
Whiteboards: Mediating professional tensions in clinical practice

ROBIN RILEY, ROWENA FORSYTH, ELIZABETH MANIAS, and RICK IEDEMA

Abstract

In this paper we argue that whiteboards in clinical settings play a hybrid role: communicating inter- and intraprofessional directives, mediating professional tensions, and mitigating potentially face-threatening acts. The data upon which this paper is based emanate from two independently conducted ethnographic studies: the first explored a range of nurse–nurse and nurse–doctor communication practices in operating rooms, while the second explored work routines and communication methods in oncology wards. Data collection included fieldwork using observations, interviews assisted by photographic methods, and in the first study, a personal diary. A deconstructive analysis was independently undertaken. As a communication method, the use of whiteboards in clinical settings provided a focal point for the coordination of clinical work activities and for the dissemination of information to large groups of people. Whiteboards were a conduit for potentially face-threatening information in that they facilitated the policing and disciplining of staff, while distancing communicators from one another. We conclude that whiteboards are ‘pseudo-synchronous’ in nature, enabling ‘communication at a distance’. In doing so, whiteboards may facilitate and economize clinical communication but they also perpetuate the invisibility of nurses’ contribution to ensuring safe care, and they mask the symbolic violence that is committed within and between health professionals.

Keywords: whiteboards; communication; deconstruction; health professionals; operating rooms; oncology.

Affiliation(s): R. Riley, E. Manias (University of Melbourne), R. Forsyth (University of NSW), R. Iedema (University of Technology, Sydney)
Correspondence to: Elizabeth Manias
E-mail: emanias@unimelb.edu.au

1612–1783/07/0004–0165
Online 1613–3625
© Walter de Gruyter

1. Introduction

Hospitals are becoming increasingly complex organizations, creating the need for more involved forms of hospital communication capable of multidirectional access and information dissemination. Full computerization of clinical information is still some time away, and, here in Australia at least, clinicians continue to rely on paper for storage and transmission of a large amount of clinical information. Yet, besides paper, another medium plays an increasingly prominent role in hospital communication. As a halfway house between the ‘ecological flexibility’ of paper (Luff et al. 1992) and the general access afforded by computer technology, the whiteboard plays a central communicative role in clinical wards.

This paper draws together data from two studies to report on the use and impact of whiteboards as a pervasive and yet under-reported mechanism of communication in clinical practice. The paper highlights not only the communication function of whiteboards as a means of organizing work, but also the different ways in which the communication mechanism is manipulated and exploited by health professionals to shape clinical practice and influence professional relationships. We show that the whiteboard mediates among clinicians in ways that cut across hierarchies and operate between professions. We begin our paper with an overview of whiteboards as a communication mechanism, detailing their history, physical properties, and how they support clinical practice. Next, we provide methodological details of the two studies that inform our paper, and present data to support our argument that whiteboards have a hybrid role: communicating inter- and intraprofessional directives, effacing nursing expertise (Latimer 2000), mediating professional tensions, and mitigating potentially face-threatening acts. We conclude with a discussion of how whiteboards are an interactive technology that at once reinforces traditional professional hierarchies and that mitigates symbolic violence (Bourdieu 1991).

Communication & Medicine 4(2) (2007), pp. 165–175
DOI 10.1515/CAM.2007.020

2. Whiteboards as a communication technology

In their simplest form, whiteboards comprise a reusable, white laminate surface, which can be written on with colored, erasable pens. Introduced in the business world in the 1980s, they replaced chalkboards in education settings and have been used in diverse organizational situations, such as nuclear power management, railway dispatch, emergency command, and space mission control (Seagull et al. 2003). These days, whiteboards have evolved from simple writing tools to incorporate interactive computer support mechanisms (Xiao et al. 2006), although no accurate genealogy of their use in hospital settings has been recorded.

Whiteboards are referred to as an asynchronous communication channel, or a method of interacting that requires only one party to be active at a time (Coiera and Tombs 1998). Asynchronous communication channels stand in contrast to synchronous communication channels where two or more parties are actively communicating, as in a face-to-face exchange or telephone conversation. Whiteboards seem to possess an inherent ambiguity, however, because of the temporary, transient nature of whiteboard writings, and the complex sociopolitical dynamics of inscription, erasure, and superimposition.

As a communication mechanism, whiteboards fulfill a number of different functions in the clinical settings of hospitals (Seagull et al. 2003; Xiao et al. 2001). Whiteboards serve as a common, central reference point for the dissemination of information: they function as a communal memory tool for the storage of information used to plan and manage clinical practice, and they facilitate simultaneous access by multiple users without interference. Whiteboards also allow for content reconfiguration in locales where tasks are frequently reorganized and adjusted to cater for the contingency of clinical work, and they serve as a catalyst for non co-present, collaborative decision making between coworkers.

Apart from information written in felt pen, whiteboards cater to different kinds of communicative means. For instance, in an observational study of trauma room coordination (Xiao et al. 2001), the removal of a patient call slip from the whiteboard, the written slip of paper detailing patient information and identification, indicated to operating room nurses and surgeons that an operating room technician was *en route* to another clinical setting of the hospital to collect the next patient for surgery. Similarly, the placement of a blue magnetic strip diagonally across the whiteboard indicated a delay in scheduled surgery. In a codified form, these unique symbolic messages relieved much of the burden of communicating to a large number of individuals and comprised an efficient means of coordination.

Whiteboards have been used in hospital ward environments to economize on face-to-face communica-

tion between health professionals. In one Canadian hospital, the intershift, verbal handover of patient information provided by nurses was substituted by a whiteboard (Stanley 1994). In this particular study, increasing length of time and cost were cited as reasons for swapping from verbal handovers to whiteboards, suggesting a valuing of organizational concerns of efficiency over the clinical needs of staff. While recognizing difficulties with the new whiteboard system, such as decreased access to available patient information, it was claimed that 'the standard of care has not diminished; in fact, there is strong support for the notion that our nursing care has improved' (Stanley 1994: 50). However, nurses mourned the loss of interpersonal interaction with colleagues involved in verbal handover, which scholars have suggested provides professional support and educational opportunities for nurses (Parker et al. 1992).

