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Checklist as Hub: How Medical Checklists Connect Professional Routines

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Introduction

In 1935, the aviation industry introduced the use of checklists to prevent human mistakes. That year the US Army Air Corps invited aeroplane manufacturers to build its next-generation long-range bomber. In theory, this 'competition' between two rivals, Boeing and Martin & Douglas, was expected to be a mere formality. Boeing was far ahead and its design had conquered any other design; the result of the competition seemed a foregone conclusion. However, during the test flight with a very experienced pilot, the innovative Boeing aircraft crashed and exploded. Two out of five crew members died. An investigation revealed that the crash had been due to pilot error. The innovative design required the pilot to perform several complex tasks, more than ever before. All in all, the new Boeing was deemed 'too much airplane

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for one man to fly'. Martin & Douglas won the competition with their smaller, less advanced aircraft, and Boeing nearly went bankrupt.

However, the US Army Air Corps still decided to purchase a few Boeing planes, and they came up with a very simple design to deal with their complexity: they designed a pilot's checklist that included step-by-step checks before take-off and landing. With the checklist, pilots managed to perform 1.8 million flights without any accident. The Boeing turned out to be the craft that gained the US the greatest advantages in the air during the Second World War. The rest is history, and the checklist became routine practice within the aviation industry (based on Gawande 2010).

The successes with checklists in the pioneering aviation industry made other sectors adopt the concept of checklists too. In many cases, this was done successfully. For example, the chemical and engineering industries integrated checklists into their daily work processes (e.g. Braham et al. 2014; Thomassen et al. 2011). However, the medical field remarkably lagged behind in this development. Despite many serious and thorough attempts—for example, resulting in a checklist that lists crucial safety checks before surgery—the medical profession still reports compliance rates that do not exceed 'average'[1] (e.g. Rydenfält et al. 2013; Van Klei et al. 2012). Newspapers report that 'not all surgeons follow checklists that prevent bad mistakes', even though the simplicity of the checklist is often emphasized. What results is that medical doctors feel assaulted by reprimands like 'they just don't do it!' Explanations for unsatisfactory compliance rates in this domain often emphasize the characteristics of the medical professional culture, with professionals who are not very susceptible to change, and strongly rely on their institutionalized autonomy (e.g. Freidson 1994; Tunis et al. 1994). A lack

[1]Although it must be said that compliance rates in studies that use self-registration data are a lot higher, sometimes even up to 99 or 100% (see e.g. Urbach et al. 2014; Fourcade et al. 2011). However, observational studies report compliance rates that hover around 30 per cent (complete checklist compliance) to 55% (partial checklist compliance) (e.g. Rydenfält et al. 2013; Van Klei et al. 2012). In later paragraphs we will further reflect on consequences of these different study designs.

of motivation is often considered one of the most important barriers to implementation (e.g. Cabana et al. 1999).

Although some of these claims indeed partly explain the poor use of checklists—the image of the medical profession as 'stubborn' and not open to change did not come out of nowhere—in this chapter it is claimed that there is more to this picture as one broadens its scope. I will do this by looking at professional routines. This chapter specifically focuses on how an envisioned routine—a safety checklist—*interacts* with existing routines by presenting the critical case of the Surgical Safety Checklist (SSC). There are two main reasons why this perspective is relevant for studying a checklist in this medical domain. First of all, surgical care delivery can be viewed as a complex web of multiple interdependent professional routines. Next, and adding to this, the SSC was explicitly designed to *connect* a number of these routines. Thus, in order to understand why a checklist becomes routine practice or not, we explicitly need to consider its relation with other routines. The research question central to this chapter is: *'How does a checklist interact with existing routines and how does this affect the creation of a connective routine?'*

Professional Routines

The study of organizational routines has boomed the past few years, especially since Feldman and Pentland (2003) first associated routines with organizational change. In classical work on organizational routines scholars predominantly associated them with organizational stability (e.g. Cyert and March 1963; Nelson and Winter 1982), and therefore, also with inertia and even mindless behaviour. Feldman and Pentland (2003) challenged this traditional view by conceptualizing internal routine dynamics and discerning two key routines dimensions: ostensive and performative.

