

Exploring gaps in cancer care using a systems safety perspective

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Abstract Gaps in the continuity of care may appear as losses of information or momentum or as interruptions in the delivery of care. To systematically improve patient safety, we need to know more about how gaps in the continuity of health care are identified and mitigated. This study seeks to describe healthcare professionals' understanding of how they anticipate, detect and handle gaps in cancer care. Ten focus-group interviews and two individual interviews were conducted with a total of 34 cancer-care professionals (physicians, nurses, managers and administrators) from three counties in mid-Sweden. Various specialties in cancer care were covered: primary care, in-hospital care, palliative care, advanced home care, and children's care. Interviews were analyzed inductively using qualitative content analysis. The results show that patient safety in cancer care is dependent on a resilient organization that is capable of anticipation, monitoring, adapting and learning at all levels of care. The professionals anticipated gaps in situations where contacts between healthcare providers were limited and when they were faced by time or resource constraints. The extent to which gaps could be managed by professionals at the sharp end was largely determined by their ability to adapt to complex and unexpected situations in their daily work. The management of gaps was perceived differently by managers and clinicians, however. The study also indicates that the continuity of care could be improved by patients' participation in decisions about treatments and care plans, and by a mutual responsibility for the transfer of information and knowledge across professional boundaries. These results are

discussed from a resilience engineering perspective, and they emphasize the management's responsibility to address gaps identified in the system. Designing resilient healthcare organizations enables professionals at the sharp end to prevent human error or mitigate its consequences.

Keywords Cancer care · Continuity of care · Health care professionals · Patient safety · Resilience engineering

1 Introduction

Gaps in the continuity of care are a major problem in the patient-safety field (Cook et al. 2000). Continuity of care has been defined as a consistent, seamless provision of a cohesive patient care over time, involving different healthcare providers and settings (Haggerty et al. 2003; Uijen et al. 2012a). Gaps can be regarded as discontinuity of care and may appear as losses of information or momentum or as interruptions in the delivery of care (Cook et al. 2000). Gaps are most readily seen when they coincide with organizational and institutional boundaries which involve a transfer of responsibility and authority for patient care (Cook et al. 2000; Nemeth et al. 2008). Gaps imply a latent risk for adverse events or medical mishaps. For example, the interface between primary care and specialized care is recognized as being associated with a high risk of adverse events (Forster et al. 2004; Tandjung et al. 2011). Lapses like lacking response to abnormal test results and missed healthcare screening opportunities were identified when patients were transferred between different practitioners (Caines et al. 2011). There is a particularly high risk of error in medical treatment after discharge of a patient to a resident hospital or general practitioner (Caines et al. 2011; Oksholm et al. 2011; Uijen et al. 2012b). In a

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Canadian study, it was shown that 19 % of patients suffered adverse events after discharge from hospital, 70 % of which were either preventable or ameliorable (Forster et al. 2003). Lack of information and communication seems to be a major reason why gaps occur, and better information to patients has been proposed as a way of improving safety (Abraham et al. 2012; Tandjung et al. 2011). In some cases, patients request a copy of their own medical records to ensure that information is transferred across institutional boundaries (Wibe et al. 2010, 2011).

Gaps in the continuity of care have been identified even in the work of single practitioners (Uijen et al. 2012a, b). Such gaps could occur for example when a practitioner is interrupted while concentrating on a task, or when nurses have to divide their attention between several patients (Cook et al. 2000). Gaps may also arise as unintended side effects of organizational and technological change (Cook and Woods 1996). Advanced technological systems have been introduced to make care more efficient and safe, but they may also generate new risks. A trend in many countries is that advanced medical and technological care increasingly often is given in the patients' homes (Fex et al. 2011a), for example using devices for oxygen therapy, dialysis, blood transfusion or pain relief. Therefore, issues relating to the responsibility, authority, cooperation and communication between professionals involved in home care become more and more important. The same applies to the involvement of patients and family members in caregiving (Fex et al. 2011b).

