Title: To follow a rule? On frontline clinicians' understandings and embodiments of hospital-acquired infection prevention and control rules

Abstract

This article reports on a study of clinicians' responses to footage of their enactments of infection prevention and control. The study's approach was to elicit clinicians' reflections on and clarifications about the connections among infection control activities and infection control rules, taking into account their awareness, interpretation, and *in situ* application of those rules. The findings of the study are that clinicians responded to footage of their own IPC practices by articulating previously unheeded tensions and constraints including: infection control rules that were incomplete, undergoing change, and conflicting; material obstructions limiting infection control efforts; and habituated and divergent rule enactments and rule interpretations that were problematic but disregarded. The reflexive process is shown to elicit clinicians' learning about these complexities as they affect the accomplishment of effective infection control. The process is further shown to strengthen clinicians' appreciation of infection control as necessitating deliberation to decide what are locally appropriate standards, interpretations, assumptions, habituations and enactments of infection control. The article concludes that clinicians' 'practical wisdom' is unlikely to reach its full potential without video-assisted scrutiny of and deliberation about *in situ* clinical work. This enables clinicians to anchor their *in situ* enactments, reasonings and interpretations to local agreements about the intent, applicability, limits and practical enactment of rules.

Key words: video-reflexivity, rules, infection control, patient safety, embodied practice, practical wisdom, abduction

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Introduction

> What could 'The rule according to which a person proceeds' possibly mean? (Wittgenstein, 1953: par 82e)

Health care improvement and patient safety rely to a significant degree on guidelines, protocols, standards and policies to structure and improve practice. In essence, guidelines, protocols, standards and policies are rules with which we seek to guide and govern health professionals' decisions and behaviour. The question of how rules regulate, justify, inform, or minimally affect or relate to *in situ* action has attracted sustained theoretical, methodological and pedagogic attention (Bittner, 1965; Dewey, 1922; Garfinkel, 1967; Suchman, 1987; P. Winch, 1958). Whatever their differences, commentators are agreed on two things: formal, explicit rules are not sufficient in and of themselves for guiding or judging human conduct, and rules are as likely to be invoked opportunistically and *post hoc* to legitimate actions as they are invoked *a priori* to steer decisions and actions (Hughes, 1989).

Wittgenstein's question with which our article began highlights a third complex facet of human activity (Wittgenstein, 1953). For him, rules structure and inform social customs (as in 'providing information and form to') (Wittgenstein, 1953: par 82e). Rules do this not principally as explicit guides or directives, but as implicit, taken-for-granted habituations whose origin, entanglement and logic may not be easily, or not at all anymore, retrievable (Pleasants, 1999). These habituations are therefore rule-bound, but in ways that may no longer be conscious and deliberate.

When applied to health care, this theoretical account needs to be contextualised with three additional practical challenges. The first is the exponential rise in the number of formal rules that is being imposed on professionals and their conduct, raising the issue for professionals of how to keep up with what is current. The second is rising health care system complexity (Dekker, 2014), and this points to the challenge of how to apply rules in increasingly variable and uncertain circumstances. Third, there is the proliferation of rule *functions* (Amalberti,

2001), which complicates how professionals are to understand the practical relevance of any given rule: is the rule advisory or mandatory?, and, does the rule apply to all cases or only a specific sample? Given these complexities, uncertainties and challenges, it is noteworthy that "in health care we've allowed 'quality' to be defined as compliance with evidence-based practice guidelines" (Lee, Porter, & Larsson, 2016). Indeed, the pursuit of healthcare safety still largely relies on proliferating and disseminating evidence with the aim to broaden the remit of practice directives (rules) and compliance audits (rule monitoring) (Shekelle et al., 2013).

We should recognise too however that there is now more acknowledgement among healthcare researchers and consultants that "skilled work requires a variety of different kinds of engagement with rules that do not have very much to do with their mechanical application" (C. Winch, 2006: 420). In their latest book, Vincent and Amalberti applaud "the adaptive capacities of staff in scenarios that fall outside guidelines, rules and regulations" (Vincent & Amalberti, 2016: 32). This re-appraisal of situated human action shines a light on frontline actors' everyday behaviours, *in situ* decisions, and creative innovations (Gabbay & Le May, 2010). However, the question of how *in situ* practice interfaces with rules still receives contradictory answers, ranging from managerialist directives that practice be evidence-based (Sackett & Rosenberg, 1995), to dystopian views of the inertia of clinical culture (O'Connor, Sperl-Hillen, Johnson, Rush, & Biltz, 2005), and renewed faith in professionals' practical wisdom and resilience (Reason, 2004).

