which are on a continuum rather than a binary opposition, remind us that organisational learning and practice ought to be understood not reductively, but as complex phenomena (Hager 2011). This complexity has illustrated the fragility of practice, the muddling through that nurses and doctors have learned to enact in this setting.

8.1.   The argument

Conventionally, a large component of healthcare research on critical incidents and safety has focused on individuals – on their communication, their teamwork, their individual skills and their handover protocols. It is they who have been expected to manage important

medical knowledge (or information leading to knowledge and knowing) – as a stable 'virtue' (Yamauchi 2006) – for, and between, themselves as a cognitive 'possession' as they work in the ED.

The overall argument of my thesis has challenged the primacy of cognition in knowing: I have posited that instead of seeing the organisation of doctors' and nurses' work in the ED based on knowledge as a fixed, cognitive possession, knowledge should be understood as an emergent, situated, socio-material activity, i.e. site-specific knowing. The conventional approach, I have argued, separates knowledge from the activities and actions of what knowers do. It isolates knowing from the relational and material aspects of work – how nurses and doctor do knowledge, in the social, spatial and historical setting of the ED, i.e. through practising.

I have presented knowing as an activity embedded in the socio-material, relational and spatio-temporal praxis of ED work, arguing against information transfer and communication as instrumental standalone or privileged components of ED work. I have illustrated that codified details of patients, while primary to ED care, are transferred, accessed and worked with, not in primary ways through straightforward linear processes (such as in handovers), but in secondary (even underground) ways. As details are used to inform knowing, this occurs in practice through individual, collective, recuperative and iterative sayings and doings that layer objects, people, space and time through activity: as knowing.

I have therefore examined practice in its complexity, and taken into account space, time, people, power, communication and material arrangements – and the way nurses and doctors work with codified and pre-codic patient knowledge – and I have explored how these together all impact on and manifest knowing. I have taken account of how nurses and doctors know bodily (through discursive sayings, touch, feel, etc.) (Strati 2003, 2007); how they know through iterative information checking; how they know through attachment to their professional practice knowledges (Reckwitz 2002; Schatzki 2009); and how they know by reconstituting and re-enacting their knowing incidentally and collectively (Orlikowski 2002). By examining knowing as a distributed and collective undertaking, I have illustrated that knowing relies on more than the transfer of codified knowledge and its associated instrumental, so-called effective communicative processes: it is a complex,

situated, emergent and networked practice (Bruni, Gherardi & Parolin 2007; Gherardi 2006, 2008, 2009; Nicolini 2011; Nicolini *et al.* 2008).

I have also presented empirical data illustrating that neither information transfer in handovers or collaborative communication in isolation, while very important, serve as reliable and secure ways to understand how nurses and doctors know in practice. Instead, information transfer and collaborative communication are now understood as components of practice that trigger and reflect negotiated and idiosyncratic understandings of what is transferred (for example, in handovers), disciplinary interests, space, time and institutional and material arrangements.

I have presented findings based on data that show that neither knowledge nor knowing is fixed. Data have also shown that learning, working and knowing are disciplinary-, institutional- and practice-based. As such, my focus has highlighted practices as the site of knowing/doing (Nicolini 2011) and not individuals as knowers/doers. This shifts the focus from individuals – on what they *know and do* – to practices. These are practices that have prevailed from standard medical interviews into the ED setting, where they have been adapted to the site. Through their persistence in the ED and through the analysis on their working, learning and knowing, I have argued that nurses and doctors are attached to their practices and their practice knowledges (Gherardi 2012; Reckwitz 2002; Schatzki 2009). I have illustrated that understandings are ephemeral and idiosyncratic, rendering knowing as fragile and capricious. Yet through practising, and reconstituting knowing, a collective safety is achieved.

What this means for understanding ED work differently is a need to rethink the focus of research in the ED. Currently, viewing knowledge as a possession rather than an activity renders team communication and handover processes as informational events in which codified medical knowledge is reified, seen as located in assumed stable forms of clinical evidence that are known, transferred and universally applied *in situ*. This model places a heavy reliance on optimal communication and teamwork between nurses and doctors to mutually know and transfer this knowledge, intact and in time. This model also underemphasises the contribution of knowing (or not knowing) in the ED timespace, where teleologies of divided practice knowledges co-exist, i.e. disciplinary divisions that nurses and doctors are attached to, and have been thus, over time. It does not adequately take account of the way that disciplinary, institutional and material arrangements constrain

or set up particular possibilities for action; how individuals learn (practices), how their doings, sayings and beings draw on disciplinary knowledges; how their actions might be resisted, accommodated (Pickering 1993), and/or mediated by the objects, space and people (Schatzki 2006), including vested interests (Nicolini 2011) and bio-materialities (Schatzki 2010) in the ED.

Finally, instead of foregrounding stable, intact views of clinical (largely medical) and possessed evidence as the presiding paradigm of work, the thesis has focused on practising as the overriding paradigm of work. Analysis has demonstrated the idiosyncratic nature of knowledge and the fluid nature of knowing. In presenting a heuristic framework of practices that nurses and doctors draw on to practise knowing, the study has placed a spotlight on the practice space of the bedside, where idiocentric doings and sayings, collectively enacted, unfold as nurses and doctors reconstitute their knowing.

ED work has been presented as a site of knowing and not knowing – a focus which addresses knowing as a multiplicitous resource embedded in people, space, language, material and knowledge objects, and in the doings, sayings and beings of nurses and doctors engaged in work practices. Based on the findings of the study and theoretical approaches that investigate knowledge and knowing I conclude that knowing is continually mediated by individual, disciplinary and institutional exigencies. Nurses and doctors continually draw on learning and practice teleologies and seek to respond proactively – through practising knowing – to spatio-temporal and material contingencies (including a substantial amount of codified knowledge about patients). Their doings and sayings blur safety and unsafety (Jerak-Zuiderent 2012) as paradoxical actions and activities: they practise knowing. I argue that existing research in healthcare contexts has paid insufficient attention to what is involved in practice: the multiplicity of knowing/not knowing enacted through activity. The analysis from this thesis shows, as Greenhalgh *et al.* found in their literature review of Electronic Patient Record (EPR) research, that

> collaborative clinical work involves the ordering and coordination of tasks, which requires the real-time processing of local information. [Electronic patient record studies] have shown that clinical knowledge is often tacit, context bound, and ephemeral rather than codifiable, transferable, and enduring (Greenhalgh *et al.* 2009, p 754).

In such storage systems a 'patient's condition and journey comprise a single *reality* to be represented in the EPR' (Greenhalgh 2009, p. 760). This reduces the knowing about the

patient to 'a single ideal and 'agreeable' form' of the illness/injury/health status at any one point in time. In this way, 'the [...] underlying *reality* represented by the record is generally considered to be unitary, context free, and unproblematic' (Greenhalgh 2009, p. 760).

The study proposes that the disciplinary and institutional exigencies, their bearing on how, and amid which, nurses and doctors reconstitute their knowing (at the bedside) prior to action, offer a *new locus* for, and approach to, researching safety in ED work.

Revisiting the research questions

The research questions that have been addressed are:

1.   What are the disciplinary and institutional complexities of learning, working and knowing in modern emergency departments?
2.   How do doctors and nurses know in practice?

To address these questions, in an integrated way, three interconnected sets of data have illustrated the disciplinary and institutional complexities of working, learning and knowing in modern ED care. I have described how nurses and doctors practise knowing – I have given a practice-based account of how they go about managing not knowing in the ED. As nurses and doctors work, I posit that they draw on practices developed in standard medical interviews, which have been *institutionalised* in the ED consultation (Fischer & Ereaut 2012). In the ED, they enact these practices in concentrated patterns of work (idiocentric interactions with patients), a site characterised by not knowing, yet one in which nurses and doctors must demonstrate expert knowing. To resolve or reconcile this paradox, nurses and doctors manage knowing and not knowing, through what I term 'practising knowing'.

The ED as an organisation has also been described, ethnographically, as a place where nurses and doctors learn, practise and (re)produce ED knowledge amid uncertainty and complexity.

The thesis contributes to a different understanding of organisational work in EDs – knowing in practice – by firstly:

• reframing conventional approaches to addressing teamwork and interprofessional communication in EDs;

• introducing a meta-disciplinary and institutional framework of practice in EDs that shows how nurses and doctors practise knowing and manage not knowing in the ED;

- extending understandings of the fragility of knowing and not knowing (in practice), describing how nurses and doctors manage the impermanence, contingency and predictiveness of their work. The ED context might be considered as a microcosm of how knowing implicates practice – what it means to keep up with (and stay on top of) increasing information loads, to work in competitive knowledge environments, to communicate in fast feedback scenarios (Crawford & Brown 2011) etc., as a feature of 'liquid modernity' (Bauman 2006) in organisational settings.

Secondly, the thesis provides a methodological contribution by describing full-length ED consultations using practice theory and linguistic ethnography analyses. The study writes across a number of research literatures – organisational learning, healthcare communication and healthcare teamwork. The study also provides comprehensive empirical data of how learning, practising and knowing in practice occurs in this setting.

8.2. Reframing conventional approaches to addressing teamwork and interprofessional communication in EDs

In the information-rich setting of the ED, patient and collegiate details are remembered and/or forgotten (Talbot & Bleetman 2007); transferred and/or not transferred; contested, lost and found, particularly in the unique space and setting of the ED. Nurses and doctors work with the materialities of codified knowledge about patients (in notes, X-rays, whiteboards, etc.) as their doings and sayings unfold in the complexity to ED work. Knowledge as object is not a fixed item embedded in a work activity, such as a handover. As a consequence, nurses and doctors are in a constant state of flux between knowing and not knowing. In this, the data have shown that knowing itself does not exist as an entity – in systems, in patient records, in people's minds – but it is continually enacted in everyday practice in moments – 'its [knowing] existence is virtual, its status provisional' (Orlikowski 2002, p. 253).

A practice theory view of work in the ED re-distributes *cause* and *effect* around some of the factors conventionally seen as having a bearing on safety – particularly the focus on individuals and strictly-followed protocols as being primarily responsible for effective and safe communicative, interprofessional teamwork and information transfer potentialities. As different disciplinary actions and activities unfold

in [this] scene[ ] of action, there is a vast repertoire of knowing in practice that is silenced and automatically excluded by the conditions of possibility generated by the extant regime of engagement and accountability (Nicolini 2011, p. 613).