The ostensive dimension is the abstract, generalized idea of the routine, used to refer to a certain activity or justify what people do. It relates to structure. The *performative* dimension consists of 'actual performances by specific people, at specific times, in specific places'.

It relates to agency. In other words, the ostensive dimension is the idea, the performative dimension is the enactment (Feldman and Pentland 2003). Third, the authors distinguish artefacts as factors that enable or constrain elements of routines. These artefacts take on visible and tangible forms, like protocols and checklists. Feldman and Pentland recognized a recursive cycle of performative and ostensive aspects, also affected by artefacts. The dynamic of the two produces both stability and change.

Since the recognition of internal routines dynamics, scholars have attempted to unravel internal routine dynamics to analyse how routines evolve over time. Though the basic idea that routines occur in 'bundles' has been recognized for many years (e.g. Nelson and Winter 1982). This idea indicates the need to consider the *multiplicity* of routines. However, 'we have studied stability and change in individual routines, but there has been less focus on how routines *affect one another* and how they work together to support stability and change' (Feldman et al. 2016, p. 509, emphasis added).

Moreover, very little is known about the interaction of routines in high-complexity *professional* domains. In this chapter I aim to fill this gap, by explicitly studying how a checklist—thus an envisioned connective routine—interacts with existing routines and how this affects the emergence of such a connective routine. Most studies conducted on checklist use in medical domains analysed the specific routine of a checklist in isolation from its context among other routines. For example, studies only report numbers on the self-registration of checklist use, and the few observational studies that have been conducted merely observed the performance of the specific checklist without taking other routines into consideration (e.g. Rydenfält et al. 2013; Pickering et al. 2013; Levy et al. 2012). In this way, we only get to see if a specific checklist has been used, but not how other routines affected its performance.

In this chapter, the framework of Feldman and Pentland is extended as presented in Fig. 8.1. The assumption is that the routine that emerges in the middle—the envisioned connective routine—is formed by

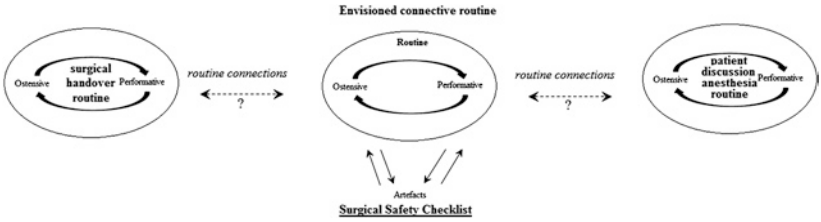

Fig. 8.1 Surgical safety checklist as 'hub' connecting multiple professional routines

its interaction with other routines. A focus on the *interaction* of routines is especially relevant for the study of routines in complex professional healthcare settings, since care delivery consists of a multiplicity of interdependent professional routines (e.g. patient handovers, anaesthetic routines) that need to come together in the multidisciplinary team checklist routine. Put differently, surgical care is not only about coordinating a series of related routines within a sub-discipline, it is also about ongoing coordination with professional routines that shape the work in other sub-disciplines such as anaesthesia. During the surgical routine, the surgeon draws on professional knowledge to continuously assess what has been done and what still needs to be performed, which involves ongoing coordination with other routines such as those in anaesthesia. The performance of such professional routines is thus highly interdependent and entails coordinating a series of connections with related routines (Hilligoss and Cohen 2011).

However, the creation of such connective routines might be difficult, for at least two reasons. First, the artefact explicitly prescribes behaviour, while established professional routines are mostly implicit—encompassing tacit knowledge. Although these routines structure work, they are not backed up by codified artefacts. Second, professional routines are mostly segmented. Socialization into sub-disciplines makes professionals construct a sense of *their* profession which includes its duties, boundaries, values, aspirations and relation to others (Abbott 1988; Freidson 1994; Cruess et al. 2015). Different routines, therefore, guide behaviour in the various sub-disciplines.