The present study addresses the question we just posed by investigating how health care professionals *themselves* negotiate the relevance, application and enactment of rules *in practice*. The study did not gauge professionals' behavioural rule compliance, nor did it map their views on the effectiveness and applicability of specific rules. Instead, the study involved professionals in a feedback process using video footage of their *in situ* enactments of everyday care processes (Iedema et al., 2015). The study extends previous video-reflexive ethnographic studies by exploring clinicians' awareness of and learning about their own infection prevention and infection control (IPC) rules and practices. The larger study of which the present one was a component sought to measure the effectiveness of video

feedback on hospital-acquired infection rates, and its results are currently being prepared for publication (Gilbert et al., in preparation).

The next section of this article starts with an exploration of how professionals' behaviour has been regulated with the aim of reducing hospital-acquired infections. The section then shifts gear to consider how the relationship between rules and practices has been construed in the broader literature. Following that, the article presents an analysis of how members of a clinical team reflected on video footage of their own infection prevention and control practices, and how they invoked and discussed rules. The article's discussion section distils from this analysis the main finding that clinicians' 'practical wisdom' reaches its full potential only when they are enabled to scrutinise and deliberate how their habituated enactments of infection control measure up against formal standards and their local assumptions, interpretations and agreements. The article's conclusion draws out the implications from this finding for how healthcare improvement and infection control need to reframe the functionality of rules and their relevance for practice.

Rules in and as practice

Infection prevention and control (IPC) rules have proliferated since the 1970s (McLaws, 2015). This is justified on the ground that hospital-acquired infection (HAI) poses a growing threat to quality-of-life and incurs spiralling economic costs, leading the WHO to rank hospital-acquired infection prevention and control among the top five patient safety priorities (World Health Organisation, 2008). Yet, while hand hygiene plays an important role in reducing HAI, it is also clear that "hand hygiene alone cannot singularly inhibit the influence of formidable risk factors such as HAI acquisition at an older age, admission to the ICU, length of stay longer than average, or the fourfold increased risk of infection in patients colonised with *S. aureus*" (McLaws, 2015: 14). The complexities inherent in these latter risk factors mean that "[a]ttempts to prevent HAIs, specifically bacteraemia, require multiple concurrent interventions" (McLaws, 2015: 14).

In spite of these complexities now being acknowledged, hand hygiene directives and audits still dominate in how we seek to mitigate HAI risk (Pittet, Boyce, & Allegranzi, 2017). Because "[h]ealthcare-associated infections do not carry fingerprints [making it impossible]

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to identify the offending healers who failed the patient" (Palmore & Henderson, 2013), exhaustive rule compliance (read: blanket hand hygiene discipline) is still regarded as the solution *par excellence* for lowering HAI rates.

It has also been argued however that not compliance *per se* but a more context-sensitive approach to limiting cross-infection is called for. Krein and colleagues, for example, regard the lowering of HAI rates to require "a positive emotional and cultural context, as evidenced by a strong emotional commitment to patients, a unified culture focused on patient care, and active and engaged clinical leadership" (Krein et al., 2010: 1698). And indeed, turning our attention from rule to context makes sense if we consider that a rule needs to be made relevant and turned into action in real time. The problem here is that "[i]nstruction in what to do next can never come from an infinite goal [i.e. a rule], which for us is bound to be empty. It can be derived only from the study of deficiencies, irregularities and possibilities of the actual situation" (Dewey, 1922: 199).

Dewey's statement implies that rules are inevitably apprehended "against a background of what is taken for granted" (Taylor, 1993: 167). That is, rules are only comprehensible and enactable thanks to our familiarity with their context of provenance, or the *form of life* from within which the rule emerged, and as part of which it is supposed to be realised. Understandably, someone's lack of familiarity with the rule's background - the form of life to which the rule belongs – means they may lack in ability to act according to the rule (Collins, 2001).

This point about the rule being embedded within and emerging from a taken-as-given background is related to another point, which is that behavioural conventions and regularities need not arise from explicit rule-based guidance or prescription. That is, much if not most of our conduct's 'background' is not actually constituted in fully articulated knowledge. This means that the background is not a store of knowledge and explanations: "it isn't the locus of resolved questions" (Taylor, 1993: 167), and much of what I do "is simply what I do" (Wittgenstein, 1953: §217).

'This is simply what I do' is not susceptible to explicit prescription (and proscription) because much of what I do "is largely inarticulate [and] bodily" (Taylor, 1993: 170): it is anchored in taken-as-given routines, habituations, or "patterns of appropriate action". Their appropriateness does not arise principally through reasoning, but through an "unformulated practical grasp on the world" (Taylor, 1993: 170) where "reason-giving has a limit, and in the end must repose in another [non-linguistic] kind of understanding" (Taylor, 1993: 179).

The foregoing challenges the ways in which rules and in situ conduct have been discussed in health care research and improvement on two fronts. First, it explains why explicit rule directives are poor at changing practice and guiding behaviour (Ovretveit, 2011). Such rules appeal to explicit reasoning and judgment, and they are therefore incommensurate with the habituated background logic that underpins conduct arising as 'this is simply what I do'.