Generally, healthcare professionals are sensitive to cues indicating that continuity of care has been lost, and they routinely work to restore it. In most instances, healthcare professionals are capable of handling complex situations and of detecting and bridging gaps to prevent adverse events. Research on patient safety has in recent years been based more and more on a systemic approach, with a view of increasing the degree of resilience in healthcare organizations. Resilience is the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances. A resilient system can sustain vital functions even after a major mishap or in the presence of continuous stress (Hollnagel et al. 2011; Nemeth et al. 2008). 'Brittleness' is the opposite of resilience (Woods et al. 2006). Resilience engineering (Hollnagel et al. 2011) can enable an organization to cope with and recover from unexpected situations. A resilience engineering perspective requires a systems approach, where one takes all parts of a system and their relationships into account, rather than one or more individual components. This approach is based on how people in an organization create safe care by anticipating possible adverse outcomes and acting in advance to avert them. This is what the U.S. Navy terms as 'being forehanded' (Weick 1995).

To systematically improve patient safety in complex healthcare systems, we need to know more about how gaps are identified and mitigated by professionals at the 'sharp end' of practice, i.e., at the point of contact between patients and the healthcare professionals. We also need to know more about how decisions made at the top of the organization (the 'blunt end' of the system) affect the professionals' ability to conduct safe care at the sharp end of the system. An example of a complex organization is cancer care, which is divided into many different specialties, clinics, and levels of care, with many stakeholders involved. It is often unclear where the responsibility for a cohesive cancer care lies. Furthermore, professionals in cancer care face major challenges in dealing with advanced technology and potent drugs. This makes cancer-care trajectories a particularly suitable subject for studies of gaps in the continuity of care. Most prior research on continuity of care has focused on aspects of communication and on patients' experiences. There is a paucity of studies on continuity of care across complex care organizations as seen from a systems perspective. This explorative study seeks to provide a deeper understanding of how professionals in cancer care prevent medical mishaps by anticipating, discovering and handling gaps that occur in their daily work.

2 Methods

2.1 Design and participants

This study collected data using focus-group discussions, as described by Krueger and Casey (2000). Focus-group interviews, as opposed to individual interviews, take advantage of group dynamics and may lead to discussions among members of the group. The open-ended nature of focus groups makes them useful when exploring attitudes, opinions and perceptions. A focus-group approach also entails a natural quality control of data collection, since participants can both refute and validate each other's views (Robinson 1999).

Participants were selected among cancer-care professionals (including managers as well as physicians, nurses and assistant nurses) who had been employed for at least one year at their current workplaces and were able to describe their experiences in rich detail. To recruit volunteer participants for the focus groups, an introductory letter was sent to the managers of cancer clinics in three counties in central Sweden. To provide a broad picture of the cancer-care trajectory, we contacted clinics responsible for various parts of this trajectory: primary health care, in-hospital care, treatment departments, palliative care, advanced home care, and children's hospitals. The

managers of the hospital departments were contacted by the first author and asked if they were willing to participate in an interview. Managers in their turn informed the staff about the study, and employees who were interested in taking part in the study were invited by the first author to participate in a focus-group interview. Prior to each interview, the participants were orally informed that participation was voluntary, that they could at any time withdraw from the study, and that their confidentiality was protected by coding of their identities. Twelve interviews were conducted with a total of 34 participants (5 men and 29 women) from different specialties in cancer care. Their experience of cancer care ranged from 1 to 30 years (with an average of 12 years). For practical reasons, two interviews were performed with single participants.