Medical Checklists

A checklist is most commonly claimed to be a 'memory aid', and consequently, a 'simple intervention'. As reflected by one of the introductory newspaper headings, a surgical safety checklist is sometimes even seen as an individual tool, for a surgeon who has to comply with a rule. Although in the scholarly literature checklists are indeed seen as tools for surgical teams, scholars in the field of implementation science often approach checklists as a technical intervention, not acknowledging the context in which they have to be applied. For example, in their review in the British Medical Journal Quality and Safety, Treadwell et al. (2013: 1) conclude that 'surgical checklists represent a relatively simple and promising strategy'. The way in which (safety) checklist are approached in these studies echoes a rather strong form of technical determinism (Pentland and Feldman 2008) 'Designing' new routines would be a simple matter of creating the checklist, and once in place, these written checklists will determine patterns of action: they will get checked. This relates to the claim made by Atul Gawande (2010), who stated: 'The checklist works—as long as it is implemented well.'

However, checklists are far from simple procedural tools. They are *social* interventions that interfere with both the practical and social taken for granted ways of working (see also Bosk et al. 2009). From a more sociological perspective, scholars have investigated why professionals tend to *resist* checklist that prescribe action patterns (e.g. Evetts 2002; Bosk et al. 2009). However, studies have shown that professionals not only work against reforms but also *with* reforms (e.g. Wallenburg et al. 2016). There is a call for more nuance than organizational control or professional resistance (ibid.; Waring and Bishop 2013) In this chapter I aim to provide such a nuanced perspective by tracing at a micro level how routines are created or changed through everyday mundane practices.

The case central to this chapter, the SSC, was explicitly designed to create connections between different professional routines, or as one of the respondents stated: 'everything has to come together'. The SSC

consists of three parts: a morning *briefing* at 8 a.m. in which all patients are discussed by the whole surgical team; and two patient-related moments: a *time out* right before incision; and a *sign out* just before the patient leaves the operating theatre.[2] For example, in the time out the complete surgical team has to perform the latest safety check, in which they rely on each other's information. The professional routines of the sub-disciplines thus have to connect in this checklist routine. I will empirically explore how the various professional routines connect (or not) in the checklist routine, and therefore take into consideration other firmly established routines.

Empirical Research

The research aim was to get a contextualized understanding of checklists in professional domains by studying how various professional routines interact. Therefore, I adopted a focused ethnographic (FE) approach (see e.g. Higgingbottom et al. 2013). 'Focused' in this approach refers to a problem orientation; within FE the topics of enquiry are pre-selected. Although the focus of this study was clearly demarcated in advance—the Surgical Safety Checklist—this qualitative method, using an inductive paradigm to gain in-depth understanding, differs from deductive (observational) studies that might fail to capture a holistic perspective. This FE approach allowed for studying how a checklist is embedded within daily work routines.

The author was appointed as a 'research assistant' in the hospital under study, and with this employment formal access to the field was arranged. Focused ethnography is characterized by episodic observation. Because of its problem orientation, the purpose is not to 'go native' but

[2]The World Health Organization introduced the first version of this Surgical Safety Checklist, and explicitly encouraged hospitals to adapt this general format to their local circumstances. Therefore, the hospital under study transformed the 'sign in' check to a morning 'briefing' in which all patients of the day are discussed. More information on the Surgical Safety Checklist can be found on the WHO website.

to get an in-depth understanding of the selected study topic. In the course of 8 months, approximately five full working weeks were spent in the surgery department for observation. These observations were preceded by informal interviews about the research topic with all the respondents who consented to observations.

Since the aim was to find out how the SSC connects to other routines, I did not merely observe the performance of the checklist in the operating theatre, as most research so far has done. In addition, I observed the full working days of different professionals who were involved in the checklist routine to get to know the various routines they were engaged in, as well as the interaction of these routines. I used a shadowing technique to do this (McDonald 2005). I shadowed both specialist surgeons and anaesthesiologists to learn about routines from different professional perspectives.

During observation, detailed field notes were taken. Data collection was extended by recording summaries of many informal conversations and obtaining various related artefacts such as policy documents, checklists, emails and information from the software system. Data analysis consisted of thematic analysis of the detailed written field notes and conversation reports using NVivo software.