In the current model of care, the 'extant regime of engagement and accountability' in the ED implicates individual doctors and nurses. The study proposes that individual nurses' and doctors' actions and activities are carried out by them through practices that are themselves embedded in the larger nexuses of medical and nursing paradigms. Ways of communicating and working as a team are not merely manifestations of individual capabilities, experiences and desires. Disciplinarily, nurses' and doctors' responsibilities, accountabilities, 'their wants and emotions, do not belong to [them as] individuals but – in the form of knowledge – to [their] practices' (Reckwitz 2002, p. 254).

Practices reflect prefigured opportunities for action afforded by each of the disciplines, and the organizational memory made up of the sum of the ED's practice memories. These practice memories belong to nurses and doctors. Seeing them as carriers of their practices shifts the understanding of practising and knowing to one that foregrounds the processes that weave together their doings over merely what they know cognitively (and bodily) at any one time. This 'posits a primary of practice over knowing' and subverts the traditional views of Cartesian knowledge, on which healthcare is still largely based, where 'knowing starts with a subject facing an object, [and requires] practice and practical coping' (Nicolini 2011, p. 604).

In situ, the analysis has shown that nurses' and doctors' individual and collective practices are part of a complex network of perpetuated individual and collective knowledges – enacted in doings, sayings and beings – all of which set up recalibrations to care. Nurses and doctors have developed ways to harness and use the widely dispersed, unreliable and ever-changing bits of information (knowledge as object) that 'do epistemic work' (Cook & Brown 1999, p. 386) to know in practice; they have found ways to revise and use knowledge, i.e. resource their knowing, by reconstituting what they need to know and do with patients at the moment they need to know it and enact action. In that moment they rehearse and revise details with patients – in some cases discovering things for the first time – so that new knowledge can be incorporated 'into a coherent and meaningful diagnostic frame' (Nicolini 2011, p. 615) at the point of action. This moment is that in which 'the incoming physician should review the medical record, interview and examine

the patient, and document the status of the patient at the time of the transfer' (Singer & Dean 2006, p. 753).

And this is a moment that requires further investigation, as it is multiplicitous and complex: there is knowing and not knowing.

Currently, the organisation of doctors' and nurses' work in the ED is premised on a model of knowledge transfer, in which information is static, communication can be improved by taming noise and interruptions, controlling communication mediums (i.e. using pagers, improving lighting, coordinating through others, using cell phones etc. (Welch *et al.* 2013)), rather than on a model of practising/knowing. The former sees knowledge as a contained, fixed 'virtue' (Yamauchi 2006), with a focus on the reliability of the message system between individual communicators, their teamwork and handover protocols that will secure codified patient details. The analysis has shown that this transfer model relies on an understanding of knowledge as cognitive, unitary and stable. This view, as a consequence, places a reliance on memory, on concentration, on synchronous, positive collegiate relations and on exact and congruent mutual understandings of particular forms of evidence/knowledge.

To date, research on 'information transfer' in healthcare and in EDs has focused on what transpires with an emphasis on cognitive and protocol-based processes, i.e. what is done and said in handovers, and how this is done and said (Cohen & Hilligoss 2010). This is despite the problems identified with handovers as reliable, functional processes of information transfer (Singer & Dean 2006). Handovers have been referred to as 'brittle moment of transition – in the confusing interstitial space between individual and collective responsibility – [and one in which] critical errors occur' (Mukherjee in Singer & Dean 2006, p. 752).

The actions of many nurses and doctors during and after the handover underscore the ritual nature of this process (depending on the type of handover). For example, nurses and doctors might move in and out of the audible handover space, and they may pay little attention to the speaker (often this is an inexperienced junior with limited cohesion, confidence and coherence in handing over). Following this, the new nurse or doctor looking after the patient proceeds to reconstitute his or her knowing in various ways, either reading the notes, talking to the patient or colleagues, chasing up pathology results or X-rays. The significance of the handover, I argue, resides in it being the first stage of knowing

as activity, a boundary point, rather than a point at which undifferentiated, static, exact information transfer takes place. Yet, the handover as a key networking activity is still premised on the idea that 'knowledge is transferred and in the process of being transferred remains identical' (Gherardi 2006, p. 191).

The concepts of practice and knowledge presented in the study have drawn on aspects of a social practice view of knowledge. Knowledge and knowing are entangled in a set of practices that are socially shared, collectively learned and embodied. Findings have shown that neither knowledge nor knowing is defined and self-contained: there are few context-free facts that can be easily 'possessed' by, or transferred between, people and or computers (Brown & Duguid 2001; Gherardi 2008; Lave & Wenger 1991; Singer & Dean 2006). Instead, knowing has been illustrated as a situated, collective, timespace activity that must be enacted through the unfolding of performances of individual and separate activities and actions (Schatzki 2006, 2009). This paradox explains in some small measure why one patient with multiple carers, at the receiving end of multiple actions in each clinician's repertoire of activities – 'one event in a flow' (Hak 1999, p. 433) – and at the centre of a multiply-utilised and multiply-populated space, will find him or herself at the centre of '[ ]interrupted chains of translation' (Nicolini 2011, p. 615).

This study has illustrated, along with others, that the expectation of multiple 'floating facts' being transferred unproblematically (Greenhalgh *et al.* 2009) from one stage of the ED consultation to the next, or even in one stage, or from one person to another, should not be depended upon as a consistent and reliable model of care in practice. Knowing instead has been shown to involve a multidimensional and continually renewable process that requires constant remaking by individual nurses and doctors.

Where patient details are, geographically dispersed or lost; how they are attended to; contested; challenged; ignored; packaged, etc., is simultaneously a feature of the real-time and space nature of ED work as well as the metaphorical timespaces – the social and historical complexities of the relationships between doctors and nurses. Their individual and group timespaces – beliefs, desires and motivations – reflect conflicting teleoaffective origins and goals. It is they who constantly need to *negotiate* with each other, and weave together dispersed knowings (Nicolini 2011) through activities, through discursive and artefactual means, as they enact doings, sayings and beings *in situ*.

Knowing and not knowing have a material bearing on the care of patients, in other words, on critical work in the ED. As they work, nurses and doctors need to individually and collectively weave together what is known about patients and the team, and what is not known. They have learned to practise knowing. By focusing on how knowing is constituted and reconstituted through *extra-individual* practices (Kemmis 2009) beyond and at the bedside, both the vulnerability and robustness of patient safety in the ED are brought to the fore – a paradox that temporarily reassures, but ultimately challenges, the existing (and increasingly stretched) model of ED care and its epistemological and institutional structuring. As codified patient details are unstable and multiple, and knowing is relational and emergent, and as understandings are not definite, contained nor mutually agreed, nurses and doctors have learned to finesse their knowing – they practise, or perform, knowing. In talk with patients, they draw on a repertoire of doings, sayings and beings – a repertoire that recognises the fragility of knowing, and of so-called fixed patient and team details in the ED. These knowledge practices 'emerge, are sustained, [and] become enduring' (Gherardi 2006, p. 194).

Currently, the efforts of research and policy endeavours are principally directed at improving clinicians' individual practices by introducing more detailed, codified, protocol-driven solutions, such as those suggested in ongoing handover research (Cohen & Hilligoss 2010; Singer & Dean 2006). Although clinical redesign is a top priority of healthcare services in Australia and abroad (Bate & Robert 2006; Bate & Robert 2007; National Health and Hospitals Reform Commission 2009; NSW Department of Health 2005; South Eastern Sydney and Illawarra Health Service 2006), organisational changes are likely to be slow and incremental. According to Schatzki (2011), the open-endedness and capacity of a practice to be differently executed the next time it is done (Schatzki 2011) provides some opportunities for change. There is always the *potential* for practices to be different. However, even though change and stability are inherent in practices and practising, practice

> understandings and repertoires tend toward inertia; indeed, their inertia is crucial
> to the pervasive persistence of bundles, a conservatism inherent to social life. This
> conservatism is all the more extensive given that the same practical understandings
> and bodily repertoires can underlie multiple bundles (Schatzki 2011, p. 20).

8.3.   Introducing a meta-disciplinary and institutional framework of practices in EDs

The data indicate that (learning) practices enacted in ED consultations concurrently embraces paradoxes that move beyond understanding workplace learning as a mono dimensional phenomenon: practices are individual and collective; practices are emergent and teleological; and practices involve knowing and not knowing. The thesis posits that nurses and doctors have learnt to enact medical and nursing practices, in particular configurations, in the ED setting. These practices, extant in other healthcare contexts, have prevailed in the ED. Nurses and doctors bring existing practice knowledges into the ED (old learnings), and then tailor them to the ED context (new workplace learnings). These paradoxes are examined through the analysis. A Schatzkian perspective sheds light on how practices that have prevailed from other settings into the institutional setting of the ED. There they have been adapted and are enacted individually, and by implication collectively, to manage the uncertainty, contingency and indeterminacy of knowing in the ED.

As a result of the identification of the frequency and nature of sequential interactions, the study contributes in some measure to a deeper understanding of the way practising is done in the ED. The number of sequential visits to patients' bedsides – where doings, sayings and beings are repetitively and reparatively enacted – throughout an entire consultation highlights how mobility, disciplinarity, interactivity, repair and organising are interconnected. Through an examination of the timespace of the ED, its epistemological framework and its unique institutional exigencies, I have identified particular configurations of proximal, protocol or rule-governed, pre-emptive and predictive and prefigured participatory practices – common to all healthcare but accentuated in the ED – which I argue assist us to understand how nurses and doctors work to constitute and reconstitute their knowing.

This framework provides a mechanism for beginning to understand how nurses and doctors manage the indeterminacy of knowing, which they enact in specific configurations in the ED. Proximal, participatory, predictive/pre-emptive and protocol or rule-governed practices allow nurses and doctors a discursive and clinical space in which to constitute and reconstitute their knowing. If they have not had time to read the notes, or speak to colleagues, and even if they have done so, each face-to-face encounter with the patient has

the potential to be a moment of discovery and a (dis)confirmation of knowing. The face-to-face encounter also presents a third possibility – it is also the moment when an error can occur. If nurses and doctors misunderstand details and/or do not transfer them accurately or adequately, and knowing is not reconstituted from what is said or passed on, the doings and sayings that transpire in this conjoined moment, illustrate, if not the actual, then the potential of how errors (might) occur. This is evident with Nurse Janita (N2) who does not find out what is wrong with Joel from the ambulance officers and as a consequence, harms him.