2.2 Interview procedure

Focus-group interviews were conducted in October and November 2011 by the first author, assisted by the second author. Both are experienced with focus-group interviewing. The interviews were performed in an undisturbed room at each workplace and lasted between 45 and 60 min. The interviews followed a thematic interview guide (Kvale and Brinkmann 2009) that was based on an MTO perspective (Man–Technology–Organization) (Rollenhagen 1997). This perspective is focused on how people’s physical, psychological and social conditions interact with different technologies and organizational forms. Each group session began with an opening question concerning how the participants interpreted the concept of patient safety. During the interviews, the respondents were asked to describe situations where they had anticipated or discovered gaps in the daily care and how they managed or failed to bridge the gaps. Further questions were posed in order to clarify, explore, deepen and validate the answers or to guide the respondents back to the topic (Kvale and Brinkmann 2009).

2.3 Analysis

The interviews were tape-recorded and transcribed verbatim. The transcripts were analyzed inductively using qualitative content analysis (Burnard 1991; Elo and Kyngas 2008) for identifying central themes. We studied the written material several times in order to become completely familiar with the data (Burnard 1991). Next, we organized the qualitative data by inserting notes and headings in the text intended to describe as many aspects of the content as possible. Following this open coding, we sorted the codes into preliminary categories by collating observations that were similar or related. During this phase, three descriptive categories emerged from the interviews, two of them divided into sub-categories. These categories defined the

professionals’ understanding of gaps in the continuity of cancer care (Burnard 1991; Elo and Kyngas 2008).

3 Findings

The three main categories that appeared in the interviews highlight that safety in cancer care is highly dependent on the personnel’s ability to *anticipate gaps and recognize cues of gaps* that needed to be acted upon. Gaps implied a risk of adverse events, and professionals at the sharp end of the system were constantly struggling to *manage gaps created by the system*. Although managers and all other professionals were aware that the system could produce failures, the risks were considered from *different perspectives at the blunt and sharp ends of the system*. The findings presented in the following text are illustrated with quotations from the interviews.

3.1 Anticipating gaps and being sensitive to cues of gaps in the system

The professionals anticipate gaps in situations when the interface between the patient and the healthcare system is limited, and when the professionals are constrained by a heavy workload or other difficulties. Their ability to detect the gaps is very much a question of being sensitive to cues of fragility in the system.

3.1.1 *The interface between the patient and the healthcare system*

Participants stated that they anticipate gaps in the continuity of cancer care when the interface between the patient and healthcare professionals is inadequate. This includes situations when the information transfer between key actors involved is scanty or when personal contacts are brief or lacking, for example during telephone consultations, at the patient’s first contact with general practitioners, or in transitions between different types of care. Gaps can also occur when there are rapid changes of staff, for example among ambulatory general practitioners, or when specialists have little time for clinical work because of research or administrative duties.

And some doctors who come into help out or permanent staff working very few hours is a problem. It can happen that...something distracting occurred and the referral was never sent. Sometimes it is sent—but maybe to the wrong place, or to the wrong address, and it’s lying there on someone else’s table...

When the interface between patients and the healthcare system is limited, professionals can find cues for acting by

being sensitive and responsive to the patients' worries and underlying messages. Some participants in the interviews described how they suddenly may remember a similar case or a colleague's advice: 'if you have a patient with these symptoms, you should ...' By posing further questions, and by following their 'gut instincts', they can act in a way that mitigates or prevents a mistake.

... Sometimes you get a feeling.... but it's harder over the phone. Then we don't have the clinical picture either. I think... you might have a feeling that it's out of the ordinary...maybe if they're very worried and you...try to ask the right questions ...

Creating more time for reflection, for example by calling the patient for a second checkup, is an effective preventative measure against misdiagnosis according to one general practitioner. At the second visit, the patient has had time to think and may more easily remember and describe obscure symptoms. Test results are available, and there are better opportunities for understanding and assessing the patient's condition.

3.1.2 *Dealing with time constraints*

Professionals at different levels in the organization stated that medical mishaps occur more frequently when they are understaffed and the workload is high. Stress and constant interruptions are common features of the work, and essential information is easily lost when the staff has to split its focus between several tasks. This produces a feeling of not being in control of the situation and therefore of being insufficiently able to detect and prevent mistakes. One nurse stated that she often felt like 'a ticking bomb'.