The ethnographic field notes taken during observation were jotted down in a notebook and meticulously written up in digital format after every episode of data collection. Both observation and conversation data were imported into NVivo10 software for the purpose of thematic content analysis. The analysis was based on an initial coding scheme developed from the conceptual model (Fig. 8.1), incorporating emergent themes as they were identified throughout the research process. During the coding process, themes were identified to describe both the actions and abstract ideas of the various team members and the circumstances under which connections emerged. They were used to explore the processes of connective routines as social, situated and ongoing activities.

Checklists in Action

Varying Checklist Performances

During episodic observations at the surgery department, I got to see many performances of the Surgical Safety Checklist.[3] A first finding was that from all these attended checklist performances, not one repetition of the checklist routine was the same. The routine performances strongly varied, for example, in the number of people that attended, how fluently the routine fit within the process, how extensively the checklist was discussed, the extent to which participants paid attention, and who led the conversation. In other words, the connections as envisioned by the checklist were not always self-evidently established.

By shadowing different clinicians from different specialisms, I got to know the various routines they engaged in. As I learned about the interaction of routines, clues about the varying checklist-routine performances became evident. Based on the observation data, I first schematized an ideal typical situation in which the checklist does generate connections between different routines (Fig. 8.2). Although this visualization is a significant simplification of reality, it does provide insight into both the various practices that construct professional work and the envisioned connections.

The vertical flow of boxes represents the various activities individuals are engaged in. The horizontal lines in the figure represent the location in the processes where the different phases of the checklist (briefing, time out, sign out) have to be performed, and thus connections established.

There are a few important observations supplementing this visual. First, professional work is *layered* since it consists of: (1) individual work practices such as checking upon patients, (2) professional

[3]Depending on the perspective of observation—shadowing either a surgeon or an anaesthesiologist—the number of attended performances of the checklist in a day varied from five, in the case of a surgeon who had to perform two complex vascular surgeries (one briefing, two time outs and two sign outs), to 24, when shadowing an anesthesiologists who had to take care of anaesthesia for seven operations in OR1 and four in OR2 (two briefings, eleven time outs, eleven sign outs).

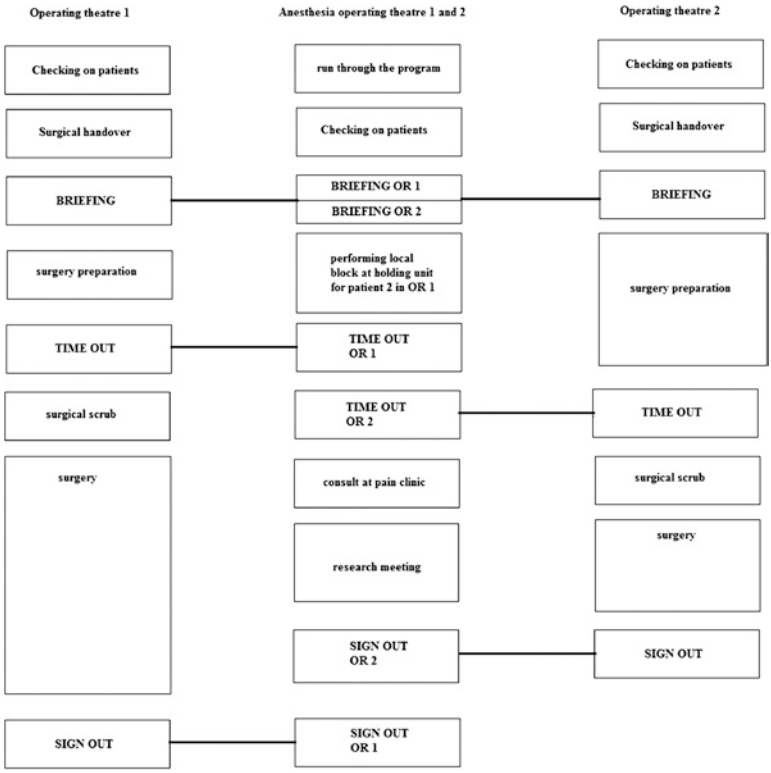

Fig. 8.2 Envisioned routine connections

routines within sub-disciplines, such as handovers; and (3) multidisciplinary routines that connect the various routines, such as the time out in the SCC. Second, the *organization* of work processes differs among the professional disciplines: the organization of surgical care is linear, whereas the organization of anaesthesia is entwined. Anaesthesiologists have to manage at least two linear surgical processes in different ORs simultaneously.