By focusing on what happens in the moment of practice rather than what transpires before (communicatively) will address one of the shortfalls that Singer & Dean identify in current handover research, i.e. that 'posttransfer activities' (2006, p. 753) are significant and require attention. Nurses' and doctors' actions and activities as they (re)constitute their knowing blur the boundaries between safety and unsafety (Jerak-Zuiderent 2012) – through actions, safety and unsafety are blurred – they are not separate phenomena. They merge, in activity, as complementary sides of doings, sayings and beings, of practices. Safety is no longer fixed, but also unfolds in practice as 'stor[ies] of mess and multiplicities' (Hor 2011) rather than as stable, settled ways of working.

The patterns of visits to bedsides and the way nurses and doctors collectively use this moment to reconstitute their knowing illuminates specific aspects of knowing and not knowing. If nurses and doctors do not rely solely on handover data (if they do so at all); when they check with patients (and with each other) on what they (think they) know; when they remind themselves where they are up to; when they re-question; when they ask assumptive questions and make pre-emptive statements – what do their post handover activities reveal about the elements of the story that are missing, and or the actions that are enacted? Is it personal (and interpersonal) details about the patient such as shown in the name sagas with Jane Edna and Joel? Is it procedural information about what has been done to or for the patient, as in the example of the urine sample? Is it medical or nursing knowledge, i.e. clinical information that needs to be followed up on, or checked, e.g. allergies? Is the moment of interaction with the patient merely duplicated chat with the patient on a matter that another nurse or doctor has already conducted, e.g. the list of medications? These are all safety and quality issues for patients and the system.

Conversely, if nurses and doctors do not (re)read notes, if they do not repetitively check details, if they do not re-question patients, and if they do not reconstitute their knowing at the point of action, then by default, they rely increasingly on memory, on cognitive framings of work and knowledge, and on the supposed doings and sayings of others. Therefore, proximal, protocol or rule-governed, pre-emptive and predictive and prefigured participatory practices go some way to mitigating the consequences of not knowing. Paradoxically however they sometimes cause not knowing. As these practices have a direct bearing on patient experiences and their safety in ED care, the study proposes that the disciplinary and institutional exigencies, their bearing on how, and amid which, nurses and doctors reconstitute their knowing (at the bedside) prior to action, offer a *new locus* for researching safety in ED work.

8.4. Extending understandings of knowing in practice in complex settings: the fragility of knowing

'Knowing in practice' (Gherardi 2008) and practice structurings (Schatzki 2006) focus on the indivisibility – or equivalence – of knowledge and action: if one knows in practice, one operates competently, taking all the knowledges in the environment into account (Gherardi 2008).

However, knowing in practice as a practical accomplishment, and knowing as a capability is enacted by practitioners who participate in the complex web of material artefacts, relationships among people, and activities in a setting (Gherardi 2001). But the analyses have shown that practising might also be thought of as a multiplicity, where doing and knowing may be thought of as interpolated – connected but increasingly stretched apart from each other as nurses and doctors vacillate between knowing and not knowing. Nurses' and doctors' practices in the ED challenge the notion of knowledge 'embedded in practice' [where] doing and knowing are one and the same' (Gherardi 2006, p. xii) as their practising involves knowing and not knowing.

Although Schatzki has shifted over time in his theorisations of the make-up of practices, – see for example his early work (Schatzki 2001b) – for him, there remain practical understandings, general understandings, rules and protocols and teleoaffective underpinnings that underpin actions (Schatzki 2006). But what happens when practical and general understandings, or teleoaffective structurings themselves alter and shift from

moment to moment and at speed or are incorrect; when information sources are updated (or should be) continually; when interpersonal relationships and work are increasingly complex, discontinuous and uncertain? In these instances, knowing – its activities and actions – is fragile, contingent and fleeting and knowing needs to be ahead of itself, i.e. predictive, adaptive and reparative.

The data from the ED have shown a microcosm of how nurses and doctors manage the intensity, the gamesmanship, the adaptivity, the treading of water, the struggle to stay ahead, or abreast of what is 'known' and 'real' that is increasingly becoming a part of knowing or not knowing (in practice) in fast moving contexts of work (Czarniawska 2013).

The data have strengthened understandings of how knowledge and knowing are not fixed, stable virtues (Yamauchi 2006) but have contributed further understandings of how workers 'go on' or 'muddle through' (Lindblom 1959) as nurses and doctors in the ED must – in this very complex environment, especially when they do not know. The data analysis and the meta-disciplinary and institutional framework of practices have illustrated new understandings of, or new ways of thinking about, how knowing and doing and their relationship to each other are increasingly stretched in spatio-temporal and communicative ways. In the ED knowing and not knowing are co-present; doctors, nurses and patients comply with and resist each other's practice and experiential knowledges; work, learning and knowing are collective and individual and they are also emergent and historically-embedded (Manidis & Scheeres 2013). As time and space conflate in the ED's timespace the nuances and fluidity of knowing alter and mutate from moment to moment, through sayings and doings that are flexible, resourceful and predictive: practice is precarious and knowing in practice embeds not knowing.

By focusing on the performances of nurses' and doctors' actions (their sayings, doings and beings) in the context of the multiple materialities of ED care – time, space, changing information about patients, declining bodies, multiple carers – as well as on the substantiveness (and evident unreliability) of informational materialities such as those conveyed in handovers, a different world of work emerges; one characterised by complexity, emergence and even fabrication (previously mentioned in example 24, Table 15):

> And I think other people write their notes, not that they're sort of lying but they want their notes to fit a picture so actually they'll write something that's not quite actually as it happened. (Interview data: ED senior registrar 08072008)

These findings add to more recent concepualisations of collective learning (Hager & Johnsson 2012) reflected in workers recognising the presence and actions of others in emerging work situations. Hager and Johnsson identify collective learning as going 'beyond participation to include judgement; [collective learning] requires an embodied, committed form of relational responsivity that implicates others who must be similarly committed' (Hager & Johnsson 2012, p. 262). In the nature of the idiocentric visits to patients' bedsides, this 'relational responsivity', i.e. the *collective* part of collective learning, is not absent but is lessened, as each nurse and doctor approaches Jane Edna and Joel on terms that reflect their particular doings and sayings as isolates – a one-off in the journey of the consultation – with these suggesting little control over what might have been done before (will be done later) by others. While an individual nurse or a doctor is interested in whether (and aware of) the (other) doctor has been, or whether the (other) nurse has come with the medication, the overriding responsibility, concern and orientation of each visit is clinician-patient, not clinician-patient-clinician(other) focused. This pre-occupation with the individual doing/saying/being, focusing on the patient-clinician relationship, is possibly an outcome of the medico-legal underpinning of work and actions in healthcare, where each nurse or doctor is responsible (and accountable) for what transpires between him or her and the patient. Alternatively, this unitary focus is a manifestation of the fragmentation of disciplinary practice in the ED – where 'relational responsivity' to others is too complex to be engaged in, or to be done in concert with others, because of the pace of work, the number of clinicians involved, the speed of disease progression and/or difficulties in responding to each other because of the materiality of time, space, declining bodies, missing notes and so on; where care is too complex to be orchestrated collectively. Idiocentric visits manifest as an activity in which actions are only sparsely co-ordinated with those of other practitioners, yet they are collectively practised. This activity entrenches the silo-ed nature of learning, working and knowing in the ED, and suggests a problematic way of coping in the working and learning model of EDs: in the tempo-rhythm (Johnsson 2012) of ED work, everyone is marching, but largely to the beat of their own drum.

8.5.   Contributing a new analytical framework for investigating ED work

This thesis is the first to closely examine patients throughout an entire ED consultation and examine what is going on there (Silverman 2010) from a practice theory as well as a linguistic ethnographic perspective. The development of:

- the practice/LE matrix;
- the meta-disciplinary and institutional framework; and
- the focus on a full ED consultation

have afforded an opportunity to observe how knowing – or (re)producing ED healthcare knowledge – is done in the timespace of the ED.

The thesis contributes to the field of healthcare practice research. Findings have illustrated the way language, knowledge, organisational constraints, space and disciplinary activities are comingled; how discursive and clinical practices are enacted in everyday work; how mobile clinicians are in EDs; how practices are bundled with material arrangements and how institutional factors like staffing, rostering, models of care, etc. shape and are shaped by interactions and clinician-clinician and patient-clinician relationships in the ED. Importantly, the findings have shown how knowing so distinctively reflects the site ontology of the ED and its 'specific configuration of interests' (Nicolini 2011, p. 616). Ultimately Schatzki's notion explicates that human activity, through practices, 'implicates a world amid and with which it proceeds' (Schatzki 2002, p. 106).

Idiocentric interactions, i.e. nurses' and doctors' sayings, illustrate how knowledge about patients is constantly remade *in situ* and *in actu*; how knowing is accomplished by each nurse and doctor; and how these iterative interactions increase patients' frustration and confusion in the ED. The combination of practice theory and ethnographic and linguistic ethnographic approaches have afforded a meta-disciplinary and institutional framework that captures how nurses and doctors have learned to practise in this context, to know (and not know) in practice.

I have constructed an argument throughout which has sought to show that examining the practices of nurses and doctors means 'inherently examin[ing] an instance … of knowing' (Nicolini 2011, p. 603). The activities of nurses and doctors are interconnected with each other and therefore 'the actual site of knowing is not any practice in particular but is a nexus of interconnected practices' (Nicolini 2011, p. 603). Here, knowledgeability links practising and knowing as 'reciprocally constitutive' (Savolainen 2009) and it is a term Giddens defined as the ability 'to go on with the routines of social life' (Giddens 1984, p. 4 in Savolainen 2009, p. 7). Nurses' and doctors' actions, and their everyday activity in the ED, are knowledgeable – knowledge is not something outside of them (Orlikowski 2001, pp. 250-253 in Orlikowski 2002).