And I think you get interrupted more—you know that people are waiting in the waiting room. Or maybe I'll squeeze in answering phone calls and manning the clinic if there are too few of us. And then you have two tasks—like when you work in the ward and mix infusions with talking to the patient.... you never have time to sit down with what you're doing—and finish it...there's a risk it will turn out wrong. And you forget to tell someone at the clinic that this patient should get a time booked before treatment... There are so many steps that can go wrong ...

Another aspect of time constraints that could create gaps in the long run is the lack of opportunities for reflection and for building competent and confident work teams. The daily work can be simplified by checklists and routines, but if there is no time for reflection over actions and their consequences, professionals become less able to develop a profound knowledge of how things work. This compromises their ability to think creatively when something

unexpected happens, and when they have to let go of routines and start to improvise. One experienced head nurse said:

And how can you get personnel to know and feel safe in what they're doing? It all comes down to education... There has to be time for introduction—time to work with experienced people around you. There needs to be time for reflection and continuous learning too.

Fragmented duties and work schedules were also described as being detrimental to building the trust between professionals and patients that is essential for the patients' feeling of safety.

The patient time, when we actually work with the patient and create trust... Safety for the patient is something I create with the patient and here, in particular, with the family and patient. We create that together.

3.2 Managing the gaps created by the system

Gaps that occur in the continuity of cancer care are in most cases managed by the ability of professionals to adapt to unexpected situations, through reciprocal responsibility across professional boundaries, and by patients' involvement in care.

3.2.1 *Adapting to the unexpected*

Gaps occurring somewhere along a patient's cancer-care trajectory are usually discovered and managed by the personnel at the sharp end. The trouble when for example nurses discover prescription errors in chemotherapy plans or unaddressed test results is that they are not mandated to fix the problem on their own. This interrupts or delays the delivery of care. There is also a risk of such errors not being detected, especially when the workload is high.

We're everyone's backup. The last line of defence... I mean, even if everything goes wrong before the patient arrives... it has to work when we begin treatment... And even if you correct an error and nothing happens...there is a risk that you don't discover it the next time, especially if patients are waiting and you are under stress.

One thing consistently mentioned during the interviews was the fact that existing checklists and control functions do not cover all mishaps that could occur along the care trajectory. In certain situations, the professionals take shortcuts and improvise even though they are aware that this might create risks and lead to mistakes.

No matter how many checklists we have—there are many things that can distract you along the way. Even though you've prepared everything methodically, there are still things waiting and creating stress. So you skip the routines in that one case, just to make things work faster. When you are under stress you often make errors in judgement and get things mixed up. Then there's a risk that things go wrong.

3.2.2 *Reciprocal responsibility across professional boundaries*

The junctions between different hospitals, specialties, professions and levels of care are some of the critical points where the cancer-care system is fragile and gaps are frequent. Participants in the interviews described gaps in the handover of information, responsibility and knowledge across boundaries at different levels of care. Someone put it as follows: 'It feels like handing over the baton and not knowing if anyone receives it.' Although efforts are done to coordinate care over professional boundaries, it is difficult to bridge the gaps:

And we work with many different clinics—and, for example (mentioned a hospital). They have other routines. That can be a flaw. Although it's practically impossible to get everyone working in the same way. And it's very difficult when it's spread out over such a large area.

Trans-professional therapy conferences, where teams of specialists meet and discuss test results and treatments, were identified as creating 'horizontal' lines of communication between different specialties. It was agreed that such conferences could be an opportunity to detect errors and to eliminate unnecessary treatments and waiting periods for the patient. If experts find it difficult to prioritize and attend these conferences, it means that important knowledge and information is lost, which in turn may lead to incorrect or postponed decisions. Patients and their families do not always get an invitation to participate in treatment conferences and decision-making, and this causes further problems when treatment is given.

They don't get to meet their doctor... I see that as a safety issue... That's when things can go wrong. The reason is a resource issue. There is a doctor in charge of the patient, but patients maybe don't meet a doctor before treatment, and therefore they have not been informed when they come in for treatment...