This figure merely represents one series of routines—one surgery in each operating theatre—while the number of operations per theatre can add up to seven or eight a day. Also, the blocks that represent time slots are clearly demarcated, but in reality the length of these blocks is highly

unpredictable. The scheduled time for a surgery might be one hour, but because of unexpected events, for example concerning the patient's condition, this timing might fluctuate. Finally, this visual does not provide any information about the ostensive dimension of the various routines, and thus the values and norms encompassing these routines. It, therefore, neglects value judgements and thus pressures for prioritization.

All in all, the lines that represent the connections in the ideal type are not that straightforward. In reality, the envisioned connections lead to incompatible demands for professionals, for example, because the time blocks might overlap and thereby disturb the emergence of connections.

Responding to Incompatible Demands: Work on It, Work Around It, Work Without It

As observations proceeded, I faced numerous situations in which the envisioned routine connections led to incompatible demands for participants. I further explored how professionals responded to these incompatible demands. From the data I derived three responses that routine participants developed to deal with these conflicting demands: *work on it*, *work around it* and *work without it.*

Work on It

The first response was labelled 'work on it'. This tag emphasizes that actors are 'busy doing things'. In the best way they can, they try to unite incompatible demands. The following vignette illustrates how one of the anaesthesiologists was confronted with conflicting demands. Because several delays occurred in the process, anaesthesia was demanded at two operating theatres at the same time.

> We are halfway through the programme in the operating theatre[4] where four gynaecology operations are planned today. To resume the

[4]Field notes taken when shadowing a surgeon.

programme, the surgeon needs the anaesthesiologist for epidural anaesthesia and the time out. The assistant calls the anaesthesiologist to ask if he will come to the theatre for the time out. The anaesthesiologist answers that he is still very busy at the other theatre, where his task is complicated and will take a few more minutes. If they can wait a little longer, he will be there as soon as he can.

A few minutes pass by, in which the surgeon checks the clock several times. She sighs. 'Come on, hurry up! I have more to do today! And you know what, if the programme isn't finished in time, who has to inform the last patient that the surgery is postponed?! Me!' To the anaesthesia nurse: 'Can't you call one of the other anaesthesiologists? There might be someone wandering around, right?'

The anaesthesia nurse calls the staff room to see if someone is available. She hangs up the phone, and, satisfied, she says, 'There will be someone any minute!'

Again, a few minutes pass by. Then the second anaesthesiologist who was called enters the theatre and prepares for the epidural. Within seconds, the other anaesthesiologist enters the room. 'What are you doing here?' And then, annoyed, 'You should have called me if you didn't need me anymore. Now I have been working my ass off and rescheduled to be here, and for what? For nothing!'

The anaesthesiologist is not able to perform epidural anaesthesia in the two theatres at the same time. However, in the best way he can, he tries to manage these two processes anyway. This response involves informing the others to manage their expectations and prioritizing the different tasks. By giving priority to finishing the first task, the processes in the other operating theatre are put 'on hold'.

For the surgeon, this means that her series of routines gets disturbed. To keep the process going she tries to find a replacement for the anaesthesiologist, which again requires a lot of adjustment. In the end, the various professional routines seem to 'clash' rather than 'connect'. A conversation with the surgeon, later on, revealed some ideas about the ostensive dimension of the checklist routine. She argued that they were

already used to performing safety checks before surgery, but with the formal checklist that requires all team members to be present, the process became more complicated and was often disturbed. In other words: 'It distracts me from what I'm doing'. So from a surgery perspective, the abstract idea of the checklist routine becomes a distraction, rather than a valuable tool. This ostensive idea did not come about in isolation, however; it was fuelled by the interrelation with other routines where a misfit occurred.

Because the different routines do not connect, the checklist not only seems to fall far short of expectations, but also seems to reinforce routines within the sub-disciplines—including senses of 'us' and 'them'—which makes the establishment of connections all the more difficult.