As communicative means that connect team members who are not present simultaneously, whiteboards support 'distributed cognition' (Hutchins 1995: 10). That is, whiteboards make it possible to distribute decision making about patient care across time and space: they connect different members of the health-care team, and they stretch the time period over which decisions are constructed. Distributed cognition is facilitated by the visible, flexible, and potentially democratic nature of the information/communication process. As a consequence of this distributed aspect, it has been suggested that whiteboards facilitate 'collaborative' management (Seagull et al. 2003: 121), enabling several forms of spoken and written communication 'for workers to be able to informate their work and their relationships' (Iedema et al. 2005: 330).

Heartfield's (2005) ethnographic study conducted in a short-stay surgical ward provides an example of how whiteboards can be manipulated to regulate clinical practice. In the ward under investigation, nurses documented information on whiteboards, which was made available to all healthcare staff. The nurses recorded the flow of patients in and out of the ward and they also exercised power by maneuvering information to regulate the speed of patient admissions and discharges. For example, the nurses were sometimes deliberately slow to erase details of discharged patients from the whiteboard, giving the impression that all beds were occupied. Alternatively, nurses sometimes assigned two patients' names to a space on the board, therefore indicating that a bed was occupied by more than one patient—a patient who was in the operating room, and a patient waiting for admission. In this study, patients were subjugated to the periphery, having to compete with the bed as the principal type of 'nursing capital'. Whiteboards became the means through which the nurses were able to control the pace of clinical practice and the turnover of beds.

An increased emphasis on information technology has led to the development of electronic whiteboards

as a way of facilitating communication between health professionals (France et al. 2005; Mendonça et al. 2004). Following the implementation of an electronic whiteboard in France et al.'s observational work in an emergency department, physicians performed more tasks and were interrupted less often than physicians examined previously in conventional emergency departments. Interruptions involving direct patient care occurred less often than those occurring away from the patient area. In the quality improvement study undertaken by Mendonça and colleagues, a virtual whiteboard incorporated as part of a Web-based clinical information system was introduced to address communication difficulties, such as an inefficient paging system, inconsistent communication transfer of information, and the need for enhanced feedback. The virtual whiteboard was used for posting and tracking communication between nurses and doctors to address deficiencies in coordination of care. Health professionals were able to post tasks associated with patients, assign priority levels for these tasks, and the system facilitated acknowledgement by the individual completing the task.

Here, whiteboards provide a means of efficiently managing and coordinating complex communication needs and interactions, sometimes in very unique, symbolic forms.

Given their size and placing, whiteboards embody the potential to rapidly communicate important issues to a large number of people while allowing constant updating of their content. But apart from their communication function of disseminating information, whiteboards also act as an interactive technology, enabling doctors and nurses to manipulate clinical practice, control access to information, and mould professional relationships. It is also possible that the rules documented on written records are different to actual practices carried out by health professionals (Garfinkel 1967), thereby undermining the functional aspirations of forms of communication such as whiteboards. The use of whiteboards as interactive technology has not been considered in the literature, and it is this aspect on which this paper is focused.

3. Methods

This paper combines data from two independently conducted studies. Although conceived with different purposes, the studies nevertheless shared similar methodologies: both studies were ethnographic in approach, and both incorporated the visual recording techniques of photography and video recording for data collection. For the purposes of clarity, these two ethnographic studies are referred to as Study 1 and Study 2, and the data collection sites are detailed in Table 1.

In Study 1, data were collected from three different operating room departments: a large metropolitan

Table 1. *Data collection sites*

	Study 1	Study 2
Hospital 1	Operating rooms	
Hospital 2	Operating rooms	
Hospital 3	Operating rooms	
Hospital 4		Oncology wards (2)

not-for-profit hospital, an outer suburban public hospital, and an inner-city publicly funded specialist hospital in Melbourne, Australia. It aimed to examine how operating-room nursing was shaped and governed through communication practices and processes in the clinical setting. Study 2 was conducted in two oncology wards and the biochemistry laboratory at a metropolitan teaching hospital in Sydney, Australia. It examined the way that the implementation of a computerized system for ordering pathology tests impacted on the work practices and professional relationships of doctors and laboratory scientists. For the purposes of this paper, we focus only on data collected from the oncology wards, since it was in these wards where interactions occurred between health professionals about the whiteboard. All participants provided written consent to participate in the studies, which were reviewed and approved by the ethics committees of the hospitals and universities. Participants' confidentiality is protected by the use of pseudonyms and any identifiable information relating to participating hospitals has also been removed.

As is characteristic of ethnography, data were generated using multiple methods (Hammersley and Atkinson 1997). In Study 1, over 230 hours of observational fieldwork of clinical operating room practice were undertaken. Eleven individual semistructured interviews using the technique of photovoice were also undertaken (Riley and Manias 2003, 2004, 2006; Wang and Burris 1994, 1997),¹ as well as four group interviews with participants from each individual hospital. All interviews were audio-taped and data transcribed verbatim. The first author also kept a diary for two years to record and monitor individuals' behavior and attitudes to the research process, and to document communication with surgeons, anesthetists, and nurses from her position as an operating room nurse.

In Study 2, data collection was conducted on 37 separate days over a period of 18 months and included video recordings, interviews, and ethnographic observation of work routines and communication methods. Here, video recording was chosen as a method of data collection to allow for the replay of data and review by multiple researchers. During the video recording in the wards, whiteboards were filmed on 33 occasions, and still photographs were made of each of the whiteboards for the purposes of analysis. Video recording of a semistructured interview with a clinical nurse specialist from one ward

was conducted to elicit information about the purpose of whiteboards and the way they were used by nurses as part of their daily practice (Forsyth 2006).

Data collection and analysis were conducted concurrently in each of the studies. Field notes, diary entries, and interview transcripts, which were read repeatedly, generated ideas and lines of inquiry that directed further work in the field and questions asked of participants. Rather than undertaking a thematic analysis, we sought to explore the power relations involved in the communication practices of health professionals by conducting a deconstructive analysis (Cheek 2000; Glass and Davis 2004). While a deconstructive analysis may take a variety of forms, our analysis revealed a different understanding to the commonly held perception of whiteboards as a functional, communication method: a reading against the grain of a currently accepted, taken-for-granted understanding of this communication mechanism, unpicking the political aspects of the whiteboard's communicative function.