Gaps may also occur at occasions when two or more professionals share the responsibility for a task. One example referred to was that a student had been delegated

to check a patient's level of blood sugar before breakfast and report back to the nurse, but the student and the nurse did not have the same understanding of how to set this up. A reciprocal responsibility would have required the nurse to ensure that the student had understood the task to be performed, and the student to verify that he/she had understood. Another example given was the reciprocal responsibility for appropriate transfer of information between professionals over caregiver boundaries:

Whoever sends a patient here is responsible for giving us the information we need to move forward. And it's our responsibility to find out everything we feel that we can find out or that we need to know.

3.2.3 *Involving the patient in care*

One strategy for managing information gaps that was not obvious to all of the interviewed professionals was to involve patients or their family members in decisions about treatment and care. It was stated that well-informed patients are in a better position to take a part of the responsibility for their care and thus contribute to preventing or mitigating potential gaps. One nurse gave an example of how the involvement of patients in their own treatment may focus the nurse's attention:

Many are very familiar with these things themselves. So we have to be up-to-date when we visit a patient. Because they ask a lot of questions. They'll ask, like if the dosage is reduced by 20 % - 'From what? From when the treatment started or from the last time I got the treatment?' So we need to be up-to-date all the time.

Getting patients or relatives involved in care requires that they are informed about essential facts, like care plans for the near future ('If you haven't heard anything within three weeks, call us'), or which symptoms that are normal and which symptoms that the patient should pay particular attention to. Some of the interviewed professionals described how they tailor information and provide detailed instructions about what is important in emergency situations, both orally and in writing: 'If you get a fever during the weekend, call this number. Put the note on the fridge, so you'll find it quickly.'

3.3 *Different perspectives at the sharp and blunt ends of the system*

A discrepancy was seen between how representatives from the sharp and the blunt ends of the system described their efforts to accomplish safe care. Managers at the blunt end

described their efforts to implement laws and regulations into the system, while practitioners at the sharp end struggle to maintain a good care *and* to comply with the laws and controls that exist to ensure that the care is safe. Many nurses find it difficult and time-consuming to search for necessary instructions about procedures and regulations when they are in an unfamiliar situation. When nurses are faced with administration of a new drug or use of new medical equipment, their most common solution is to consult other colleagues. Some of the managers also questioned the benefits of their work with operational plans and procedures, since they saw the discrepancy between paperwork and reality.

We're always talking about putting the patient first. As a manager, you can always tell your staff that the patient always comes first. And you get away with a lot of things by saying that. We even have that in our operational plans and on our economy and governance cards. All too often it's just on paper.

The professionals at the sharp end were disappointed about the way in which incident reports are handled higher up in the healthcare organization. They described how their engagement in their work and trust in their leaders' management have decreased when their efforts to report incident have not brought about any visible changes.

We present a lot of ideas. They get stuck somewhere. I wonder how many adverse events we have noted down over the past three years. But is there ever any change? In the end, you become resigned and stop reporting things.

4 Discussion

The main results from this study indicate that continuity in cancer-care trajectories largely depends on the degree to which professionals at the sharp end of the system are able to anticipate, detect and act upon gaps in their daily work. This study also confirms that even though the gaps in most cases are detected and cause no harm, they do give clues about fragility in the healthcare system. In unexpected situations, and when several latent risk factors like time constraints and inexperienced personnel appear simultaneously, there is also a risk that gaps are not detected and corrected for. Thus, gaps identified at the sharp end of the healthcare system must be taken seriously by those at the blunt end who are responsible for designing the system.