Second, the above statement that 'this is simply what I do' is rooted in what Taylor (1993: 170) termed our "unformulated practical grasp on the world". In health circles, this 'practical grasp' has been celebrated as "error wisdom" (Reason, 2004: ii31) and "local wisdom" (Berwick, 2008: 1184). This 'practical grasp' is also applauded in the 'work as done' literature, where "clinicians successfully adjust what they do to match the conditions [and where] front-line staff facilitate and manage their work flexibly and safely, instead of insisting on blind compliance or the standardization of their work" (Braithwaite, Wears, & Hollnagel, 2015: 419). Advising against a critical view clinicians' practical conduct, this literature instructs us to appreciate the "great deal of success in things going right" (Braithwaite et al., 2015: 420).

This change of heart, shifting from a focus on problems, shortcomings and incidents to an appreciation of clinicians' 'practical wisdom', acknowledges only one aspect of Taylor's claim however: because rules may be deeply rooted in people's background, their behaviour can display a natural ease. It was this that led Aristotle to coin the notion of *phronesis* (Aristotle, 1999), or 'practical wisdom'. There is a second aspect of Taylor's claim that the notions 'wisdom' and *phronesis* tend to camouflage however. That is, people's own background and thus their reasons for acting in practical ways in particular circumstances may not (or no longer) be readily apparent and accessible as a result of habituation. Here, it

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is important to recognise that habituation is that realm of rule-bound behaviour that neither springs from automatic reflex (such as the knee-jerk reflex), nor from fully conscious reasoning. That is, "between the poles of blind, physical mechanism, and conscious, deliberative reason there exists in human behaviour a wide realm of habit that is automatic and unreflective but nonetheless purposively intelligent and often skilled" (Shusterman, 2012: 162).

The present study keys in to the challenge of professionals not necessarily being in conscious control of the rule-following that informs and structures their practical conduct. Instead of negotiating conduct purely through the medium of explicit language, the study engaged participants with video footage of their own *in situ* ways of working to enable them to retrieve habits from being taken as given. Previous studies have shown that video footage of *in situ* practice connects study participants to dimensions of their own ways of working that they tend to take for granted (Iedema, Mesman, & Carroll, 2013). In what follows, we turn to the as yet unexplored domain of hospital-acquired infection, and analyse how frontline clinicians engaged with such footage capturing their enactment of infection control.

Method

This study was deployed in two metropolitan teaching hospitals and 177 participants agreed to be involved: 87 in an intensive care unit (ICU) in Hospital A (50 nurses, 21 doctors, 4 allied health practitioners and 12 administrative or cleaning staff), and 90 in two mixed surgical wards in Hospital B (57 nurses, 23 doctors, 5 allied health practitioners, and 5 administrative or cleaning staff). The study focused on video-recording clinicians' everyday practices where infection was or might be an issue, and on involving them in viewing and discussing edited sections of the resulting footage. The video-recording and reflexive sessions took place over periods of 3 months in Hospital A and over six months in Hospital B. A total of 23 reflexive sessions were conducted in all (5 in Hospital A, 18 in Hospital B), ranging from 3 to more than 20 staff per session. These reflexive meetings were also video-recorded. See Box 1 below for more detail about the video-reflexive process. The video-reflexive process was supplemented with ethnographic observations and 46 semi-structured interviews with a range of staff (30 in Hospital A, 16 in Hospital B).

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Box 1: Stages for the deployment of video-reflexive ethnography

Stage	Focus	Description
1	Recruitment	Management support was obtained at participating sites. Following which, the researcher (an experienced hospital ethnographer) developed trust relationships with the clinicians through a series of meetings with front-line staff in each participating unit to explore their understandings of the video method, the ongoing process of consent, and any practical issues that they thought worthy of being videoed.
2	Videoing practices and 'fast feedback'	Through consultation with participating staff, a range of clinical practices were video-recorded. Footage was usually shown back to those featured after the videoing. This fast-feedback engaged participants in determining what other practices would be videoed; what footage would be shown to their colleagues, and also to consent to the footage being shown to others.
3	Selecting and editing video clips	Based on the input of participants' and researchers' insights from observations and interviews, compilations of video clips were created to showcase a range of routine practices involving infection prevention and control, practices that participants flagged as important or interesting, and footage that demonstrated practices as more complicated or varied than usually described. Clips used for feedback were not more than 2–5 minutes long. Before being shown in public, clip selections were tested one-on-one with those featured, as well as on-site champions to ensure no sensitive actions or behaviours were going to be shown and no relationships were going to be jeopardised.
4	Reflexive sessions	Selected clips were presented at reflexive sessions, open to all staff working in the participating units. These sessions were

		designed to be multi-disciplinary, but most (11 out of 18) involved only single professional groups attending (e.g. nurses, infection control professionals, or doctors), albeit of different levels of seniority. The multi-disciplinary sessions involved a mix of doctors, nurses, infection control practitioners and administrative staff. All sessions were video and/or audio-recorded to capture the groups' responses and interactions. Researchers facilitated the discussion by inviting participants to explore the practices featured in the video clips, as embedded within the context of the unit. They invited participants to comment on the infection risks of what they observed, to explore the contextual factors behind these risks, and to share or develop strategies and solutions to counter these risks.
5	Consolidating change	Any changes that were devised during reflexive sessions were recorded by researchers and followed-up over time. Further sets of feedback meetings with participants, particularly senior staff and management, were held with the purpose of assessing the feasibility, impact and sustainability of suggested strategies and solutions.