At a meta-level, we asked the question: 'What are the different communicative practices and processes that health professionals engage in?' Through ongoing reflection on the transcribed data from fieldwork, interviews, and diary entries, we formulated a tentative framework in which we could begin to understand and categorize these different types of practices. To add another layer of analysis, we formulated theoretical questions based on the work of Michel Foucault and his concept of 'technology' (Foucault 1977, 1978, 1979, 1982, 1984): 'How is information managed when using the whiteboard?'; 'How are health professional tensions mediated through their use of the whiteboards?'; and 'How does the whiteboard structure and/or undermine health professionals' communicative positionings?' These questions provided a means of deconstructing how whiteboards were used to shape clinical practices and social relationships. Let us now turn to our empirical data.

4. Data findings

4.1. *Whiteboards as a method of communicating*

Whiteboards were used extensively in the specific department of the four hospitals included in this study. In operating rooms, they were employed to display information about out-of-stock surgical supplies and equipment that had been loaned to other hospitals or sent out for repair. They were also used to identify the location of emergency equipment and instrument trays in sterile storerooms and to record patient details and information relating to surgical procedures in operating rooms. In one operating room department, fifteen whiteboards were counted in the corridors, storerooms, offices, and actual operating rooms.

In each of the operating room departments, there was a main whiteboard placed in a prominent position on a central wall in the main corridor, which displayed the plan for daily allocation of staff to operating rooms. These whiteboards were divided according to the number of operating rooms in the respective departments, and then again into morning and afternoon sessions. Each operating session on the whiteboards appeared as an individual, divided cell. Within these divisions, the names of nursing, medical, and technical staff allocated to work in the operating room, as well as the starting time of the sessions, were displayed. At one hospital, the number and types of operations and the name of only the most senior nurse allocated to a particular operating room were displayed on the whiteboard. Junior nursing staff had to refer to a printed list to find out the operating room to which they had been allocated. While data recorded on the whiteboard for elective surgery remained fairly static and unchanged from when they were first written, the recording of after-hours emergency surgery was altered frequently to reflect the changing surgical priorities and the dynamic power relationships that surrounded these negotiations (Riley and Manias 2006).

In the two oncology wards, the whiteboards were located at the workstation, the administrative hub, where staff congregated to plan and record patient care. In one oncology ward, the board was small enough to sit on the bench top, resting against a counter. Only information about patient-related tasks that doctors needed to perform were recorded by nurses. In the other ward, the whiteboard was much bigger and was attached to the wall opposite the workstation. Doctors used this larger board to communicate patient-related information with each other, by leaving a note attached to the whiteboards, or by writing a pager number for a colleague. Nurses also used the whiteboards for non-patient-related communication, to convey information with each other about ward equipment that was being repaired or required for use.

Most commonly, in the oncology wards nurses used the whiteboards to communicate to doctors about patient-related tasks that needed to be completed. Messages could be a request to do with monitoring the patient's condition, such as tests to be carried out, pathology results or requests relating to ongoing treatment for patients, such as medications, intravenous fluids, or intravenous management. The written messages were brief and decontextualized, as the physical size of the board restricted what could be recorded. Messages usually consisted of patients' bed number (usually circled) and between two to five words about what needed to be done. The language tended to be active in nature, in the sense that the messages usually contained verbs (need, rechart, review, resite, rewrite, chase, chart, confirm, cease, check), as shown in Figure 1. Expressions of psychosocial

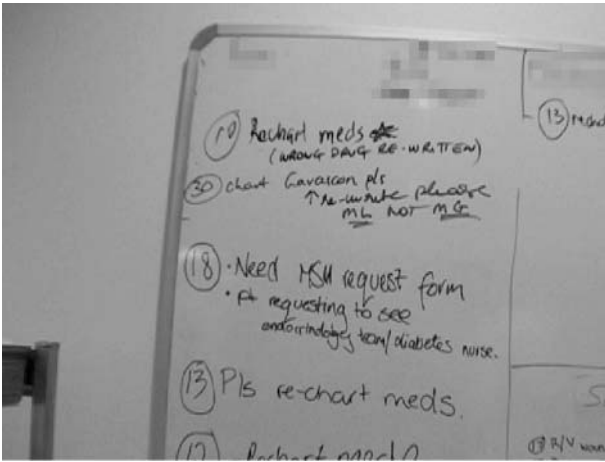


Figure 1. Whiteboard showing incorrect medication prescription

care, patient education, counseling, or follow-up with social supports were less commonly recorded than physiological aspects of patient care. Once tasks were complete, messages were erased by a nurse or doctor.

Apart from functioning as a communication method of relaying information, whiteboards also functioned as a technology of interaction. As discussed in the section that follows, nurses were able to manipulate the whiteboards to achieve efficiencies, but they were also able to resist surveillance of their work practices by controlling how (and how long) information was displayed on the whiteboards. Furthermore, whiteboards were also a means for displaying professional expertise, and for manipulating the boundaries of professional relationships.

4.2. Achieving efficiencies

Nurse coordinators were responsible for the daily operational management of operating room departments. They were in charge of allocating nurses to individual operating rooms and updating the whiteboard. Their job was to keep abreast of developments in the department such as when an operating list ran over the allotted time, when there were delays in surgical session starting times, when staff reported on sick leave, and when staffing skill mix was not appropriate for a particular session. Nurse coordinators altered the information documented on the whiteboard accordingly and worked toward achieving efficiency and effectiveness of the given human resources. This need to ensure efficiency and effectiveness became apparent in Hospital 1 as the following excerpt demonstrates:

(1) Researcher (R), Louise (L)

R: You look as if you are playing a board game—like moving the names around like checkers on a board or pawns in a game of chess.

L: I like to think of it as a stock exchange, sort of playing with resources. You know those men that run up and down changing the board as the prices change—you know, when they had the old fashioned stock exchanges not these electronic ones.