4.1 Anticipating and detecting gaps

The professionals interviewed in this study anticipated and detected gaps especially where the interface between the

patients and professionals involved in the patients' cancer care was limited. Gaps in the continuity of care could for example appear as a lack of communication between the patient and the system and between different professionals in handover situations, e.g., between shifts, between different professional specialties or across organizational borders. Consistent with results from other studies, gaps such as loss of information, delayed response to abnormal test results and missed opportunities for healthcare screening were detected when patients were transferred between different levels of care (Caines et al. 2011; Forster et al. 2004; Tandjung et al. 2011). The professionals' sensitivity to worries underlying the patients' questions and their ability to act according to their gut instincts were crucial for providing safe care. Mistakes could be avoided by calling the patient for a follow-up consultation or asking colleagues and experts for a second opinion. Experience-based knowledge of the kinds referred to above develops through awareness and reflection during daily work but also through structured reflection together with colleagues (Gustafsson et al. 2009). Encouraging professionals to seek a second opinion and creating opportunities for structured reflection and open discussions on difficult cases may save time in the long run and improve safety. Such strategies may for example help professionals to think of other scenarios when they are stuck in their mental rut, and thus prevent diagnostic errors (Arzy et al. 2009; Scott 2009).

The participants in the interviews also anticipated and detected gaps occurring in the interface between humans and technology when advanced medical equipment and treatments were applied. New technology is often introduced without stringent testing and quality-assurance programs. This raises the question of a need for a clearer legislation on healthcare professionals' technical competence and skills. In contrast to other sectors, such as the nuclear industry (SSMFS 2008:1), the Swedish healthcare system lacks requirements for recurrent competence checks. There may be reason to introduce mandatory training of staff and examination of technical knowledge among healthcare professionals, especially when new personnel is employed or when employees return after lengthy absences. Learning from other high-risk organizations, healthcare systems could improve safety further by implementing 'safety audits' of all operational changes, such as introduction of new methods, equipment or organizational structures (Patterson et al. 2004; Reiman and Pietikäinen 2010). Regular inspections may help to identify latent weaknesses such as deficits in professionals' medical and technical knowledge and skills. There may also be reason to develop and use a set of indicators of potential changes of the healthcare system that could compromise its safety performance (Reiman and Pietikäinen 2010). Such attempts to anticipate organizational failures would be a

way of applying ‘feed-forward control’ (Hollnagel et al. 2008) rather than a traditional feedback-based safety management built on past outcomes.

4.2 Managing gaps

The narratives in this study clearly depict the organization of cancer care as resembling a silo (Glouberman and Mintzberg 2001). This structure complicates the transfer of care from one clinician to another or across organizational boundaries (Arora et al. 2008). Information and communication are indispensable for a cohesive care (Siemsen et al. 2012), and in this study, reciprocal responsibility for information transfer has been described as an effective tool for preventing gaps at professional boundaries.

A high workload was consistently said to counteract opportunities for communication, and gaps frequently occurred when professionals were faced with time constraints and a lack of competence. Such organizational factors are often a result of decisions taken at the blunt end of the system, without sufficient insight regarding their consequences (Woods et al. 2006). These decisions may in their turn derive from factors such as political and economic driving forces. Our study illustrates how brittleness in a system becomes evident in near-failure situations. Medical mishaps were described to take place when factors like shortage of experienced staff and time constraints occurred simultaneously with gaps such as a lack of medical prescriptions. In such situations, one interviewee felt like a ‘ticking bomb’, while another one felt like ‘handing over the baton and not knowing if anyone receives it.’ However, most gaps were anticipated and identified and their consequences avoided by work done at the sharp end. A picture emerged of how well-trained and experienced professionals could ensure safe care even when the conditions were poor (Cook and Rasmussen 2005; Hollnagel et al. 2008). Still, little is known on what healthcare professionals actually do when they anticipate, detect and handle unexpected situations in their daily work in order to maintain a safe and cohesive care. Direct studies of the ‘messy details’ of real work (Nemeth et al. 2004) will be essential if we are to understand how an organization remains robust and resistant to disturbances (Hollnagel et al. 2008).