The present article draws on these four sources of data: video footage, ward observations, and transcripts of the reflexive meetings and field interviews. Video-reflexive ethnography (Iedema et al., 2015) was chosen as a method to enable researchers and practitioners to engage with people's explicit understandings about practice as well as with their taken-as-given enactments of *in situ* practice.

The analysis applied to the data centred on identifying themes that were of interest to clinicians, particularly those which generated more than ordinary amounts of discussion during the reflexive meetings and afterwards on the wards. In effect the analysis unfolded 'abductively'. A "form of reasoning through which we perceive the phenomenon [to be]

related to other observations", abduction is neither deductive nor inductive, but interpretive and inventive of new perspectives (Timmermans & Tavory, 2012).

In the case of the present article, abductive reasoning was applied to how clinicians responded to and explained what they witnessed (their own activities shown in the footage). Here, abduction was practised with those attending the meetings through the researcher's questioning to encourage group sense-making. Following on from this, the research team proceeded to 'abduct' a more general description – the present article – about the study's journey into the pragmatic and rule-oriented aspects of infection control practice. This abductive process began with a thematic and content coding of all reflexive session and interview transcripts, followed by several iterative discussions about the data among the research team.

Ethics approvals for this study were obtained from the Western Sydney Local Health District Human Research Ethics Committee (ID: 2011/3/4.9 (3278)AU RED HREC/11/WMEAD/34) and from investigators' respective universities. Due to the unusual nature of the project, consent was sought at multiple points during the study. Study information was distributed through one-page handouts on information boards and via email. Written consent for observation, interviews and videoing were then obtained in person after negotiation with individual participants. Researchers also sought verbal consent prior to videoing and again afterwards, before clips were shown to different audiences such as colleagues or management. Participants were able to ask for video recording to be stopped at any time, and they could withdraw from the project at any time.

Findings

As described above, video-recording was focused on routine everyday IPC activities, and the use of gloves as personal protective equipment was found to be one of the most prominent aspects for nurses, second only to hand hygiene. The reflexive sessions therefore regularly involved clinicians commenting on themselves and colleagues using gloves for a range of patient care activities. Three issues pertaining to glove use in particular were discussed during these meetings: 1) the actual cleanliness of 'clean' gloves; 2) using sterile gloves for

doing dressings; and 3) using gloves for sub-cutaneous injections. We detail each of these in what follows.

1. The actual cleanliness of 'clean' gloves

Viewing the footage led the clinicians to comment on a number of practical constraints affecting their use of non-sterile 'clean' gloves. The first constraint related to the application of hand hygiene before donning clean gloves. Current national hand hygiene guidelines (NHMRC, 2010) require health care professionals to either wash their hands or use alcohol-based hand rub prior to wearing gloves so as to minimise contamination from dirty hands to the (relatively) clean gloves. In extract 1 below, doctors (Dr1, Dr3) and an infection control practitioner ('ICP') responded to footage of one of them donning gloves after using alcohol-based hand rub:

> Extract 1 – Doctors and nurse, reflexive session
> Dr3: I have to be very careful, the thing is though, [the alcohol solution] doesn't dry quickly.
> ICP: Yeah.
> Dr1: Yeah, and trying put gloves on after is hard.
> Dr3: There it goes [commenting on how the glove tears].
> Dr1: Snap!

Here, the problem of donning gloves with wet hands (after using the alcohol-based hand rub) was commented on. Wet hands mean that the gloves might break. A second constraint was the inconsistent availability of hand rub. In extract 2 below, a clinical nurse educator ('CNE') and a nurse ('N5') commented on footage of a nursing colleague delivering a heparin injection. The specific issue here was that the nurse was not able to do hand hygiene and don her gloves at the patient's bedside (after moving the curtains) because it lacked a handrub station:

> Extract 2 - Nurses, reflexive session
> CNE: ... you've got to be doing the hand hygiene and then putting on your gloves and then dealing with your heparin. OK?
> […]
> N5: Well, they've got the little hand rubs at the bedside anyway.

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CNE: But that bed didn't have one.

A third constraint that was commented on in response to footage of a nurse doing a dressing, is that 'clean' gloves, available in open boxes at the entrances to patient rooms, may not in fact be clean due to how these gloves are handled (extract 3):

Extract 3 - Nurse, reflexive session

[Regarding the 'clean' gloves] they're just the clean ones. You never know where they've been. And sometimes, when you want to pull one of them, [out] comes like ten or twenty and they just put them back. And you've already touched them with your hands.