R: You mean chalkies?

L: Ye, that's them.

But more pertinent to this environment was the realization that nursing coordinators exercised hierarchical power through their use and management of the whiteboard. By manipulating and regulating the movement of people, nursing coordinators worked toward achieving efficiency and effectiveness of the given human resources, in a way that benefited nurses in the department, as the following field-note excerpt demonstrates:

(2) Louise (L), Researcher (R), Nurse (N)

I [researcher] found Louise [nursing coordinator] standing in front of the whiteboard with a group of nurses—about five in all. They were discussing who [which nurse] was meant to be in what operating room. When they had dispersed Louise said to me:

L: I don't know how that happened. Ingrid should be in Mr. Black's theatre and Angela should be doing urology. It's her cluster and Ingrid is bank [a casually employed nurse]—she is meant to fill in places where we are short and not work as a specialist.² She gets what she wants too much.

R: Can you change it now?

L: No, I think it's too late, but if I have my way it won't happen again.

And immediately following this interaction, another nurse walked up and said to Louise:

N: Louise, could Mary be changed to theatre 3 to work with Sue—she's her preceptor (pointing to the names of the whiteboard).

L: Yes—you can change that.

The field-note excerpt demonstrated the authority of the nursing coordinator, the power she exercised in sanctioning changes to staff allocations, and how whiteboards were used to discipline nurses in how they moved around the department. Nurse coordinators optimized the skills of individual nurses and made sure that nurses and technical staff with specialist knowledge of a particular branch of surgery, such as cardiac or orthopedic surgery, worked in their area of expertise. Efficiencies were also achieved by overseeing the development of inexperienced nurses and by assigning them to work with clinicians who were competent in particular areas. In the field-note excerpt, the nursing coordinator was lamenting the way in which the allocations had been arranged by another nurse coordinator as it deprived one clinician of the opportunity to work in her area of expertise.

In oncology wards, whiteboards achieve different kinds of efficiencies. Here, whiteboards were used to reduce direct interactions between nurses and doctors, which served to announce the distribution of nursing staff and thereby naturalize their clinical positioning. In both oncology wards, nurses were assigned by name to a number of patients who were recorded as bed numbers. For instance:

- (3) Joy 1-8
Christine 9-16
Emily 17-20

In the oncology wards, nurses assigned to more critically ill patients were often only allocated four patients, while nurses assigned to less seriously ill patients were allocated as many as eight patients to care for. It was usually the nurse unit manager, or the most senior nurse present, who determined the patient allocations and wrote them on the whiteboard at the beginning of each shift (morning, afternoon, and evening), according to the skills and experience of nurses who were working. Using the whiteboard in such a way not only enabled the nurse unit manager to organize staff, but it also helped doctors to identify and locate a nurse caring for a particular patient, should they need to ask details or request a particular task to be performed in relation to a specific patient. As such, this public display of the nursing allocations made nurses visible, both to their peers, occupational superiors, and also to other clinicians who needed to make contact with them.

4.3. *The whiteboard as contested space*

By the same token, in all environments nurses were able to resist surveillance of their movements in the department. They did so by manipulating the visible display of their name on the whiteboard. For example, in Hospital 1 a new whiteboard was installed in the main corridor of the operating room department—a very visible place. The purpose of this whiteboard was to allow the operating room department manager (who initiated the introduction of the whiteboard) to record important day-to-day practice issues, and to engage nurses and technical staff in the practice of putting up on the whiteboard the times when they left the department (for meetings, to pick up test results, and so forth) and when they returned (surgeons and anesthetists, in contrast, were not asked to comply with this directive). The manager, who was responsible for the ongoing strategic management of the operating rooms, wanted compliance with this strategy so as to be able to identify the number of people in the department should there be a need to evacuate in an emergency. That is, the directive was predicated on a discourse of safety. In practice, however, very few staff members, nursing or technical, acted on the directive. When interviewed, nurses and

technical staff noted that they saw it as a means of surveillance intended to regulate their movements. One member of nursing staff was heard to say to those next to her at a meeting: ‘this place is becoming more like an army everyday’.

Instead what happened was that staff began to ‘game’ the way the whiteboard was used. Once an operating session was complete, nurses sometimes erased their name from the whiteboard without informing the nursing coordinator, effectively making themselves invisible. By erasing their name, nurses avoided displaying where they should be located and avoided or delayed the possibility of being delegated another task by the nursing coordinator. Alternatively, nurses sometimes failed to inform the nursing coordinator that an operating list was complete, giving the appearance on the board that they were still fully occupied with operating room duties. In these ways, the whiteboard became a contested space, torn between the department manager’s desire to increase surveillance and nurses’ and technical staff’s ability to game the whiteboard’s visibility.

Similarly, at Hospital 2, during the study period a new whiteboard was erected in the main corridor, located in full public display of any staff that worked in the department. Listed on the board were cleaning and restocking duties for each operating room to be carried out by nurses. These duties included cleaning the anesthetic machine, restocking the anesthetic machine, cleaning the anesthetic trolley, restocking the anesthetic trolley, and restocking the setup room. It was stated on the whiteboard that when complete, the itemized duties were to be initialed by the nurse who had undertaken them. Nurses of all ranks, except for managers, were expected to participate. Nurses were annoyed, not only with having to complete the cleaning duties, but also with the public visual display of their individual compliance with the initiative. As one nurse said, when standing and looking at the board:

- (4) Nurse (N)
N: Holy hell! We must have been really naughty (shaking her index finger at the board). Not only do we have to fill in that we’ve done our work, we have to sign our name. I just feel like walking up to it and putting a big line right through it—‘No time’.

Using strong language (‘Holy hell’), this nurse expressed her disapproval of the nursing management initiative and how she would like to resist. It became obvious that other nurses also resisted the strategy, as was evident from the small number of cleaning duties that appeared to have been completed judging from subsequent writings on the whiteboard. Furthermore, the cleaning tasks that had been completed were marked with a tick rather than the required initials: a tick concealed the identity of the person

undertaking the cleaning, saving the person from being judged and scrutinized by the nursing coordinator.