Through descriptions of the relationships between the practices of nurses and doctors, the way the practices and knowledgeability can be 'translated and tentatively reproduced elsewhere in time and space' (Nicolini 2011, p. 615) – including in other times and other spaces in the ED, in radiology, at the bedside, in pathology and beyond, with GPs, specialists, other hospitals, ambulances, etc. – I have come to understand that 'the site of knowing is … the overall pattern of activities and their connections. It is the net of actions taken in its living and pulsating entirety' (Nicolini 2011, p. 615).

It has been made clear how these nets – or what Schatzki terms 'nexuses', what Gherardi calls 'action-nets' (Gherardi 2009), are arrangements – in that 'they have a specific and consequential form, internal organisation, and pattern' (Nicolini 2011, p. 615). Organisationally in the ED and in healthcare more generally, and in the structuring of the ED model of care, these arrangements stem from the historical structure of medical interviews, a particular expert-lay relationship – patient to clinician. Moreover, the professional histories of nurses and doctors working together and their respective roles has resulted in the current ED model of care with its hierarchies, established disciplinary tasks – what Nicolini terms a particular 'interest-led projectuality' (Nicolini 2011, p. 615) of certain professionals in the field.

The findings are useful to clinicians, patients, hospital managers and patient advocacy groups as they add insights into the role of patients as potential team carers in Australian EDs, assisting to better understand the epistemologies of learning and work (Brown & Duguid 2001; Lave & Wenger 1991) that form the basis of professional formation in healthcare contexts (Kilminster *et al.* 2010; Manidis & Scheeres 2012) and the possibilities for better understandings of knowing in practice. Educational support or training recommendations for managing work in the ED that arise from these findings will be addressed elsewhere.

8.6.   Epistemology and practice – going forward

While harmonious healthcare and interprofessional work is a national (Dunston, Lee, Boud, *et al.* 2009; Matthews *et al.* 2011) and international policy ideal (World Health Organization 2010), despite the unique opportunities afforded by the ED for doctors and nurses to work together as a team, the study finds a complex picture of practice. The meta-disciplinary and institutional framework of practices has exposed the absence of synergistic

'team' outcomes, i.e. team knowledge as possession in ED consultations, with potential risks to patient safety. It has illustrated how knowledge is activity: activity that is done relationally, *in situ*, and ongoingly. It has also provided a new way of understanding ED work.

As nurses' and doctors' practices continue collectively and individually in predominantly face-to-face encounters, as they enact idiocentric activities, these highlight that not knowing (as possession) is continuous in the ED. As work in the ED unfolds in micro interactive and activity-based sequences, nurses and doctors must re-engage to resource their knowing. And because each 're-engagement' is a separate event (Schatzki 2011), it isolates each working and knowing action from the next. These re-engagements always create a context of knowing/not knowing simultaneously.

But this is knowledge understood as activity. Instead of expecting nurses and doctors to achieve team knowledge (as possession) through collaborative and collegiate working advocated in current healthcare policies and critical incident recommendations, it may be more useful to understand the complexity of how knowledge is done as activity. In this latter paradigm, it is possible to see how knowledge is an ongoing accomplishment – 'constituted and reconstituted every day [and every time] in practice' (Orlikowski 2002, p. 269). Practices are re-enacted by individual practitioners collectively: in a system where disciplinary and institutional opportunities for action largely afford segmented interactions – a linear model, premised on knowledge as possession.

The analysis has underscored the ongoing teleoaffective attachment of nurses and doctors to their 'bodily repertoires' (Schatzki 2011, p. 20), that have prevailed in the ED setting from other healthcare contexts, enacted in their proximal and participatory doings, sayings and beings. These along with the 'practical understandings' (Schatzki 2001b, 2006) that guide their work, such as rules, protocols and pre-emptive sayings, doings and beings, are likely to persist. In the same way, the sectors' views on privileging medical knowledge as a possessed entity is likely to remain as more highly valued than other knowledges, i.e. nursing knowledge (Liaschenko & Fisher 1999), or patients' experiential knowledge (Dunston, Lee, Boud, *et al.* 2009; Neal & McKenzie 2010; Stewart *et al.* 2000). The epistemology of knowledge possession is favoured over the epistemology of knowing as it maintains the *status quo* of hierarchies in practice.

In the ED, nurses' and doctors' 'real time practices and their relationship and attachment to their practices, [are the ways] in which, and through which, knowing manifests itself' (Nicolini 2011, p. 616). Importantly, these are ways of knowing maintained by particular bodies of professional knowledge and their associated discourses, practices and vested interests. These doings, sayings and beings have prevailed from other healthcare contexts within the larger nexuses of medicine and nursing and allow them to 'go on' with the routines of [ED] life' (Giddens 1984, p. 4 in Savolainen 2009, p. 7).

8.7.   Conclusion

I conclude that the current model of care in the ED entrenches practices and systems that favour certain groups' understandings of knowledge as something that is hierarchical, possessed and therefore a transferable, neutral and fixed commodity. The data have shown that *in vacuo* knowledge is consistently challenged by the requirements of *in situ* doings – which paradoxically must combine both theory and practice – as knowing is doing. The information-rich setting of the ED further complicates doing as '[m]odern healthcare professionals have to resolve an 'information paradox; they are overwhelmed with information but cannot find particular information when and where they need it' (Gray & Lusignan 1999 in Nicolini *et al.* 2008, p. 249). This paradox is ongoing as more recent studies confirm: 'ED care providers encounter both information overload and information scarcity' (Paul & Reddy 2010b, p. 4). Both these statements, however, underline the critical difference posited by the thesis: not knowing characterises the ED, but knowledge (and knowing) are activity, knowledge is not merely information.

I propose that the focus of attention by research and health services could be redirected to how knowing is done, rather than on models of care that privilege particular, i.e. *in vacuo* medical, knowledge. These latter models of care emphasise ownership and control of particular skill sets by individual practitioners, i.e. they are good communicators, or good team workers. These models also reify decontextualised knowledge-transfer systems, such as protocol-based handover practices and aids, such as electronic patient records. I propose instead that attention should be on *why* and *how* nurses and doctors continually reconstitute their knowing at the bedside (and elsewhere), as this is a critical site of how knowing (about patients) is done. The moment just prior to, and the moment they engage with patients, is the moment in which safe/unsafe practice is enacted.

The *why* and *how* of nurses' and doctors' practices, and the situated moments in which they continually constitute and then reconstitute their knowing, rather than relying on colleagues, technologies, memory, etc., point not necessarily to solutions. But they point to a deeper understanding of the complexity of the one-on-one, diasomatic relationship of medical and nursing practices with patients and particularly of how knowing in practice is done in the ED. These moments reveal the opportunities for action afforded to nurses and doctors by the disciplinary and institutional structures. These moments capture how nurses and doctors manage the indeterminacy of knowing in the ED through learned and adapted practices. But enacting these, iteratively and speculatively, as the data have shown, impacts on the quality of patients' experiences in the ED and what requires attention is a rethink of how the linear order of care is organised.

When it comes to *Practising knowing in emergency departments* the title of this thesis, tensions between the multiple understandings of knowledge are likely to be ongoing in the ED. As the organisation of care is now set up and maintained 'by practice and organizational memories' (Schatzki 2006), established in larger nexuses of practice in medicine and nursing, the complexities of addressing knowing and not knowing are likely to continue.

What can be achieved is to better understand the different understandings of knowledge and how practices and material arrangements organise action (Cook & Brown 1999; Schatzki 2006). This in the first instance would involve a shift from seeing the ED as a site where each clinician as an *individual* is solely accountable for being a communicatively effective nurse or doctor or not; a team player or not; to a site where institutional and disciplinary constraints and paradigms, and practices, are seen as contributing to the complexity of how knowing is done. Understanding knowledge as knowing also emphasises the non-linearity of how knowing is enacted in iterative, non-linear, disconnected and 'mangled' (Pickering 1993) ways.

Considering changes to the healthcare sector's view of what goes on in EDs will involve rethinking conventional approaches to healthcare knowledges, practices and multiple research trajectories investigating healthcare communication and teamwork. These currently conceptualise communication and teamwork as individually-based skill sets and capabilities. As discussed in the literature review, these conceptualisations overlook the complexity of spatial, social, somatic, material, disciplinary and institutional aspects of practice, other than language, as well teleological elements of practice. As a consequence

these approaches, that see collective knowledge as simply a transfer issue, continue to focus on miscommunication as central to safety and quality in healthcare.

More recently, however, researchers have begun to see that organisational and systemic factors are impacting on individual practitioners. 'To adopt the language of patient safety, such organizational and systemic factors should be seen as potential 'root causes' that [ ] allow miscommunication errors to arise' (Wynia 2012, p. 365). New attitudes to safety in European regulations sanction

> the co-responsibility of the individual and the organization in accomplishing safety and in combating behaviour contrary to it. But they have not recognized the role of the community of practitioners in the production and management of knowledge (Gherardi 2006, p. 235).

It is evident that the production and management of ED knowledge, as the model stands, interrogate the safety and quality of patient experiences 'bundled' as they are with the ED's 'material arrangements' (Schatzki 2006). The ED model of care is set up in ways that maintain the vested interests of medicine in particular. This raises questions about the sustainability of the current model of ED care if knowing needs to be recursively constituted and is so fragmented in one space.

Another possibility for considering change is that proposed by Fox (2002). Fox argues that dynamic relations between nurses, doctors and patients *can shift* in their regimes of power and authority. The concept of 'nomadology' – 'replacing monolithic definitions of reality with a multiplicity of *narratives'* – (based on Deleuze and Guattari's concept in Fox 2002, p. 354), as Jane Edna's and Joel's stories have illustrated, is applicable here. In the first instance, this might include an openness to new ways of doing, saying and being in healthcare settings, one in which experienced nurses, knowledgeable patients and junior doctors are more open to learning and knowing together in emergent and dynamic ways in a context characterised by volatility and fragility. This will involve setting aside teleologies of learning, or unlearning, as well as recognising the uncertainties and limitations to knowing – whether personal, professional or scientific – the not knowing that nurses and doctors work with daily in the ED. This might begin with nurses and doctors *practising knowing* in different ways.