Separately, in a discussion based on footage of a doctor examining a patient, a doctor echoed the assessment that 'clean' gloves may not in fact be clean (extract 4):

Extract 4 - Doctor, reflexive session

I don't trust the gloves either. I don't want the patients to get whatever festy, contaminated things other people have put in the glove box.

In effect, the footage of these routine aspects of patient care enabled the participating clinicians to articulate the various ways in which the rule pertaining to hand hygiene prior to glove use was compromised in practice. Gloves tear when used on wet hands, alcohol-based hand rub may not be easily accessible, and gloves may already be contaminated in their storage boxes prior to use. Being given the opportunity to articulate these practical and contextual constraints, clinicians became aware of their ubiquity, persistence, and significance.

2. Sterile or non-sterile gloves for dressings (or no gloves at all)

Another aspect of infection control that attracted considerable comment related to which gloves should be used when changing wound dressings. The current policy in the ward required nurses to use sterile (rather than ordinary *clean*) gloves for all dressings, whether minor or complicated. The donning of sterile gloves was also to be preceded by a longer and more thorough hand washing procedure than usual. In their feedback session however, clinicians articulated divergent views in response to a clip of a nurse carefully carrying out

an uncomplicated dressing change on a patient. The nurse used sterile gloves and applied a 'no touch' aseptic technique. The team's divergent views revealed a number of tensions: the sterile glove rule was not known to everyone on the team; some clinicians were following superseded rules, and the rule was not understood in the same way by everyone on the team. Internal disagreement arose about whether sterile gloves were unnecessary and time-consuming, and whether normal clean gloves would suffice here in combination with the 'no touch' technique (extract 5; Nurses N4 and N9):

> Extract 5 - Nurses, reflexive session
>
> N9: [...] it's not necessary to use sterile gloves, not unless you're [gestures prodding into wound] …
>
> N4: Directly touching the wound…
>
> N9: Yeah, directly touching the wound and whatever.
>
> N4: You can you still wear the normal gloves and use the forceps.
>
> N9: That's right and no-touch.
>
> N4: [...] If you're good at it…

Another nurse then insisted that donning sterile gloves was imperative (extract 6):

> Extract 6 - Nurse, reflexive session
>
> [When you do dressings you have to use sterile gloves] Just to protect the patient. He [has] already had enough. You don't want to make… cause him more infection or complications. [...] And it's easier by the way. [...] Because if you use just the blue gloves, it's just clean, non-sterile. And you have to use the forceps or the tongs … but with the sterile gloves it's much more easier. Of course before … first you have to clean the whole area so you don't have to touch anything dirty.

During subsequent discussions some days after the reflexive sessions, other senior nurses suggested instead that gloves were unnecessary for doing dressings, and that only hand hygiene and a no-touch technique should suffice. Then they acknowledged also that it was easier for less-experienced staff to use sterile gloves until they mastered the no-touch technique.

In sum, the rule regarding the use of sterile gloves for dressing changes was not interpreted in the same way, and the rule was not deemed to be constant, but was made contingent on training and experience. The nurse ('N3') speaking with the researcher ('R') in extract 7 below was of the opinion that it was entirely a matter of personal choice, depending on the kind of dressing and the kind of wound:

> Extract 7 – Nurse and researcher, reflexive session
>
> R: So, why do you think people use sterile gloves if they don't have to?
>
> N3: Oh, it's personal choice.
>
> R: Personal choice?
>
> N3: Yeah. And it depends on how big the wound is as well, affects when I use sterile gloves.

In contrast to the practical constraints affecting the hand-hygiene-before-gloving rule, here we encounter the challenge of clinicians' divergent understandings and embodiments of a rule leading to variable practices and conflicting rationales. These discussions focused participants' attention on differences in interpretation and practice that were normally ignored, and that became apparent only thanks to being enabled to review and deliberate these issues in relation to *in situ* practice.

3. To glove or not to glove for injections

This third issue relates to whether or not gloves should be worn when giving subcutaneous injections. The relevant discussion occurred in response to the clip referred to above where a nurse wore ordinary clean gloves to deliver a routine heparin injection, but then touched the curtains with her gloved hands (thus contaminating her gloves) prior to delivering the injection. During the discussion that followed, various strategies were offered by participants on how to avoid such contamination – including a method of wearing a glove on one hand while using the ungloved hand to close the curtain. A clinical nurse educator then proceeded to argue that gloves should be worn on both hands to protect the clinicians from exposure to bodily fluids (extract 8; Nurse N11, Researcher R, and clinical nurse educator CNE):

Extract 8 - Nurses, reflexive session

N11: If I'm going to do heparin, I never use both gloves. I use only one glove, on my non-dominant hand … with my ungloved hand you can pull the curtain, because that's not what I'm going to touch the patient, with my glove, my non-dominant hand. And I'm not going to touch, though I'm touching the syringe, but I'm not going to touch the patient as such. So… for me I've been doing it for years now.