Before the installation of the new whiteboard, lists of nurses' cleaning duties had been shielded from public view and kept in folders for nurses' use only. Apart from lists of cleaning duties, nurses used many different forms of stocking and checking lists to ensure that equipment was ready for use. However, the nurses viewed the introduction of the whiteboard as a means of checking completion of cleaning duties as punishment for previous noncompliance. The punishment took the form of making nurses' duties publicly visible, which aimed to enable anyone in the department to judge and objectify their colleagues as either compliant or noncompliant. The new whiteboard and the communication practices it stood for divided nurses: a tension was created between compliance with management and allegiance to professional nursing values according to which cleaning duties are de-meaning of nurses' training and status. Furthermore, the communication practices associated with the new whiteboard publicly reconfirmed the nurses in their role as 'housekeepers' rather than emphasizing their professionalism, again subordinating them to the traditional medical value system rather than confirming the emergence of multidisciplinary models of care.

In sum, whiteboards were intended as a means of organizing and disciplining nurses' work. The extracts above, however, highlight instability and the contested nature of the kinds of communication that were encouraged, which undermined the organizing function of the use.

4.4. Temporary demonstrations of expertise

The whiteboard, as a panoptic display, allowed nurses to demonstrate and make visible their expertise. Demonstrating expertise was apparent in different ways in both Study 1 and Study 2. In the oncology ward, nurses used the whiteboards to make their subjective knowledge of patients visible. For example, one inscription on the whiteboard read 'IVC [intravenous cannula]—too painful', as shown in Figure 2.

In this instance, the nurse writing the message stated that the current positioning of a patient's intravenous cannula through the skin was uncomfortable. Speaking on behalf of the patient, the nurse expressed her opinion that the amount of pain the patient was experiencing was unacceptable and that it was, in her opinion, imperative that the doctor address the problem by re-siting the intravenous cannula. Nursing judgment went beyond noticing that the patient was in pain to asserting a professional opinion that the degree of the patient's discomfort was such that it required a response from the doctor. In doing so, the nurse transformed her subjective judgment about how the patient's treatment should progress into a statement about what *must* be done for the patient. A similar judgment was apparent in the following inscription:

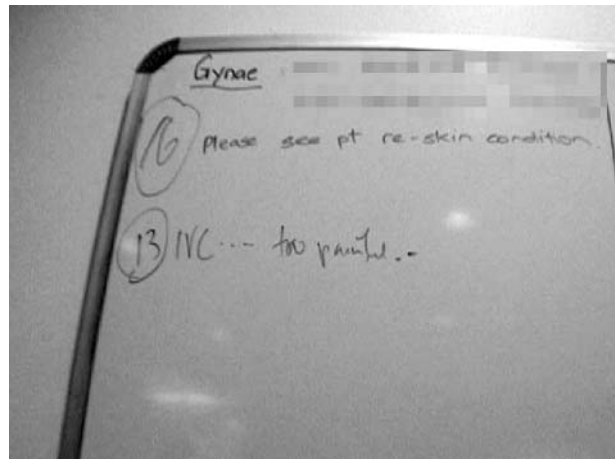


Figure 2. Whiteboard showing nurse's assessment of an intravenous cannula site

- (5) pls r/v hyoscine
pt feeling 'vague + dizzy' post 0600 dose

In the inscription above, the nurse was not only asking the doctor to review a patient's medication order, but had overtly displayed her scientific knowledge by reaching a diagnosis: it was the sedative (hyoscine) that had caused the patient to have an adverse drug reaction, demonstrated by feelings of vagueness and dizziness. The nurse was asking the doctors for an alternative treatment but had stopped short of suggesting exactly what this treatment should be, as this is the legal responsibility of medical staff. Nursing expertise was also demonstrated in the following two separate inscriptions:

- (6) Rechart meds *
(wrong drug re-written)
- (7) Chart Gavascon pls
↑ re-write please
ml not mg

In the first inscription, a nurse was asking the doctor to re-write the patient's medication chart, and placed a large asterisk next to the request in order to draw attention to the urgency of the task. The doctor had written the wrong medication on the patient's medication chart and the nurse was acting to police the doctor's practice, making the error public for all to read. In doing so, the nurse demonstrated her level of expertise, exhibiting not only her scientific knowledge about pharmacology but also her intimate knowledge of the patient's medical condition and the treatment required. Similarly, the second inscription refers to a patient's medication chart. The nurse was asking for a medication to be re-charted ('chart Gavascon pls'). This time, the doctor had written the wrong unit of measurement for the medication: the dose in a mass form 'mg' instead of a volume form

'ml'. The nurse demonstrated her superior knowledge, and once again used the whiteboard to maintain surveillance over and subtly intervene in the practices of medical staff.

On the whiteboards located in the oncology wards, this 'mediated surveillance' was even more evident. Here, nurses wrote in an imperative format bringing attention to the relevance and importance of the clinical task that needed to be performed. To counterbalance the urgency of their comments and the inappropriateness of their surveillance over doctors, nurses' whiteboard inscriptions were usually made anonymously, and directed toward an unidentified member of medical staff. The urgent and fact-based nature of the message contents, predominantly centering on errors in drug prescribing, also obviated the need for nurses to support their advice by supplying their name or initials. At the same time, however, the lack of identifying information contributed to the effacement of nurses themselves and the source of the knowledge informing the messages. What is more, once an alteration to a patient's medication regimen was recorded by the doctor on the formal, permanent organizational chart held in the patient's medical record, the message on the whiteboard was erased and any reference to the incorrect prescription was lost. Thanks to its information being able to be erased, the whiteboard contributes to rendering invisible nurses' role in surveilling the work of doctors and in maintaining patients' safety with regard to, in the present instance, medication prescribing.

Whiteboards were also used in operating rooms, but here they were exploited as a means to emphasize and display nursing expertise, albeit expertise of a different kind compared to that demonstrated by nurses on the oncology ward. Operating room nurses' expression of expertise was more centered on displaying an individual nurse's knowledge base associated with a particular form of surgery and with the kinds of nursing staff needed to perform it. In the operating rooms studied here, the whiteboard allowed nurses to examine the coordinator's staff allocations and to suggest changes that benefited the efficient running of the department, thus distributing the decision making about work organization. The nurse coordinator's competency as a logistics manager and author of the whiteboard was thus made visible, and this enabled others to assess, judge, and dialogue with the coordinator's inscriptions.