Appendix 1 – Situating this thesis in a larger ARC study

The data in this thesis was part of an ARC study originally designed to follow 100 patients through an ED consultation. The methodology was to audio-record their consultations from triage (an initial assessment by a triage nurse to determine urgency and acuity) to disposition (when a decision is made about whether the patient would be admitted into the hospital or sent home). The ARC study team wanted to analyse the semantic, interpersonal and contextual features of patient-clinician interactions to identify and analyse causes of misunderstandings and breakdowns. Ineffective communication had been identified as the major cause of critical incidents in public hospitals (Kohn, Corrigan & Donaldson 1999; NSW Department of Health 2005).

My doctoral work, presented as this thesis, was thus situated in this Australian Research Council (ARC) Linkage project *LP0775435, Emergency Communication: Addressing the challenges in healthcare discourses and practices.*

Industry partners in the ARC project included:

- EDs in two large city hospitals under the umbrella of a major Sydney area health service;
- one ED in one small city hospital and one ED in a semi-rural hospital under the umbrella of another Sydney area health service; and
- an ED in a city hospital in the Australian Capital Territory (ACT) operating under the ACT Health service.

The ARC project aims were to:

- describe communication encounters that occurred between clinicians and patients in the ED in order to identify the features of both the successful and unsuccessful interactions;
- analyse the breakdowns in communication that occur in these spoken interactions; and
- identify ways in which doctors and nurses could enhance their communicative practices thereby improving the quality of the patient journey through the ED.

The following data were collected in the ARC project:

- over 1,000 hours of observations inside five emergency departments;

- 242.75 hours spent directly observing ED work;

- audio-recordings of 82 patients from triage to disposition;

- 150 staff interviews; and

- the examination of medical records of all 82 patients.

Soon after the inception of the study, I began to do my own PhD analyses of the data collected. I focused on systemic practice and organisational issues and knowledge in the ED, a focus that was separate from the focus on clinician-patient communication that the ARC project team was investigating. Although some of my findings were specifically developed outside the ARC the project (i.e. as part of my thesis), they were incorporated into presentations and discussions on the project. For example, these included findings on Patient 25 Jane Edna and Patient 42, Joel that I have included in this thesis in detail.

This thesis outlines more explicitly the relationship between my project and my PhD work at various points. To date, a total of eight reports, which came out of the ARC project, have been printed/published by UTS and a book chapter on the data has been written. These are listed under Publications.

In all these reports I included data findings and figures from my PhD work, the figures of which have all been referenced as my work. I am also listed as the first author in all except one report. In addition, slides with findings from my PhD and figures were included in a number of presentations made to overseas conferences and partner presentations in Australia. Figures and text from one of the reports have also been used in a current Australian Learning and Teaching Council (ALTC) Project entitled 'Resources and methodologies for learning and teaching effective communication in emergency healthcare settings' (CHEC). This has been done with my approval and my work will be appropriately acknowledged and referenced.

Because the criteria for a PhD are that original work and contribution to knowledge must be demonstrated, the thesis progressively outlines what has been my distinctive contribution to knowledge and how aspects of this have developed both apart from, and in conjunction with, the broader ARC project.

Appendix 2 – Identifying the hospital data[27]

Hospital A data (St Williams Hospital (large urban ED))

Hospital A data No	**Name**	**Patient demographics**	**Presenting illness/ injury**	**Time: triage**	**Time triage to seen by doctor**	**Length of stay**	**Triage Cat.[28]**	**Clinician info[29]**	**Recorded time[30]**
P01	Jacinta	Female, 29 years, ESB (Australia)	Left ankle injury	Triage not recorded	1 hr 13 mins	1 hr 40 mins	4	1x nurse; 1x doctor; 1x researcher; 1 x radiography staff; 2 x other staff	23.5 mins
P02	Kathryn	Female, 83 years, ESB (Australia)	Dizziness	9 mins 46 sec	2 hrs 33 mins	6 hrs 47 mins	3	6xnurses; 2xdoctors; 1xresearchers; 14xother staff; 2xfamily; 1xaged care assessor	40.5 mins
P03	Federica	Female, 78 years, NESB (Spain)	Dizziness/funny vision	12 mins 16 sec	4 hrs 51 mins	9 hrs 2 mins	4	7xnurses; 3xdoctors; 1xresearcher; 1xtea lady; 14xother staff; 1xfriend	1.2 hrs
P04	Naama	Female, 50 years, NESB (Lebanon)	Sore toe	3 mins 22 sec	1 hr 24 mins	1hr 39mins	4	1xnurse; 1xdoctor; 1xresearcher; 1xfamily; 1xradiography staff	22.3 mins
P05	Chaitali	Female, 67 years, NESB (Sri Lanka)	PV bleeding	5 mins	40 mins	6hrs 9 mins	3	4xnurses; 2xdoctors; 1xfamily; 4xother staff	57.5 mins
P06	Luca	Male, 69 years, NESB	Stiff neck	6 mins 10	8 mins	30 mins	4	3xnurses; 1xdoctor;	9.44 mins

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[27] Taken from the ARC project records.

[28] Triage category

[29] These are participants recorded at the bedside or participants known to have engaged with the patient (e.g. staff in radiology); others not listed may have been involved in patient's care during the consultation or at other times on the day.

[30] Recorded time is indicative only as it includes talk between patients and researchers as well as family talk. It could be used as a rough indication of recorded talk to disposition.

Hospital A data									
No	**Name**	**Patient demographics**	**Presenting illness/ injury**	**Time: triage**	**Time triage to seen by doctor**	**Length of stay**	**Triage Cat.[28]**	**Clinician info[29]**	**Recorded time[30]**
		(Croatia)		sec				1xresearcher; 2xother staff	
P07	Carlina	Female, 51 years, ESB (Australia)	Cut finger	4 mins 49 sec	58 mins	3hrs 6 mins	4	3 x nurse; 2 x doctor; 2xradiography staff; 5xother staff	29.3 mins
P08	Mara	Female, 84 years, ESB (Australia)	Blockage of oesophagus	6 mins 34 sec	21 mins	2hrs 58 mins	3	3xnurses; 2xdoctors; 2xresearchers	47 mins
P09	Olander	Male, 92 years, ESB (Australia)	Fall/head injury	5 mins 15 sec[31]	50 mins	2hrs 20mins	3	4xnurses; 1xdoctor; 3xresearchers; 1xother staff	1.5 hrs
P10	David	Male, 69 years, ESB (Australia)	Swollen testes	Triage not recorded	13 mins	5hrs 11mins	3	5xnurses; 3xdoctors; 2xresearchers; 2xsonography staff; 5xother staff	44.9 mins
P11	Andre	Male, 23 years, ESB (Ireland)	Sore foot	3 mins 56 sec	18 mins	1hr 59mins	4	2xnurses; 1xdoctor; 1xresearcher; 1xradiography staff	13 mins
P12	Ghadeen	Female, 26 years, NESB (Lebanon/Jordan)	Back pain	Triage not recorded	18 mins	2hrs 34mins	3	4xnurses; 1xdoctor; 2xresearchers; 1xfamily	47.6 mins
P13	Wanda	Female, 47 years, ESB (Australia)	Ear piece from hearing aid stuck in ear	Triage not recorded	22 mins	1hr 7 mins	4	2xnurses; 2xdoctors; 2xresearchers; 1xother staff	14.22 mins
P14	Wena	Female, 35 years, ESB (Australia)	PVB and abdominal cramps	7 mins 38 sec	20 mins	1hr 25 mins	3	2xnurses; 2xresearchers; 1xdoctor; 1xfamily; 2xother staff	24.6 mins
P15	Natasha	Female, 36 years, ESB (Southern Africa)	Post op infection	6 mins 3 sec	3 hrs 52 mins	4hrs 39mins	4	2xnurses; 1xdoctor; 1xresearcher; 1xfamily	29.2 mins

[31] This is 'ambo' handover.

No	Name	Patient demographics	Presenting illness/injury	Time: triage	Time triage to seen by doctor	Length of stay	Triage Cat.[28]	Clinician info[29]	Recorded time[30]
Hospital A data									
P16	Jamal	Male, 46 years, NESB (Iran)	Low haemoglobin	11 mins 38 sec	19 mins	3hrs 5mins	3	4xnurses; 3xdoctors; 2xresearchers; 1xfamily; 1xradiography staff; 2xother staff	1.4 hrs
P17	Denae	Female, 43 years, ESB (Australia)	Left foot injury	6 mins 51 sec	34 mins	1hr 37mins	4	1xnurse; 1xdoctor; 2xresearchers; 1xother staff	32.32 mins
P18	Janice	Female, 38 years, ESB (Australia)	Bad back	Triage not recorded	1 hr 44 mins	2hrs 56 mins	4	2xambos; 3xnurses; 1xdoctor; 2xresearchers; 2xfamily; 1xother staff	1 hr 5 mins
P19	Ina	Female, 43 years, ESB (Australia)	Pain post procedure	9 mins 9 sec	28 mins	5hrs 30 mins	3	3xnurses; 2xdoctors; 2xresearchers; 1xorderly; 1xother staff	1 hr 15 mins
Average times				7mins 30sec	68 mins	3hrs 23mins			

Hospital B data (Healthy Hospital (semi-rural ED))

No	Name	Patient demographics	Presenting illness/injury	Time: triage	Time: triage to seen by doctor	Length of stay	Triage Cat.	Clinician Info	Recorded time
Hospital B data									
P20	NA	Female, elderly	NA	NA	NA	NA	NA	NA	NA
P21	Jean	Female, 64, ESB (Australia)	Review suture for leg injury	1min 4sec	10mins	55mins	5	2xnurses; 1xdoctor; 1xfamily; 1xresearcher	30min 42sec
P22	Evan	Male, 32, ESB (Australia)	Fell down stairs; bruising to sacrum	3min 2 sec	3mins	1hr 1min	5	1xnurse; 1xdoctor; 1xresearcher	12min