R: How does that sound to everyone else?

CNE: Well, you're at risk of bodily fluids so you should be wearing your gloves on *both* hands.

Another nurse (N9) responded by challenging the rule that was implicitly referred to by the clinical nurse educator (CNE; extract 9):

Extract 9 - Nurses, reflexive session

N9: I don't think that it is protocol that we have to wear gloves whenever you give an injection. Is that a protocol? It's not a protocol. It's not a protocol.

CNE: It isn't?

N9: It's not a protocol.

The clinical nurse educator (CNE) then offered the example of how new nurse graduates are taught to use gloves when preparing antibiotics to support her argument for the use of gloves when giving injections. Gloves enable clinicians to protect themselves from antibiotic exposure (as parallel to bodily fluid exposure – in this case, blood). The clinical nurse educator's account was subsequently contradicted when recent nurse graduates shared that they were in fact taught not to wear gloves at all, unless patients have MRSA or require contact precautions (extract 10; N3, N5, N9, N11; Researcher R, clinical nurse educator CNE):

Extract 10 - Nurses, researcher, reflexive session

N3: What we got taught is only MRSA… only MRSA patients or the ones that require PPE… where we have to wear […] gloves. But then if it is a normal patient and it's just an injection or anything, we're not supposed to wear gloves.

[…]

N5: Yeah, that's what we got taught as well.

[…]

N3: You can […] just wash your hands and you're not allowed to wear gloves unless or until it is contaminating the patient or yourself.

[…]

R: You're not allowed to wear gloves even?

N3: Well, that's what they say. We're not allowed. Only when…

N9: I don't think you're not allowed. If you want to protect yourself, I'm sure you can use it.

CNE: [It's] preference.

[…]

N9: But it's not a policy.

N3: Yeah, I'm not sure. But when we do our practicals, they… our… facilitator whatever, she doesn't allow us to wear gloves. And then she will ask you, "Why are you wearing gloves? Is she going to contaminate you? Are you going to contaminate her?"

N11: Yes. But what I mean is, you need to ask your facilitator what happens if that patient, especially when you have an old patient who is on warfarin, once, even if it is a sub-cut injection like heparin or Clexane, they might start bleeding. And then what, instinctively, what are you going to do? Try with alcohol swabs with your bare hands – if you don't wear gloves – try to press on it. But that's where you have to wear a glove.

[…]

R: So, why did your… did your facilitator explain why you're not… supposed to wear gloves?

N3: Well, apparently, I'm not sure if it's a policy or it's practice but… like, they try and avoid the whole system of wearing gloves a lot.

N9: All the time.

N3: All the time, because you realise that people, what they say about… like, as new students, is we're so… just so afraid to touch everything, you end up just wearing gloves, gloves, gloves, all the time. So, she said that like when you're on the ward, try and avoid wearing gloves unless or until it is necessary.

Those present at this meeting were now acutely aware of the variability in interpretations and enactments pertaining to gloving. Unhappy with this variability, the clinical nurse educator proceeded to consult the practice manual on giving subcutaneous injections and glove use. She found an ambiguity in the rule pertaining to gloving: gloves were listed in the equipment required, but they were not mentioned anywhere in the step-by-step procedure. She may have been correct nevertheless in stating that gloving is required, since current national IPC guidelines prescribe the wearing of gloves for "any activity that has been assessed as carrying a risk of exposure to blood, body substances, secretions and excretions" (NHMRC, 2010: : 52). What made this situation more complex again was that the service's manual for infection control was being revised at the time (to stay aligned with

the 2009 WHO guideline http://www.ncbi.nlm.nih.gov/books/NBK144047/) to recommend against glove use when giving subcutaneous or intramuscular injections, because the risk of fluid exposure was deemed to be minimal.

It is not surprising, given these changes, tensions and contradictions, that when this information about the compulsory gloving rule was related to senior nurses at a subsequent reflexive session, a senior nurse expressed concern and opposition, to the point of suggesting he would be prepared to challenge the protocol and procedure committee (extract 11; Nurse N4, Researcher R):

> Extract 11 - Nurse, researcher, reflexive session
>
> N4: any [procedure] that would give me a chance of getting a needle-stick injury, I would be putting gloves on.
>
> R: Right, so, even if that was different to what the manual suggested?
>
> N4: Yep. Why put yourself at risk for… to give an injection.
>
> […]
>
> R: So, how do you handle it then if a policy actually does say you shouldn't?
>
> N4: We take it back to the policy and procedure committee and say you disagree with it.

In sum, clinicians found that there was variability not just in rule knowledge and rule enactments, but also in the origins of rules (personal, local, national, international) and in their specifications. They also realised that rules could be problematic, inappropriate, and in need of reassessment and rearticulation.