Indeed, the clinical nurses frequently questioned the appropriateness of the nurse coordinators' written allocations, at times directly challenging the coordinator's authority. In turn, operating room nursing coordinators tended to justify their decisions and take steps to resist these questionings. At Hospital 3, for example, a study participant related how nursing coordinators avoided displaying the staff allocations on the whiteboard until the last moment, leaving a paper copy of the allocations in their office and keeping the

allocations hidden to avoid scrutiny. These actions bear out that besides their ostensible functionality, the whiteboards and their public inscriptions led to tensions and contestations.

5. Discussion

In both the operating room and the oncology wards, whiteboards comprised a 'pseudo-synchronous' communication mechanism: they afforded communication 'at a distance', enabling separation of time and space between the sender and receiver of messages. Communicating at a distance has both functional and political consequences. From a functional perspective (Seagull et al. 2003; Xiao et al. 2001), the whiteboards acted as a central, focal point for the gathering of nursing, medical, and technical staff—a hub from which clinical activities were planned, instigated, contested, and controlled, providing certain efficiencies in communication. Health professionals took on the responsibility of seeking information from the whiteboard to find out 'what is going on?' The onus was on the intended recipient of the message to look for the information on the whiteboard.

Indeed, whiteboards reduced the burden of information dissemination for the initiator of the message by limiting the number of people to whom the same message would have to be repeated. As a consequence, in both settings whiteboards made it possible to avoid 'immaterial labor' (Hardt and Negri 2000, 2004)—the 'labor that produces an immaterial good, such as a service, a cultural product, knowledge, or communication' (Hardt and Negri 2000: 290). It is therefore also reasonable to surmise that whiteboards played a part in limiting interruptions that may occur as a result of synchronous methods of communication that require direct interaction, such as telephones (Spencer et al. 2004).

At the same time, the operating room and oncology settings utilized whiteboards according to the different communication priorities and needs of each clinical area. In operating rooms, whiteboards were commonly employed for ostensibly logistic purposes, to record the movement of staff, supplies, and the scheduling of cases, whereas in the oncology wards whiteboards were primarily used to display messages for medical staff regarding patients' clinical management. Here, nurses use whiteboards as an organizing device to manage clinical practice and their work routines. Just as nurses use the ritual of the ward round to order the context in which the patients' needs are dealt with (Latimer 1998), whiteboards here are artifacts that provide a nonverbal, visual means of putting order into clinical work.

We suggest that the different ways in which whiteboards were used in these two environments can be seen as a reflection of the different clinical logics that are at stake here. In operating rooms, work is

spatiotemporally concentrated, comprising intense, procedural work that requires very specific, complementary, professional contributions and expertise. In contrast, the environment in oncology wards is more open and dispersed than operating rooms and work is organized in a spatiotemporally extended way, with health professionals' expert contributions chaining together in more dynamic and complex ways.

These clinical environments use whiteboards differently according to the various biophysiological logics at stake. In operating rooms, whiteboards were deployed by nurses to play a game involving the identification of specific health professionals and hierarchical control. The panoptic (Foucault 1977) character of whiteboards, or the enabling of social surveillance, was made apparent by the fact that at any given moment, at a point removed from the place in which staff were working, an individual could stand in front of the board and observe what people in operating rooms were doing (vascular surgery, orthopedic surgery, etc.), whether the list was running late, and who was working in that operating room and with whom. Health professionals at all levels could scrutinize the movements and activities of their colleagues. As seen above, nurses judged the level of surveillance produced by the whiteboards to be restrictive, leading to their erasing or not recording their name or perhaps leaving it displayed longer than was necessary. In these ways, the nature of the inscriptions on the whiteboards was exploited by both managers and staff.

In oncology wards, the game played between health professionals involved interprofessional tactics and down-up control. This inverted panoptic orientation of whiteboards in oncology wards was moderated by the anonymity of the messages—the absence of the name of the sender or of the intended recipient of the message, in order to preserve the face of those ostensibly in power, the doctors. Nevertheless, the public, open display of directive messages to medical staff acted to influence their clinical decisions and practices. In the oncology wards, the communication recorded by nurses on the whiteboards was generally transposed by medical staff into a formal record of a medication order in a patients' chart—a legal document. The nature of the information recorded on the whiteboards was nonformal: this information only gained credibility and importance once the message or instruction was taken up by the doctors and reproduced in formal, organizational documents.

From a political perspective, whiteboards can be thought of as an 'unofficial' communication method in that there were no hospital policies or regulations governing when or where they could be introduced and used. In contrast, the development, introduction, and alteration of medical charts and formal hospital documents stored in a patient's record are subject to tight control and usually governed by an official committee process. The use of whiteboards was controlled

at the clinical level, dependent on the perceived needs of health professionals and managers in each department: whiteboards were a tool through which clinicians governed and controlled clinical events at the microlevel of practice (Foucault 1977, 1978). On this reading, whiteboards provide health professionals with a relatively autonomous method of mediating and controlling their own practices, independent of rather than subservient to organizational regulations and restrictions.

Precisely because they inhabit this underdefined space, we suggest whiteboards are able to affect the dynamics and complexity of interprofessional relationships and of social positioning in clinical settings, while circumventing face-to-face interaction. The public nature of the displayed information on whiteboards and the anonymity of messages presented nurses with opportunities to influence and manipulate intra- and interprofessional relationships. In the oncology wards, the overt display of messages noting incorrect or inadequate documentation of medication orders by medical staff brought to the fore nurses' surveillance of medical practice, as well as nurses' own expertise and knowledge of medicines. Nurses' use of whiteboards to display the policing of medical practice represents what Allen (1997) referred to as non-negotiated blurring of the boundaries between medicine and nursing. But it is the whiteboard's public but apparently marginal role in clinical care that makes it possible for its inscriptions to transgress traditional lines of clinical expertise and the hierarchical nature of the relationships between nurses and doctors.