This study has shown how patients’ involvement in their own care could be a resource that bridges gaps. Rather small efforts were described as helpful—for instance, getting patients involved in care plans and decisions about their treatment could provide a doublecheck that makes it easier to identify prescription errors at the sharp end. Some of the interviewees also mentioned that medical mishaps could be prevented by giving information about side effects that the patients should be aware of, or phone numbers to

call in acute situations. However, these examples were anecdotal, and the efforts to include patients in their own care were not made systematically.

The Swedish Patient Safety Act (SFS 2010:659) puts the patient in the center of care. It requires that a person’s treatment and care remain in his or her own control and that clinicians see it as their task to serve their patients and involve them in all relevant decisions. A person-centered care, based on a shared understanding and commitment by all involved, may constitute the core of a safe and seamless health care. A recent investigation by Sweden’s National Board of Health and Welfare (Socialstyrelsen 2011) indicates that patients and family caregivers can be an important resource for preventing gaps in the continuity of care and lowering healthcare costs. Other studies suggest that patients appreciate participating in decisions about their own care and treatment, and that they can prevent incorrect medication, report errors and bridge gaps that occur in their care (Doherty and Stavropoulou 2012). Nevertheless, a recent study of physicians’ view on patients’ participation in medical decision-making shows that elderly patients with multimorbidity are usually not involved since this is considered too complex and time-consuming (Ekdahl et al. 2012). This calls for empirically evaluated methods for integrating and safeguarding the patients’ and their family caregivers’ involvement in patient safety.

4.3 A systems perspective on gaps

Both managers and clinicians were aware of gaps that could lead to medical mishaps, but the efforts made to ensure safety were perceived differently at the blunt and sharp ends of the system. The professionals at the sharp end were well aware of rules and regulations about procedures and treatments. In their daily work, however, they tried to find shortcuts to circumvent such procedures in order to perform their duties efficiently. According to the ‘ETTO-principle’ (Efficiency-Thoroughness Trade-Off), work is usually governed by a balance between efficiency and thoroughness (Hollnagel 2009). As long as work is performed without mishaps, shortcuts are generally encouraged within an organization. Managers at the blunt end of the healthcare system at times doubted the benefit of their ‘paperwork’, since it often did not fit into the ‘real world’ of daily work. Professionals at the sharp end expressed frustration since their reports on adverse events usually did not lead to any visible change and because there was no shared vision of how the problems could be solved.

This dilemma highlights the persistent barriers that are embedded in healthcare organizations (Edmondson 2004). Several studies indicate that resilience engineering can improve an organization’s ability to handle high-risk

situations (Hollnagel et al. 2008; Nemeth et al. 2008). However, even though clinicians at the sharp end constantly anticipate and adapt to gaps and ‘mistakes’ that appear in the system, this does not mean that the gaps go away. The success of a resilient organization can create an unfounded impression that the system is well-designed overall. This emphasizes the need for openness for bidirectional communication between the blunt and sharp ends of the system. Such openness facilitates vigilance and learning about underlying systematic patterns that can produce failures (Schilling et al. 2011). Designing resilient care organizations that enable professionals at the sharp end to prevent gaps or mitigate their consequences relies to a great extent on management’s responsibility to address gaps identified in the system.

5 Implications

Even though this study was based on cancer care, the main results could also be applied to other settings, such as care of the growing population of elderly or persons with multiple and complex syndromes. The study indicates that the continuity of care could be improved by a mutual responsibility for the transfer of information and knowledge across professional boundaries, by patients’ involvement in decisions about treatments and care plans, by encouraging professionals to seek a second opinion, and by creating opportunities for structured reflection and open discussions on difficult cases. The extent to which gaps could be managed by professionals at the sharp end was largely determined by their ability to anticipate and adapt to complex and unexpected situations in their daily work. However, to be able to systematically improve patient safety, we need to know more about how people at all levels in healthcare organizations actually manage complex situations and unpredictable events. By putting the magnifying glass on the messy details of real work (Nemeth et al. 2004), we may capture the deep substance of how safety is created.

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