Hospital B data

No	Name	Patient demographics	Presenting illness/injury	Time: triage	Time: triage to seen by doctor	Length of stay	Triage Cat.	Clinician Info	Recorded time
			with haematoma						
P23	Bertha	Female, 89, ESB (Australia)	Knee gave way when shopping	2min 59sec	1hr 9mins	2hrs 55mins	5	3xambos; 6xnurses; 1xdoctor; 1xresearcher; 2xother staff; 1xorderly; 5xradiography staff (including students); 1xphysio; 1xaged care student	1hr 16min
P24	Janelle	Female, 40, ESB (Australia)	Fell over in twisting motion; very tender ribs	5min 42sec	1hr 3mins	3hrs 43mins	4	4xnurses; 2xdoctor; 1xfamily; 2xother staff; 1xresearcher; 1xradiography staff	1hr 13min
P25	Edna	Female, 95, ESB (Australia)	Chest pain; lower epigastric pain	4min 45sec	5mins	11hrs 15mins	3	2xambos; 7xnurses; 3xdoctors; 2xresearchers; 2xorderlies; 1xASET; 5xother staff; 1xradiography staff	3hr 9min
P26	Kenneth	Male, 27, ESB (Australia)	Spider bite	2min 45sec	28mins	4hrs 10mins	4	3xnurses; 1xdoctor; 1xresearcher; 1xclerical; 1xother staff	52min 28sec
P27	Ewan	Male, 77, ESB (Australia)	Ache in LT arm; chest discomfort/ pain with exercise	7min 43sec	1hr 32mins	4hrs 4mins	3	5xnurses; 2xdoctors; 2xresearcher; 1xadmin; 1xorderly	1hr 13min
P28	Rordan	Male, 50, ESB (Australia)	Burn dressing	Not recorded	8mins	23mins	5	2xnurses; 1xresearcher	10min 45sec
P29	Davin	Male, 40, ESB (Australia)	Neck pain, numbness, tingling in fingers, heaviness in arms	11min 48sec	12mins	5hrs 34mins	3	5xnurses; 1xdoctor; 1xambo; 1xclerk; 4xother staff; 1xfamily 2xfriends; 1xresearcher	1hr 16min
P30	Janet	Female, 54, ESB (Australia)	Abdo pain	4min 26sec	39mins	7hrs 39mins	4	4xnurses; 1xdoctor; 1xfamily; 1xresearcher; 3xother staff; 1xorderly; 2xradiography staff	1hr 26min
P31	Riana	Female, 21, ESB	Laceration with dirty	4min 24sec	33mins	3hrs	5	3xnurses; 1xdoctor;	18min 18sec

Hospital B data									
No	**Name**	**Patient demographics**	**Presenting illness/injury**	**Time: triage**	**Time: triage to seen by doctor**	**Length of stay**	**Triage Cat.**	**Clinician Info**	**Recorded time**
		(Australia)	scalpel			8mins		1xresearcher	
P32	Brenda n	Male, 69, ESB (Australia)	Foot injury	4min 49sec	38mins	3hrs	5	3xnurses; 1xdoctor; 1xresearcher; 2xradiography staff; 3xphysios; 3xstudent physios; 1xother staff; 2xfamily	1hr 5mins
P33	Bethan y	Female, 55, ESB (Australia)	Dizziness and nausea	Not recorded	15mins	3hrs 23mins	4	4xnurses; 2xdoctors; 1xresearcher; 1xadmin; 1xother staff	1hr 18sec
P34	Graydo n	Male, 51, ESB (Zimbabwe)	Sent in by cardiologist for Admission and telemetry	3min 48sec	31mins	6hrs 45mins	4	3xnurses; 2xdoctors; 1xresearcher; 2xfamily; 4xother staff; 9xradiography staff (including students)	2hr
P35	Joanne	Female, 91, ESB (Australia)	Fell out of bed	Not recorded	11mins	2hrs 27mins	4	3xnurses; 1xdoctor; 1xresaercher; 6xother staff; 1xradiography;staff; 1xphysio; 1xnurse liaison	1hr 3mins
P36	Lisa	Female, 47, ESB (Australia)	Fell on knees, hurt back	Not recorded	30mins	3hrs	4	2xambos; 3xnurses; 1xdoctor; 1xresearcher; 3xradiography staff; 1xorderly	49min 40sec
P37	Nola	Female, 70, ESB (Australia)	PR bleeding	Not recorded	6mins	5hrs 59mins	3	3xnurses; 3xdoctors; 1xresearcher; 1xother staff	1hr 25min
Average times				4min 46sec	29mins	4hrs 4mins			

Hospital C data (Greater Beach Hospital (semi-rural ED))

Hospital C data									
No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P38	Denton	Male, 79, ESB (Australia)	Temperature, and COPD	Not recorded	1hr	5hrs 30mins	3	2xambos; 8xnurses; 2xdoctors; 1xresearcher; 1xradiography;staff 1xorderly; 4xother staff	2hrs 5mins
P39	Powell	Male, 43, ESB (Australia)	Severe shingles	Not recorded	2hrs 30mins	8hrs	4	3xnurses; 1xdoctor; 1xresearcher; 1xfamily; 1xadmin; 3xother staff	1hr 35 mins
P40	Jillian	Female, 88, ESB (Australia)	Asthma – breathing difficulty	29mins	1hr 15mins	6hrs 30mins	3	2xambos; 6xnurses; 2xdoctor; 1xresearcher; 2xradiography staff; 1xadmin; 1xorderly; 2xother staff	2hrs 42mins
P41	Alywn	Male, 76, ESB (Australia)	Swollen/painful knee	2mins (partial recording)	10mins	3hrs 5mins	4	3xnurses; 2xdoctor; 1xresearcher; 1xother staff	1hr 24mins
P42	Joel	Male, 65, ESB (Australia)	Severe pain in left leg, difficulty mobilising	3mins	20mins	7hrs 2mins	4	2xambos; 6xnurses; 1xdoctor; 1xfamily; 1xresearcher; 1xtea lady; 1xorderly; 1xradiography staff; 1xother staff	2hrs 12mins
P43	Sharnelle	Female, 40, ESB (Australia)	Reaction to a number of medications	6mins	40mins	1hr 30mins	4	1xambo; 1xnurse; 1xdoctor; 1xresearcher	57mins
P44	Clark	Male, 44, ESB (Australia)	Back pain	9mins	3hrs 45mins	6hrs 32mins	5	2xambos; 6xnurses; 2xdoctors; 1xresearcher; 2xother staff	1hr 8mins

Hospital C data									
No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P45	Blair	Male, 19, ESB (Australia)	Sore jaw, slurred speech, headaches, nausea as a result of sporting accident	Not recorded	9mins	1hr 20mins	4	2xdoctors; 1xresearcher	59mins
P46	Garth	Male, 44, ESB (Australia)	Ripped finger	3mins	1hr 6mins	6hrs 23mins	3	5xnurses; 2xdoctors	1hr 18mins
P47	Tracey	Female, 20, ESB (Australia)	Fall, lower back pain	Not recorded	1hr	3hrs 15mins	4	1xnurse; 1xdoctor	49 mins
P48	Wilburn	Male, 82, ESB (Australia)	Fainted	Not recorded	1hr 55mins	6hrs 23mins	4	1xnurse; 1xdoctor	-
P49	Forbes	Male, 73, ESB (Australia)	PR bleeding	Not recorded	1hr 33mins	7hrs 29mins	4	3xnurses; 3xdoctors	2hrs
P50	Nora	Female, 63, ESB (Australia)	Chest pains	Not recorded	35mins	6hrs 14mins	3	1xnurse; 2xdoctors	1hr 10mins
P51	Estella	Female, 78, ESB (Australia)	Spiral leg fracture	Not recorded	45mins	1hr 30mins	4	2xnurses; 1xdoctor	24mins
P52	Dulcie	Female, 63, ESB (Australia)	Difficulty breathing	8mins	26mins	9hrs 4mins	4	5xnurses; 2xdoctors	2hrs 16mins
P53	NA	Female (Australia)	Abdominal pain, fever, vomiting	Incomplete recording	3hrs 17mins	NA	4	NA	NA
Average times				9 mins	1hr 16mins	5hrs 19mins			

Hospital D data (St Crispin's hospital (large urban ED))

Hospital D data									
No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P54	Sean	Male, 41, ESB (Australia)	Injured middle toe	Not recorded	33mins	1hr 50mins	5	2xnurses; 1xdoctor 1xresearcher; 1xfamily; 1xother staff	22 mins
P55	Doreen	Female, 67, ESB (Australia)	Sore eyes; denies any injury	Not recorded	11mins	1hr 47mins	5	2xdoctors; 1xresearcher	45mins
P56	Marchello	Male, 61, NESB (Holland)	Suspected DVT; pain in calf after long flight	9mins	29mins	1hr 12mins	4	2xnurses; 1xdoctor; 1xresearcher; 2xother staff; 1x admin; 1xfamily	36mins
P56.5	Davis	Male, 43, ESB (Australia)	Pain in left side	Incomplete recording	6hrs	6hrs	4	1xnurse; 1xresearcher; 3xother staff	4 mins
P57	Vincenzo	Male, 71, NESB (Italy)	Wound review	Not recorded	59mins	1hr 50mins	4	1xnurse; 1xresearcher	45mins

Hospital D data No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P58[32]	Jim	Male, 35, ESB (Australia)	Urinary stricture, can't void	Not recorded	50mins	6hrs 25mins	3	4xnurses; 2xdoctors; 1xresearcher; 2xfamily	1hr 25mins
P59	Doris	Female, 85, ESB (Australia)	Tired with intermittent headache; BP up	17mins	14hrs27mins	21 hrs 19mins	4	2xnurses; 1xresearcher; 1xfriend; 1xadmin	21mins
P60	Casey	Female, 27, ESB (Australia)	Disoriented; developed acute parathesia to right arm	8mins	1hr 56 mins	7hrs 40mins	3	5xnurses; 4xdoctors; 1xresearcher; 3xfamily	1hr 9mins
P61	Helios	Male, 70, NESB (Greece)	U/S on arm; presents for results	Not recorded	1hr 24 mins	2hrs 25mins	4	1xdoctor; 1xresearcher; 1xother staff	19mins
P62[33]	Donna	Female, 49, ESB (Australia)	HX anal fissure; pain increasing	Incomplete recording of Triage	10mins	3hrs 30mins	3	6xnurses; 2xdoctors; 1xresearcher; 1xfamily; 1xother staff	2hrs 7mins
P63	Adrian	Male, 20, ESB (Australia)	MVA; C/O back pain and shoulder pain	Not recorded	32mins	58mins	4	2xnurses; 1xphysio; 1xresearcher	21mins

[32] This patient was distressed and in pain. Was told he needed surgery and was referred to specialists but not admitted to hospital.