For nurses, the credibility and authority of the information they contributed about medication management was mitigated by the impermanence of the ink with which the inscriptions were recorded and the fact that the initial message, the 'voice' of the nurse, was lost once the information was erased from the whiteboard (Parker and Gardner 1992). Historically, for nurses, the invisibility of their work has been problematic (Latimer 2000; Manias and Street 2001; Sandelowski 2000). The hidden aspects of care they provide at the bedside in attending to the body of the patient and building relationships are difficult to articulate and showcase as a distinctive endeavor. Organizing and managerial aspects of nursing work is generally undervalued (Latimer 1998). As we have shown, nurses are complicit in making their practices invisible insofar as they continue to rely on the whiteboard as marginal and pseudo-synchronous form of communication.

Seen from a broader perspective, the failure, or unwillingness, on the part of nurses to author their directives to doctors using more formal channels may be conceived as a strategy to avoid open conflict. Historically, the relationship between nurses and doctors has been portrayed as problematic with differences in gender, social class, and aspects of hierarchical control

structuring the interplay between the professions (Sweet and Norman 1995). In an attempt to influence clinical decisions within these traditional social boundaries, nurses resort to covert strategies that guide doctors to make specific, desirable decisions (Manias and Street 2001) in order to affect and influence practice. These covert strategies allow nurses to manipulate medical decisions and avoid open disagreement with doctors in a way that moves beyond confronting kinds of face-to-face 'symbolic violence' (Bourdieu 1991: 51). Whiteboards, in this sense, can be viewed as a mechanism through which nurses avoid direct challenges to interprofessional relationships, thereby perpetuating traditional positionings and hierarchies.

6. Conclusion

This paper has identified whiteboards as a crucial and central aspect of nursing and medical practice. It has been shown that at two sites, operating rooms and oncology wards, nurses use whiteboards as a resource to organize staff and communicate with other health professionals.

Communicating at a distance in a way that is erasable enables nurses to avoid the formalizing and permanent effects of medical chart notations as well as face-to-face confrontation with doctors whom they judge to have erred. Whiteboards reduce the immaterial labor that commonly complicates clinical decision making in the highly uncertain environment of the hospital. However, while on the surface whiteboards appear as an innocent, informal, and perhaps marginal communication tool, used 'merely' for the organization of clinical practice and logistics, closer analysis reveals that whiteboards are the site where complex intra- and interprofessional relationships are negotiated and managed. Besides providing a means through which staff can communicate rapidly changing kinds of information, whiteboards also provide a medium *par excellence* for clinicians to mitigate the symbolic violence that is incurred by challenging others face to face.

Our analysis foregrounds a complex set of interprofessional tactics, interactive norms, and taken-as-given silences. The analysis problematizes the notion not just of whiteboards being a functional, politically neutral apparatus for clinical communication and collaboration between health professionals (Seagull et al. 2003); it also challenges the idea that whiteboards are but a marginal component of contemporary forms of care. Our argument is that whiteboards play a central role in more ways than one. The temporary and public nature of the information that is recorded on whiteboards creates a hybrid space, allowing clinicians to communicate with each other from a safe distance. This enables them to mitigate the interpersonal politics of their intra- and interprofessional relationships, reinforcing traditional hierarchies and commu-

nication practices while also leaving space for gaming and subversion.

The communication at a distance that whiteboards afford renders them an important device in contemporary healthcare. Hospitals are sites where, due to the demands of service and scarcity of resources, relatively little effort has been expended on workplace culture and relationships. Whiteboards have a functional capacity in that they relay rapidly and flexibly changing kinds of information to a large number of people at a time. By the same token, our analysis shows that whiteboards also play a role in shielding clinical professionals for whom face-to-face negotiation of changing workplace relationships has not been a priority, and where traditions of workplace aggression and violence have not yet been fully reworked into more acceptable practices, involving the adoption of more self-aware and heedful forms of interaction.

Notes

1. Photovoice is otherwise known as photo-elicitation or photo novella. It is a method where photographs taken by participants, or supplied by the researcher or participants, are used as a catalyst to promote discussion.
2. A cluster is a group of surgical specialties, such as cardiac, vascular, and thoracic surgery, or gynecology and urology, in which the techniques of surgery are similar. In this type of rostering, nurses work in one cluster for a period to become familiar with the surgical techniques and equipment.

References

- Allen, D. (1997). The nursing-medical boundary: A negotiated order? *Sociology of Health & Illness* 19 (4): 498-520.
- Bourdieu, P. (1991). *Language and Symbolic Power*. Cambridge, MA: Polity Press.
- Cheek, J. (2000). *Postmodernism and Poststructural Approaches to Nursing Research*. Thousand Oaks, CA: Sage.
- Coiera, E. and Tombs, V. (1998). Communication behaviours in a hospital setting: An observational study. *British Medical Journal* 316: 673-676.
- Forsyth, R. (2006). Tricky technology, troubled tribes: A video ethnographic study of the impact of information technology on health care professionals' practices and relationships. Unpublished Ph.D. thesis, The University of NSW, Sydney.
- Foucault, M. (1977). *Discipline and Punish. The Birth of the Prison*. London: Penguin.
- (1978). *The Will to Knowledge: The History of Sexuality, Volume 1*. London: Penguin.
- (1979). Governmentality. *Ideology and Consciousness* 6: 5-21.
- (1982). Power and truth. In *Michel Foucault. Beyond Structuralism and Hermeneutics*, H. Dreyfus and P. Rabinow (eds.), 184-204. Chicago: The University of Chicago Press.
- (1984). What is an author? In *The Foucault Reader: An Introduction to Foucault's Thought*, P. Rabinow (ed.), 32-50. London: Penguin Books.