Work Around It

The second response reflects strategies used by professionals to get to the best result by adjustment; they work around (Morath and Turnbull 2005) the formal procedures. So rather than doing the best they can to make it work anyway, professionals fashion a solution to an unexpected problem or situation. This response has been identified in medical settings in earlier research (see e.g. Koppel et al. 2008).

Work arounds occurred in different ways. For example, they might involve completing and registering tasks at different moments than prescribed—surgeons who register the completion of the time out checklist before actually performing the checklist so they can move on more smoothly, or who perform the sign out checklist that entails recording post-operative agreements when these agreements are still to be made. Work arounds might also involve outsourcing operational tasks to someone else. The following vignette illustrates how an anaesthesiologists outsourced his tasks to a nurse anaesthesiologist who was lower in the hierarchy to deal with incompatible demands.

> The anaesthesiologist has been called because the patient is ready for the time out checklist. I follow the anaesthesiologist to the operating theatre,

> but when we get there the surgeon is not present. The anaesthesiologist starts wandering around the surgery department to see if he can find the surgeon anywhere – without success. 'Okay then, I am going to do something else as well,' he says, apparently mostly to himself. To the operating assistant he says: 'Please call me when he returns.' We head back to the staff room. About ten minutes later the nurse assistant calls to inform us that the surgeon has returned and we can come for the time out.
>
> At that time, however, we are already busy signing out in the other operating theatre. The anaesthesiologist asks the nurse anaesthetist to take over his tasks and says, 'You know the patient better than I do.'

In this situation, again an anaesthesiologist faced different care demands at the same time: a time out in one theatre and a sign out in the other. In order to not further delay the process, the anaesthesiologist decided to complete the task he was working on, and asked the nurse assistant in the other theatre to take over his tasks there.

During a coffee break later on, I asked the anaesthesiologist about this 'outsourcing'. He acknowledged that formally he was responsible and not allowed to delegate this work to someone lower in the hierarchy. However, trying to unite incompatible demands seemed unrealistic and thus unsafe, while this delegation seemed a reasonable option. The nurse anaesthesiologists are skilled, and they monitor the patient in the operating theatre the whole time, and therefore they do sometimes know the patient better than the anaesthesiologists. Moreover, they can always call for assistance. When I asked the anaesthesiologist if he felt uncomfortable with this situation he replied, 'That's why I made the call afterwards, just to be sure'.

This response comes out of the interrelation of routines in the first place, but is fuelled by the abstract idea of a routine that differs from the artefact. Although the artefact prescribes that anaesthesiologists have to fulfil these tasks themselves, they might feel that this is not necessary in order to deliver safe care. When routines are conflicting, they work around the formal procedure since they consider it safe.

Work Without It

The third response was labelled 'work without it'. With this response professionals did not strive to unite incompatible demands, but they explicitly made a choice. They prioritized one task over the other. This might mean working without the checklist, using it partly, or involving only a few team members. However, it might also mean working with the checklist and thereby casting aside another task, as the following vignette illustrates.

> It is 7.50am on the day that I shadow one of the trauma surgeons. The day started at 7am with a round over the wards visiting the patients who are planned for surgery today or need extra care. We have to hurry to make it to the patient handover in the trauma surgery department where the status of the patients is discussed with all the trauma surgeons. The handover has already begun, and several clinicians are still walking in and out.
>
> We have been at the handover for only five minutes when the trauma surgeon nods at me to leave. We have to go to the surgery department for the morning briefing. In the corridor I bump into the head of department; he argues that the idea of a briefing routine is highly valuable, but other routines have been overlooked. The morning handover has been a firmly established routine in the trauma surgery department, and the head of department underlines the value of discussing all the patients within the sub-discipline.
>
> The introduction of the briefing, however, interfered with this routine since it requires surgeons to be at the operating theatre at 8am for the briefing. In order to manage this, they skip the handover. 'So they are going to a briefing to discuss the patients, but they haven't even properly discussed these patients within their own department,' he concludes.

The handover, a longstanding routine within the trauma surgery department, had been put into second place by the multidisciplinary briefing.

Professionals cannot fulfil these two tasks, and they prioritize the new routine. This made me wonder why they choose the new routine over the longstanding tradition.