[33] This patient was distressed and in pain. Was told she needed surgery and was referred to specialists but not admitted to hospital.

Hospital D data									
No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P64	Brenda	Female, 21, ESB (Australia)	States she has migraine	Not recorded	4hrs 40 mins	5hrs 44mins	4	5xnurses; 1xdoctor; 1xresearcher; 1xfamily	36mins
P65	Erica	Female, 39, ESB (Australia)	Burns to face	Not recorded	2hrs 24mins	2hrs 46mins	4	1xambo; 1xnurse; 2xdoctors; 1xresearcher; 1xfriend	14mins
P66	Miriam	Female, 56, ESB (Australia)	PT JBIBA post experiencing sensation of throat and tongue tingling sensation	Not recorded	2hrs 42 mins	2hrs 38mins	4	3xnurses; 2xresearchers	6mins
P67	Jacob	Male, 26, ESB (Australia)	Deep laceration to thumb and finger	Not recorded	57mins	2hrs 30mins	4	2xnurses; 3xdoctors; 1xresearcher; 3xother staff; 1xradiography staff	1hr 20mins
P68	Gemma	Female, 56, ESB (Australia)	Pain in back and chest, slight rash	Not recorded	2hrs 19 mins	2hrs 40mins	4	1xdoctor; 1xresearcher	19mins
P69	Dickson	Male, 30, ESB (Australia)	Right side abdo pain	Not recorded	23mins	4hrs 10mins	3	3xnurses; 2xdoctors; 1xresearcher; 2xother staff	42mins

Hospital D data									
No	Name	Patient demographics	Presenting illness/ injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician info	Recorded Time
P70	Jack	Male, 41, ESB (Australia)	Feeling unwell; weak, lethargy, pain; C/O underarm pain	Not recorded	3hrs 37 mins	9hrs 40mins	4	7xnurses; 2xdoctors; 1xresearcher; 2xfamily; 1xother staff	1hr 6mins
P71	Wilson	Male, 40, ESB (Australia)	Increased pain in right greater to; unable to weight bear on foot due to pain	Not recorded	3hrs 53 mins	11hrs 47mins	4	6xnurses; 2xdoctors; 1xresearcher; 1xcleaner; 3xother staff	1hr 34mins
Average times				11mins	2hrs 33mins	5hrs 2mins			

Hospital E data (St Geremias Hospital (large urban ED))

Hospital E data									
No	Name	Patient demographics	Presenting illness/injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician Info	Recorded Time
P72	Kirsty	Female, 42 ESB (Australia)	Extreme pain in lower abdomen	4mins	2hrs 54mins	10hr 37mins	?	1 x nurse; 1 x doctor; 1 x radiologist	42mins

Hospital E data No	Name	Patient demographics	Presenting illness/injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician Info	Recorded Time
P73	Jayden	Male, 33, ESB (Australia)	Noise in ear and sore ear	Not recorded	15mins	3hr 3 mins	5	2 x nurses; 1 x advanced practice nurse; 1 x doctor;	28mins
P74 (01)	Fahime[34]	Female, 47, NESB (Lebanon)	Dizziness, feeling stressed	Not recorded	31mins	1hr 30mins	4	2 x nurses; 3 x doctors (2 x student doctors)	51mins
P75 (02)	Vince	Male, 84, ESB (Australia)	Can't lift legs. Stroke?	Not recorded	35mins	6hrs 8mis	3	2 x nurses; 2 x doctors	1hr 10mins
P76 (03)	Zahara	Female, 40, ESB (Yugoslavia)	Abdominal Pain	Not recorded	1hr 30mins	4hrs	3	2 x nurses; 2 x doctors	44mins
P77 (04)	Clement	Male, 84, ESB (Australia)	Left sided chest pain	Not recorded	12mins	15 hrs 52mins	3	2 x nurses; 3 x doctors; 1 x radiography	2hrs 26mins
P78 (05)	Robert	Male, 81, ESB (Australia)	Urinary blockage	Not recorded	5mins	3 hrs 20mins	3	2 x nurses; 1 x doctor	1hr 21mins
P79 (06)	Zhu	Male, 26, NESB (China)	Vertigo	Not recorded	2hrs	2 hrs 17 mins	4	1 x nurse; 2 x doctors	11mins
P80 (08)	Nellie	Female, 87, ESB (Australia)	Cellulitis, pain left elbow	Not recorded	12mins	6 hrs 40 mins	3	2 x nurses; doctors	2hrs 25mins

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[34] Patients 74 – 82 recorded as part of pilot project in 2006.

Hospital E data									
No	Name	Patient demographics	Presenting illness/injury	Time: triage consultation	Time: triage to seen by doctor	Length of stay	Triage cat	Clinician Info	Recorded Time
PX (09)	1/6/06	Female, ESB (Australia)	Migraine	Not recorded	1hr 17mins	DNW	4		Left ED before consultation
P81 (10)	Judy	Female, 34, ESB (Australia)	Right eye infection	Not recorded	15mins	49 minutes	4	1 x nurse; 2 x doctors	19mins
P82 (11)	Anne	Female, 81 ESB (United Kingdom)	Swollen finger	Not recorded	47mins	1 hour 43 mins	4	1 x nurse; 2 x doctors	35mins
Average time					53 mins[35]	5hrs 5mins			

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[35] Includes times from 2006 and 2009, hence not meaningful indicative average.

Appendix 3 – Presenting the data collection methods and questionnaires

The focal point of data collection is the various types of healthcare discourses that occur along the patient's journey through ED care. The combination of methods makes it possible to analyse how talk is socially organised around healthcare practices and how language, culture and other ethnographic factors, and the workplace, impact on the effectiveness of communication. The six phases of the research and these methods are outlined below:

1 – Familiarisation and consultation: Initial consultations with key informants at collaborating hospitals in order are held to: foster an understanding of the purpose of the project; discuss project ethics, recruiting and other issues of concern; and develop an organisational-contextual map of each site.

2 – Interviews and participant-observation in the field: Semi-structured interviews with key informants (healthcare practitioners, patients, relevant administrative staff), and field observations at each site are held in order to build an overall picture of the numbers and types of interactions, problems and issues related to communication, and the clinical and communicative 'traffic' of the EDs in the study. The researchers discuss their observations with observed staff in order to clarify, refute and/or expand their initial understanding of the meaning of the observed practices. Field notes are taken as are observation schedules that are standardised for comparison among sites. Local customs and practices that directly impact on interactions between practitioners and patients are interrogated in order to uncover 'unwritten rules' and that which is taken for granted. In addition, written policies and procedures that affect communication between clinician and patient are being analysed.

3 – Audio-taping and analysis of interactions between patients and clinicians: Individual patients' interactions with clinicians are tracked and recorded in order to provide spoken language for analysis. Patients are approached about participating in the study after they have been given a triage code. Only patients with triage codes 3, 4 and 5 are asked to participate in the study (codes 1 and 2 are patients needing immediate resuscitation or are victims of trauma). Patients are then consented into the study and have a microphone attached to begin audio-recording. Clinicians on duty are informed and provided with an

'opt out' if they do not want their conversations recorded (although their communication through clinical notes on the patient record will be accessible to the research team). These recordings form a map of the patient's interactive journey through the ED experience from as early in the process as possible until they are discharged from the ED.

Sample: Eighteen patients' interactions from each of the five hospitals are being recorded, making a total of 90 patients tracked. This calculation is based on 3 patients being recorded at each site for 8 hours (the average length of stay of admitted patient at St Geremias ED in 2005) times 6 work shifts. Fieldwork will continue until 90 patients have been successfully tracked and recorded – minimum one per trip. This sample is selected to capture a diversity of patients' cultural and linguistic backgrounds, covering also age and gender variation, and day time/night time intakes that typify metropolitan hospital ED sites.

4 – **Fieldwork Follow Up:** Interviews with key clinical staff and patients; relevant clinical document analysis; ongoing analysis: This stage involves follow-up interviews with key informants at each hospital. This stage, overlapping with stage three, will aim to develop a detailed mapping of the patient's journey throughout the ED, including a description of the clinician-clinician interactions, carer-patient interactions, and the inter- and intra-departmental pressures that affect the patient's journey. It will compare healthcare practitioners' perceptions of communication effectiveness and clinical outcomes with patients' accounts of interactions. Specifically, data will be gathered from the following:

- Patients who have had their interactive journey through the ED audio-recorded will be provided with a self-completing survey and up to one third or 30 consenting patients contacted following discharge will be interviewed briefly by phone about their experience and their satisfaction with the clinical communication that occurred. Participants will be selected on the basis of identified communication issues that occurred during their stay in the ED.

- Clinical ED staff who were on duty and dealt with the participating patients will be interviewed about their experience and satisfaction with the clinical communication they had with that patient and carer(s) on the relevant shift/s, and asked to provide any further information about the patients' clinical status that may be relevant (e.g. if there were problems making an appropriate diagnosis as a result of difficulties

communicating with the patient, or if there were particular timing/beds/rostering pressures in the department that day).

In addition to interviews, the healthcare record (written clinical notes) of participating patients will be accessed. Data from the patient's healthcare record that pertains to the visit observed and recorded will be analysed to ascertain a full picture of the patient's journey through the ED.

5 – Analysis/Dissemination: The project will collect a substantial volume of complementary data requiring sophisticated analysis accommodating the various collaborators/industry partners. Given the scope of hospital sites across NSW, analysis will need to consider what is transferable and what is specific to the hospital sites. Intensive workshops for investigators (at UTS) to develop an integrated inter-disciplinary understanding and collaborative frameworks for interpreting data will be required, as will ongoing consultation with partners and other stakeholders to relate discourse analysis outcomes and their reframing as useful and generally understandable descriptions of communication encounters. Combining these data will provide a basis for analysing protocols in practice, and for the development of best practice descriptions and strategies.