- France, D. J., Levin, S., Hemphill, R., Chen, K., Rickard, D., Makowski, R., Jones, I., and Aronsky, D. (2005). Emergency physicians' behaviors and workload in the presence of an electronic whiteboard. *International Journal of Medical Informatics* 74 (10): 827–837.
- Garfinkel, H. (1967). *Studies in Ethnomethodology*. Englewood Cliffs, NJ: Prentice Hall.
- Glass, N. and Davis, K. (2004). Reconceptualizing vulnerability: Deconstruction and reconstruction as a postmodern feminist analytical research method. *Advances in Nursing Science* 27 (2): 82–92.
- Hammersley, M. and Atkinson, P. (1997). *Ethnography. Principles in Practice*. London: Routledge.
- Hardt, M. and Negri, A. (2000). *Empire*. Cambridge, MA: Harvard University Press.
- (2004). *Multitude: War and Democracy in the Age of Empire*. New York: Penguin Press.
- Heartfield, M. (2005). Regulating hospital use: Length of stay, beds and whiteboards. *Nursing Inquiry* 12 (1): 21–26.
- Hutchins, E. (1995). *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Iedema, R., Rhodes, C., and Scheeres, H. (2005). Presencing identity: Organizational change and immaterial labor. *Journal of Organizational Change Management* 18 (4): 327–337.
- Latimer, J. (1998). Organising context: Nurses' assessment of older people in an acute medical unit. *Nursing Inquiry* 5: 43–57.
- (2000). *The Conduct of Care: Understanding Nursing Practice*. Malden, MA: Blackwell Science.
- Luff, P., Heath, C., and Greatbatch, D. (1992). Tasks-in-interaction: Paper and screen based documentation in collaborative activity. In *Proceedings of the 1992 ACM Conference on Computer-Supported Cooperative Work*, M. Mantel and R. M. Baecker (eds.), 163–170. Toronto: ACM Press.
- Manias, E. and Street, A. (2001). The interplay of knowledge and decision-making between nurses and doctors in critical care. *International Journal of Nursing Studies* 36 (2): 129–140.
- Mendonça, E. A., Chen, E. S., Stetson, P. D., McKnight, L. K., Lei, J., and Cimino, J. J. (2004). Approach to mobile information and communication for health care. *International Journal of Medical Informatics* 73 (7/8): 631–638.
- Parker, J. and Gardner, G. (1992). The silence and the silencing of the nurse's voice: A reading of patient progress notes. *The Australian Journal of Advanced Nursing* 9 (2): 3–9.
- Parker, J., Gardner, G., and Wiltshire, J. (1992). Handover: The collective narrative of nursing practice. *The Australian Journal of Advanced Nursing* 9 (3): 31–37.
- Riley, R. and Manias, E. (2003). Snap-shots of live theatre: The use of photography to research governance in operating rooms. *Nursing Inquiry* 10 (2): 81–90.
- (2004). The uses of photography in clinical nursing practice and research: A literature review. *Journal of Advanced Nursing* 48 (4): 397–405.
- (2006). Governing time in operating rooms. *Journal of Clinical Nursing* 15 (5): 546–553.
- Sandelowski, M. (2000). *Devices and Desires: Gender, Technology and American Nursing*. Chapel Hill: The University of North Carolina Press.
- Seagull, F., Plasters, C., Ziao, Y., and Mackenzie, C. (2003). Collaborative management of complex systems: Operating room schedule coordination. Paper read at the Human Factors and Ergonomics Society 47th Annual Meeting, Denver, Colorado.
- Spencer, R., Coeira, E., and Logan, P. (2004). Variation in communication loads on clinical staff in the emergency department. *Annals of Emergency Medicine* 44 (3): 268–273.
- Stanley, G. (1994). Intershift goes visual. *The Canadian Nurse* 90 (11): 49–50.
- Sweet, S. and Norman, I. (1995). The nurse–doctor relationship: A selective literature review. *Journal of Advanced Nursing* 22 (1): 165–170.
- Wang, C. and Burris, M. (1994). Empowerment through photo novella: Portraits of participation. *Health Education Quarterly* 21 (2): 171–186.
- (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health Education and Behaviour* 24 (3): 369–387.
- Xiao, Y., Kim, Y.-J., Gardner, S. D., Faraj, S., and MacKenzie, C. F. (2006). Communication technology in trauma centers: A national survey. *The Journal of Emergency Medicine* 30 (1): 21–28.
- Xiao, Y., Lasome, C., Moss, J., Mackenzie, C., and Faraj, S. (2001). Cognitive properties of a whiteboard: A case study of a trauma centre. In *Proceedings of the Seventh European Conference on Computer-Supported Cooperative Work*, W. Prinz, M. Jarke, V. Rogers, K. Schmidt, and Wulf, V. (eds.), 259–278. Bonn: Kluwer Academic Press.
- Robin Riley, R.N., B.A., M. N. Studies, Ph.D., is a Nurse Unit Manager of operating rooms at Box Hill Hospital in Melbourne and a senior fellow at the University of Melbourne, Australia. Her research interests include interpersonal and organizational communication, interprofessional relationships, and patient safety. She has published in several journals, including *Social Science & Medicine* and *Quality & Safety in Health Care*.
- Rowena Forsyth, B.A. (Hons), Ph.D., is a medical sociologist with experience in hospital-based ethnographic research. Rowena's doctoral thesis was on organizational dynamics within which practices of laboratory test ordering are embedded and the impact of new computerized information technology on relationships between doctors and laboratory scientists at a metropolitan teaching hospital. She is now Researcher on a National Health and Medical Research Council funded project at St. George Hospital in South-Sydney, Australia.
- Elizabeth Manias, B. Pharm., M. Pharm., R.N., M. N. Studies, Ph.D., is a registered nurse and a pharmacist. She is employed as an Associate Professor at the School of Nursing at the University of Melbourne, Australia. Her research endeavors include medication safety, interpersonal and organizational communication, and consumer participation. Specifically, her work considers different individuals' perspectives and the complexities of the dynamic environment in which communication takes place. Address for correspondence: School of Nursing, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Level 1, 723 Swanston St Carlton 3053, Australia. E-mail: emanias@unimelb.edu.au
- Rick Iedema, B.A., M.A., Ph.D., is Professor of Organizational Communication, Associate Dean (Research), Faculty of Humanities and Social Sciences at the University of Technology, Sydney, Australia. His research targets the organization of clinical work in hospitals, and he has published in journals such as *Social Science & Medicine*, *Organization Studies*, and *Communication & Medicine*.