Apparently, from a clinicians' perspective the ostensive dimension of the routine was that this briefing was 'important'. The briefing had been made into a formal routine and was reflected in several artefacts. In addition, surgeons argued that they were judged on their performance of the briefing—or rather, on the registration of the briefing. The patient handover in the trauma surgery department, although firmly institutionalized, was an informal routine. It was a longstanding tradition but was not backed by artefacts per se, and clinicians were not directly judged on it.

One routine; briefing, had been made more prominent, backgrounding the other, the handover. The new briefing routine thus partly replaced the existing handover routine. Performance measurement seems important for prioritizing routines.

Conclusion

This chapter has shown that a checklist in medical care does not stand on its own. Any routine is 'enmeshed in far-reaching, complex, tangled webs of interdependence' (Feldman and Pentland 2003, p. 104). I found the interdependence with conflicting routines to be an explanation for variability in routine performance. The routine connections as intended by the checklist are often not that straightforward and may even lead to incompatible demands for professionals. Rather than standardized responses, these incompatible demands require *responsiveness*. I derived three responses that professionals have developed to deal with incompatible demands: *work on it*, *work around it* and *work without it*. These responses often entail 'on the spot' decisions; there are no formal routines for prioritization.

The ethnographic data show how routine dynamics can be altered through the interaction of routines. For example, because of a conflict between existing routines and the checklist as an envisioned routine, ostensive aspects of the routine might change from a 'helpful tool' into 'a distraction' and thereby affect performance. How professionals value

the checklist routine is thus not so much about the checklist itself, but about its (mis)fit with existing routines.

Furthermore, different groups (anaesthesiologists, surgeons) might have different understandings of a routine's ostensive aspect, e.g. what is important, what is the priority (cf. Zbaracki and Bergen 2010). When the checklist does generate a clash rather than a connection, this might also reinforce the strength of already existing routines within sub-disciplines and even result in conflict.

This analysis of the interrelation of routines highlights the importance of a different perspective on checklists in medical care. Thus far, checklists have predominantly been approached as instrumental coordination mechanisms, especially in implementation science. Routine theory underlines the importance of the interrelation with other routines, and provides a more contextual understanding. I conclude this chapter by claiming that checklists are actually 'hubs'. Checklists are about making connections between multiple professional routines. All these different routines, with their own structures, norms and values, have to connect in this hub. To get back to the Boeing that was considered 'too much airplane for one man to fly', I conclude this chapter by stating that in this case, it is not solely about too *many* processes for one checklist to capture, but about too many *different routines*. Because professional routines often fail to connect in a checklist, varying ostensive dimensions emerge—checklists therefore might lead to conflicts rather than connections. In order to make checklists routine practice in medical domains, attention should be paid to this interrelation with existing routines.

References

Abbott, A. (1988). *The system of profession: An essay on the division of expert labour*. Chicago: Chicago University Press.

Bosk, C. L., Dixon-Woods, M., Goeschel, C. A., & Pronovost, P. J. (2009). Reality check for checklists. *The Lancet, 374*(9688), 444–445.

Braham, D. L., Richardson, A. L., & Malik, I. S. (2014). Application of the WHO surgical safety checklist outside the operating theatre: Medicine can learn from surgery. *Clinical Medicine, 14*(5), 468–474.

Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A. C., & Rubin, H. R. (1999). Why don't physicians follow clinical practice guidelines?: A framework for improvement. *JAMA, 282*(15), 1458–1465.

Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2015). A schematic representation of the professional identity formation and socialization of medical students and residents: A guide for medical educators. *Academic Medicine, 90*(6), 718–725.

Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.

Evetts, J. (2002). New directions in state and international professional occupations: Discretionary decision-making and acquired regulation. *Work, Employment & Society, 16*(2), 341–353.

Feldman, M. S., & Pentland, B. T. (2003). Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly, 48,* 94–118.

Feldman, M. S., Pentland, B. T., D'Adderio, L., & Lazaric, N. (2016). Beyond routines as things: Introduction to the special issue on routine dynamics. *Organization Science, 27*(3), 505–513.

Fourcade, A., Blache, J. L., Grenier, C., Bourgain, J. L., & Minvielle, E. (2011). Barriers to staff adoption of a surgical safety checklist. *BMJ Quality & Safety, 21*(3), 191–197.