Discussion

Clinicians' responses to the video footage revealed that glove use was challenging on three fronts. Gloving rules:

1. could be constrained or complicated by practical circumstances making it difficult or impractical for clinicians to observe them or rendering their use ineffective;

2. could be understood, taught, interpreted and/or enacted in different ways by different people; and

3. could themselves be incomplete, contradictory or in flux, to the point of defeating people's effort to establish what exactly are 'the correct rules'.

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Our analysis of clinicians' responses to the footage proceeded abductively to conceptualise how clinicians determine and negotiate the bases and logics of their own ways of working. What became apparent was that *in situ* practice – that is, clinicians' 'practical wisdom' - was problematised when reviewed and discussed among the clinicians themselves. They became aware of previously unnoticed internal inconsistencies in institutional rules, of routinely ignored and taken-for-granted material obstructions, and of potentially unwarranted as well as justifiable divergences among practitioners' interpretations and *in situ* practices.

The video-reflexive process made clear for the clinicians that they had allowed these matters to remain 'in the background', leaving them unaddressed and unquestioned. As such, they recognised that even in circumstances where "things go right" (Braithwaite et al., 2015: 419), things may in fact not 'be right' at all. In the quality and safety literature, judgments about whether clinicians are capable of providing safe care are strongly divided. As Zinck Pedersen points out (2018), the 'human factors' literature tends to highlight clinicians' shortcomings. Human factors are unreliable factors: they include deficiencies in human thinking and acting, and call for people's thinking and acting to be channeled, constrained and monitored. This explains the human factors literature's focus on policies, checklists and guidelines (i.e. rules) as foundational solutions. On the other hand, there are the resilience enthusiasts for whom "things go right". In their eyes, clinicians possess an inherent capability to determine when it is appropriate to apply (or break) a rule. Their argument credits clinicians with a 'practical wisdom' that yields "error absorption in robust, flexible and resilient healthcare systems" (Zinck Pedersen, 2018: 112).

For its part, the study reported here avoided pre-judging human activity as either deficient or resilient. Instead it sought to explore the multi-layered and complex reality of clinicians' conduct by videoing the unfolding of practice in real time, and by involving clinicians in making sense of and proposing new futures for that conduct. We did so on the principle that practice improvement and behaviour change are contingent on practitioners themselves intervening in their "background [of assumptions and habits] of which [they] are not properly conscious but which guides and structures [their] conscious thought and action" (Shusterman, 2012: 47).

Our study thereby recognised practice as encompassing more than automatic, conditioned and ineffective reflexes on the one hand (motivating human factors scholars to emphasise clinicians' limitations), and practical wisdom on the other hand (motivating others to applaud clinicians' resilience). Shusterman's conception warrants being repeated here given the significance of its implications: "between the poles of blind, physical mechanism, and conscious, deliberative reason there exists in human behaviour a wide realm of habit that is automatic and unreflective but nonetheless purposively intelligent and often skilled" (Shusterman, 2012: 162). The unique effect of the reflexive process was that participants were now enabled to question, adjudicate and amend their own habits' appropriateness and intelligence.

Questioning our habits was a concern over a century ago for Dewey who championed "intelligent habits" (Dewey 1922: 55). The need for 'intelligent habits' becomes apparent when we recognise that "in today's increasingly complex and quickly changing world, environments are altered … at rates far too rapid for effective unreflective readjustment of habit" (Shusterman, 2008: 211). That is, reflexive attention to those aspects of conduct and context that escape awareness is critical for engendering effective adjustments and timely alignments of habits and practice. Given the dynamic complexity of contemporary care processes, this reshaping of habit can no longer be left to chance, and must become part and parcel of how we tackle healthcare safety and improvement.

This returns our argument to the point above about health service research and practice improvement are now paying increased attention to *in situ* practice, and are increasingly involving frontline practitioners themselves as the prime agents for research and improvement. While this move from care incidents and human deficiencies to the achievements of care is a significant one, it appears that it is nevertheless motivated by yet another unfortunate simplification: the "human as hero" (Reason 2018: 262). Our participants' discussions confirmed that practice was more complex than either of these stances acknowledge. Practice came to seen as entangled with contextual constraints, uncertainties and tensions, unacknowledged problems and risks, and conflicting habituations.

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This study homed in on these complexities, not just to analyse them but to explore with participants feasible and relevant ways forward. That is, the study sought in the first instance to identify opportunities for and with clinicians to tackle these complexities and derive more effective ways of working. In effect, the study engaged participants in a unique kind of *learning*. This learning was evident not in that the clinicians now adopted rules, or decided to align their practice more closely with those rules. Rather, their learning manifested in their showing increased receptiveness towards the complexities inherent in their activities and how they relate to the relevant rules.