The following data collection methods were used as part of the ARC project; only some have informed this thesis:

- non-participant observation in the field of bedside practices and clinician-clinician networks;
- audio-recording of consultations;
- medical records and other healthcare texts including policy documents;
- reviews of patient ED healthcare records to ascertain clinical information that situated the patient's journey; and analysis of policies and procedures that affected communication networks in ED – patient records have been used to establish connections between clinicians;
- semi-structured interviews (based on questionnaires) with key emergency clinicians selected for their knowledge of the context, prior to and following fieldwork – these have not been used in this thesis;

- follow-up interviews with emergency clinicians while in the field in order to clarify meaning of observed practices – these have been used in this thesis where applicable; and

- reflective surveys of patients' and emergency clinicians' experiences to capture perspectives on communication and care and team roles of care – these have not been used in this thesis.

Observation cover sheet: emergency communication

Addressing the challenges in healthcare discourses and practices

1. NAME OF HOSPITAL: Hospital A
2. DATE:
3. CODE – NOT TO BE COMPLETED BY OBSERVER:
4. NAME OF PERSON RECORDING OBSERVATIONS:
5. IDENTIFY LOCATION OF RECORDING: ED 'bridge'

Please note on this sheet and recording sheets that follow the particular area where your units of observation have occurred. If you change your area, please start a new observation cover sheet and package.

6. THE TOTAL TIME PERIOD OF YOUR OBSERVATIONS: 19.25 – 20.15 = 50 minutes

Please specify the 'overall' start and end time of your observations on this cover sheet. For example, 9am – 2pm.

FOR YOUR INFORMATION:

7. MAKING COMMENTS ON WHAT YOU HAVE OBSERVED:

On the reverse side of each observation recording sheet there is a space for making comments on that unit of observation. Please use this to develop commentary on what you have observed – things that stand out, themes/patterns, deviations, etc. You may also wish to refer to the areas of interest prompt sheet. You may also wish to provide an overview commentary page – this will cover your overall thoughts about the period of your observation.

8. THE PROMPT SHEET:

A prompt sheet is also attached. This identifies areas of observational interest. This will assist with your observations. You may also wish to reference the areas of interest in your separate commentary on your observations.

9. ASSEMBLING YOUR OBSERVATION NOTES:

When you have completed your observation period, 2, 3, 6 hours, etc., PLEASE assemble the documents as follows:

- Your cover sheet with all details completed. This will provide the total period during which you made your observations
- As many sheets of recorded observations as you have made. Generally these will cover 5-minute units. You will also have made some commentary on the reverse side of all/some of these pages
- An overall commentary page (if required).

Field recordings: checklist and prompts

The work environment: the physical place
How large/small is it? Is it congested/full of objects and/or people? Is it busy/quiet? What kind of competing noises are there (telephones, beepers, pagers, conversations, announcements, television)? Is there much ED activity? (Include drawings/sketches **on the back of this page**)

Objects
What physical things are present in the space (beds, other furniture, technical equipment, trolleys, noticeboards, etc.)? (Include drawings/sketches)

Patients/carers
What are patients doing and how are they interacting with those around them? What are carers doing and how are they interacting with patients and others around them? How do patients/carers appear to be experiencing – calm, agitated, distressed, etc.?

Actors: patient-focused
Who are the people involved with the patient (doctors, nurses, allied health personnel, clerical staff, etc.) and what are they doing?

Actors: others

Who are the other people in the vicinity, who are not directly interacting with the patient (other patients or carers; healthcare workers attending other patients; orderlies, cleaning staff, etc.) and what are they doing?

Time

Sequence of patient-focused acts over time (including time of individual interactions between healthcare workers and patient, and gap times when patient left alone). Sequence of other acts – discussion, time on phones, handovers, etc.

Written texts

What written documentation is used in the ED (computerised ED information service – EDIS; noticeboards, clipboards, patient files), how are they used (frequency) and by whom)?

Other noteworthy observations (Touch points, moments of significance)

Appendix 4 – Publications related to this thesis

Iedema, R. & Manidis, M. 2013, *Patient-Clinician Communication: An Overview of Relevant Research and Policy Literatures*, Australian Commission on Safety and Quality in Health Care and University of Technology, Centre for Health Communication, Sydney.

Lee, A., Steketee, C., Rogers, G. & Moran, M., 2013, 'Towards a theoretical framework for curriculum development in health professional education', *Focus on Health Professional Education: A Multi-disciplinary Journal*, vol. 14, no. 3, 64-77; (Acknowledged for the curriculum representational diagram in this paper).

Manidis, M., Iedema, R. & Scheeres, H. 2012, 'Information Transfer in ERs', *Focus on Patient Safety*, vol. 15, no. 2, pp. 3, 4 & 6.

Manidis, M. & Scheeres, H. 2012, 'Towards understanding workplace learning through theorising practice: at work in hospital emergency departments', in P. Hager, A. Lee & A. Reich (eds), *Practice, Learning and Change: practice-theory perspectives on professional learning*, Springer, Dordrecht, pp. 103-118.

Manidis, M. & Scheeres, H. 2013, 'Practising Knowing: emergence(y) teleologies', *Education Philosophy and Theory*, no. 21 March 2013, http://dx.doi.org/10.1080/00131857.2013.763597.

Manidis, M., McGregor, J., Slade, D., Scheeres, H., Dunston, R., Stanton, N., Chandler, E. & Stein-Parbury, J. 2010, *Communicating in The Emergency Department: Executive Summary Report for Greater Beach Hospital*, University of Technology, Sydney.

Manidis, M., McGregor, J., Slade, D., Scheeres, H., Dunston, R., Stanton, N., Chandler, E. & Stein-Parbury, J. 2010, *Communicating in The Emergency Department: Executive Summary Report for St Crispin's Hospital*, University of Technology, Sydney.

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Manidis, M., Slade, D., McGregor, J., Chandler, E., Dunston, R., Scheeres, H., Stein-Parbury, J., Iedema, R. & Stanton, N. 2009, *Emergency Communication: Report for St Williams Hospital*, University of Technology, Sydney.

Slade, D., Manidis, M., McGregor, J., Scheeres, H., Stein-Parbury, J., Dunston, R., Stanton, N., Chandler, E. & Matthiessen, C. 2011, *Communicating in hospital emergency departments: Final Report*, University of Technology, Sydney, Sydney.

Slade, D., Scheeres, H., Manidis, M., Matthiessen, C.M.I.M., Iedema, R., Herke, M. & McGregor, J. 2008, 'Emergency Communication: The discursive challenges facing emergency clinicians and patients in hospital emergency departments', *Discourse & Communication*, vol. 2, no. 3, pp. 289-316.

McGregor, J., Manidis, M., Slade, D., Scheeres, H., Dunston, R., Stanton, N., Chandler, E. & Stein-Parbury, J. 2010a, *Communicating in The Emergency Department: Executive Summary Report for Healthy Hospital*, University of Technology, Sydney.

McGregor, J., Manidis, M., Slade, D., Scheeres, H., Dunston, R., Stanton, N., Chandler, E. & Stein-Parbury, J. 2010, *Communicating in The Emergency Department: Report for Healthy Hospital*, University of Technology, Sydney.

The Interprofessional Curriculum Renewal Consortium, Australia, 2013, *Interprofessional Education: A National Audit, Report to Health Workforce Australia*, Centre for Research in Learning and Change, University of Technology, Sydney.[36]

Note: Hospital names have been de-identified.

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[36] A decision was made for inclusive authorship on this publication. I am included, as are others, in the acknowledgements of this publication as follows: 'Whilst the input and commitment of all individuals and groups has been important, the work of the project management team based at UTS has been exceptional. The contribution of Marie Manidis, overall Project Manager; Tagrid Yassine, HWA Project Manager; and Chris Rossiter, Research Associate working with the project, has been critical. Their joint efforts, their demonstration of an interprofessional capacity and their positivity and ability to negotiate the many challenges we have experienced has made all the difference. Their work and skill has been greatly appreciated'.

Appendix 5 – Seeing Jane Edna's consultation

Read Turn page to landscape view. Then read from left, top to bottom in successive rows.

Legend: Disturbances are pink; Doctor Louis' talk is gold (D1); different nurses are itemised by number (N3) and are pale yellow; relocations in the ED are red; pale green represents two clinicians talking about their work, their procedures or a piece of equipment; bright green represents two clinicians talking about Jane Edna in earshot. The researchers are bright pink (Re1 & Re2), D2 is deep gold and Jane Edna's initiations are purple (P). These encounters reflect who is talking to Jane Edna; who is talking about her in earshot of her; where nurses and doctors concentrate during the

consultation; when disturbances or noise drown out understanding; when Jane Edna is moved; when Jane Edna says or does something in response. I am seeking to represent the aural, physical, interactional (occasionally emotional as expressed bodily by Jane Edna) complexity that contributes to doing knowledge as activity. What do the nurses and doctors say about Jane Edna – or are they discussing their own procedures? Who speaks to Jane Edna? What is the noise level in the background for Jane Edna's consultation? Jane Edna becomes quite involved in the middle part of her consultation, whereas she does not speak much at all in the beginning of the consultation. The nurses and Doctor Louis concentrate at this point. Right at the end, Doctor Edwina (D2) comes to give her her diagnosis. It is possible to see Jane Edna's movements in the red squares – from the ambulance bay to her bed, to radiography and back, to the toilet and back and so on.

Appendix 5 – Seeing Joel's consultation

Legend: Disturbances are pink; Doctor Surita's talk is gold (D1); different nurses are itemised by number (N3) and are pale yellow; relocations in the ED are red; pale green represents two clinicians talking about their work, their procedures or a piece of equipment; bright green represents two clinicians talking about Joel in earshot. The researchers are bright pink (R), Joel's initiations are purple (P) and the blue squares (F) are Jill, Joel's wife's talk. These encounters reflect who is talking to Joel; who is talking about him in earshot of her; where nurses and doctors concentrate during the consultation; when disturbances or noise drown out understanding; when Joel is moved; when Joel says or does something in response. I am seeking to represent the aural, physical, interactional (occasionally emotional as expressed bodily by Joel) complexity that contributes to doing knowledge as activity. What do the nurses and doctors say about Joel – or are they discussing their own procedures? Who speaks to Joel? What is the noise level in the background for Joel's consultation? Nurses' activity concentrates in the first part of the consultation. Towards the middle there is a lot of discussion between Jill and the nurses and Doctor Surita, procedural and clinical talk about Joel's illness.

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