Freidson, E. (1994). *Professionalism reborn: Theory, prophecy, and policy*. Chicago: University of Chicago Press.

Gawande, A. (2010). *The checklist manifesto: How to get things right*. London: Picador.

Higginbottom, G., Pillay, J. J., & Boadu, N. Y. (2013). Guidance on performing focused ethnographies with an emphasis on healthcare research. *The Qualitative Report, 18*(9), 1–6.

Hilligoss, B., & Cohen, M. D. (2011). Hospital handoffs as multifunctional situated routines: Implications for researchers and administrators. *Advanced Health Care Management, 11,* 91–132.

Koppel, R., Wetterneck, T., Telles, J. L., & Karsh, B. T. (2008). Workarounds to barcode medication administration systems: Their occurrences, causes, and threats to patient safety. *Journal of the American Medical Informatics Association, 15*(4), 408–423.

Levy, S. M., Senter, C. E., Hawkins, R. B., Zhao, J. Y., Doody, K., Kao, L. S., & Tsao, K. (2012). Implementing a surgical checklist: More than checking a box. *Surgery, 152*(3), 331–336.

McDonald, S. (2005). Studying actions in context: A qualitative shadowing method for organizational research. *Qualitative Research, 5*(4), 455–473.

Morath, J. M., & Turnbull, J. E. (2005). *To do no harm: Ensuring patient safety in health care organizations*. San Francisco: Jossey Bass.

Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press.

Pentland, B. T., & Feldman, M. S. (2008). Designing routines: On the folly of designing artifacts, while hoping for patterns of action. *Information and Organization, 18*(4), 235–250.

Pickering, S. P., Robertson, E. R., Griffin, D., Hadi, M., Morgan, L. J., Catchpole, K. C., & McCulloch, P. (2013). Compliance and use of the World Health Organization checklist in UK operating theatres. *British Journal of Surgery, 100*(12), 1664–1670.

Rydenfält, C., Johansson, G., Odenrick, P., Åkerman, K., & Larsson, P. A. (2013). Compliance with the WHO surgical safety checklist: Deviations and possible improvements. *International Journal for Quality in Health Care, 25*(2), 182–187.

Thomassen, Ø., Espeland, A., Søfteland, E., Lossius, H. M., Heltne, J. K., & Brattebø, G. (2011). Implementation of checklists in health care; learning from high-reliability organisations. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 19*(1), 1.

Treadwell, J. R., Lucas, S., & Tsou, A. Y. (2013). Surgical checklists: A systematic review of impacts and implementation. *BMJ Quality & Safety, 23,* 299–318.

Tunis, S. R., Hayward, R. S., Wilson, M. C., Rubin, H. R., Bass, E. B., Johnston, M., & Steinberg, E. P. (1994). Internists' attitudes about clinical practice guidelines. *Annals of Internal Medicine, 120*(11), 956–963.

Urbach, D. R., Govindarajan, A., Saskin, R., Wilton, A. S., & Baxter, N. N. (2014). Introduction of surgical safety checklists in Ontario, Canada. *New England Journal of Medicine, 370*(11), 1029–1038.

Van Klei, W. A., Hoff, R. G., Van Aarnhem, E. E. H. L., Simmermacher, R. K. J., Regli, L. P. E., Kappen, T. H., & Peelen, L. M. (2012). Effects of the introduction of the WHO "Surgical Safety Checklist" on in-hospital mortality: A cohort study. *Annals of Surgery, 255*(1), 44–49.

Wallenburg, I., Hopmans, C. J., Buljac-Samardzic, M., den Hoed, P. T., & IJzermans, J. N. (2016). Repairing reforms and transforming professional practices: A mixed-methods analysis of surgical training reform. *Journal of Professions & Organization, 3*(1), 86–102.

Waring, J., & Bishop, S. (2013). McDonaldization or commercial re-stratification: Corporatization and the multimodal organisation of English doctors. *Social Science and Medicine, 82,* 147–155.

Zbaracki, M. J., & Bergen, M. (2010). When truces collapse: A longitudinal study of price-adjustment routines. *Organization Science, 21*(5), 955–972.