Indeed, participants' learning was "not an act of mastery or control … but can perhaps better be described as a process of listening to the world, of having a concern for the world, of caring for the world" (Biesta, 2015: 238/9). The reflexive process thus invited practitioners to pay attention to and engage with previously unacknowledged aspects of practice. Far from leading to knowledge (rule) appropriation, this process elicited a broadened appreciation of the pervasiveness and complexity of rules as they permeated different levels of conduct and context. With this, rules were construed not principally as general principles and formal directives, but as a dynamic mangle of protocols, habits, assumptions, interpretations and practices, requiring clinicians' shared attention and deliberation.

This now raises questions about whether we can feasibly oppose 'work as imagined' to 'work as done'. This opposition appears to erase from view all the complexities just highlighted. Reanimating an antique 'mind-body' dichotomy, it draws attention away from that fraught and complex domain of human habit where rules, assumptions, interpretations, routines, adaptive practice and material constraints intertwine. We would suggest that the 21st century confronts healthcare professionals with developments, risks, complexities and uncertainties that call for more progressive theories and approaches. These theories and approaches must be progressive not just because they need to grapple with practice as a complex mangle of rule manifestations. They must be so too because they need to prioritise – methodologically and pragmatically – practitioners' learning. Since complexity demands that final answers, static solutions and distant directions are rendered relevant to local

contexts and situations by practitioners (Weick 1984), their intelligent engagement with habits and rules now is pivotal to how we tackle health care's complexity going into the future.

That said, the study's limitations were that its cohort of participating clinicians was limited, and that its impact was difficult to ascertain given the diffuse effects of this kind of enquiry and of the reflexivity it sought to engender. Moreover, the approach was challenging at times, requiring iterative participant information and consent processes for both the videoing and sharing of footage. In contrast to conventional studies wielding discursive and statistical tools that *de*personalise and *de*contextualise care data however, the present study relied on processes of engaging clinicians in creating and reviewing video footage that personalised, localised and contextualised 'what is'. Leapfrogging questions about how to recoup clinicians' responsibility for the quality and safety of *in situ* care (Wachter, 2012), this study thereby reconnected actors to familiar, taken-as-given and commonly ignored situations, contexts, principles, understandings and actions. This process also served to reconfirm clinicians' agency, enabling them to take charge of infection control as part of their complex, dynamic, and multi-dimensional field of practice.

Conclusion

This article has reported on a study whose point of departure was clinicians' enactments of infection prevention and control. The findings drew attention to the different dimensions of rules that need to be taken into account when exploring the rules in practice. Thus, clinicians came to recognise and articulate the differences among rules as explicitly articulated and expert-based principles; rules as dynamically evolving and contextually responsive reasoning, knowledge, and conduct, and rules as taken-for-granted habituations and embodied behaviours nurtured and drifting over time.

The study's methodology centred not on measuring conducts against taken-as-given standards, nor on asking clinicians focused questions, but on engaging clinicians with footage portraying their own real-time activities such that they were enabled to ask questions of themselves, of each other, and of their regulatory, practical and material contexts. This process demonstrated that 'to follow a rule (appropriately)' required

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clinicians to account for the full array of regulatory, material, pragmatic, interpretive and habituated dimensions of practice. These multiple dimensions of practice only became tangible and discussable for clinicians through witnessing real-time footage portraying their own infection control practices. The footage and the discussions it evoked helped them articulate how they were dealing with multiple rule versions, rule interpretations, rule obstructions and rule realisations.

Important here was that through creating connections among *in situ* activity, socio-material circumstances, personal understandings, team responsibilities, and workplace learning, the present study created a means for *clinicians themselves* to develop ways forward for their *in situ* care processes. As the findings above revealed, this produced specific and generic effects. Specifically, clinicians were enabled to ask questions about their own and others' infection control practices. Generically, they were enabled to confront the non-self-evident nature and status of rules. Put together, the study empirically confirmed the central role of frontline staff in asking what patient safety means in their own practice and context, coupling improvement to *in situ* practice and learning.

In conclusion, 'following a rule' cannot be the most critical aim of safety, improvement, or, for that matter, infection control. If "the central goal of safety is to avoid potential harm rather than compliance with [rules]" (Maxwell, 2013: iii), then it is critical for clinicians to ask what it means to navigate between rule compliance and rule avoidance. This returns us to Wittgenstein's question with which this paper began: "What does 'the rule according to which we proceed' really mean?" Is that rule one that steers our unreflective habits? Is it a general principle whose enunciations are in conflict, whose interpretations we disagree about, whose realisations diverge among practitioners, and whose instantiations are obstructed by material circumstances? Or is that rule an appeal to learning and enhanced intelligence? Asking these questions is no longer a philosophical nicety. On the contrary, asking these questions is now defining of clinicians' ability to accomplish health care quality, safety, and improvement in environments where complexity and uncertainty create more and more challenges for practitioners' agency, collaboration and professionalism.

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