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**USE OF INCIDENT DATA FOR IMPROVING PATIENT
SAFETY: A LITERATURE REVIEW**

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1 INTRODUCTION

Incident reporting systems are now well established in the National Health Service (NHS) in the U.K. as a result of government initiatives and stakeholders' efforts to invest in the necessary systems to avoid preventable adverse events and improve the quality of health care. The rationale for incident reporting systems is that they will enable NHS Trusts to learn from errors and accidents and implement improvements to care processes to increase safety. Despite the emphasis on incident reporting as a source of learning, there has been little empirical research examining how incident data is used to improve safety and whether learning from incidents is effective. The aim of this working paper is to selectively review the research that has been conducted in this area and identify areas for potential further study.

1.1 Background

The reporting of incidents and near misses has been seen as a crucial means of improving patient safety (World Health Organization 2004; Barach and Small 2000b; Pittet and Donaldson 2006; Runciman et al. 2006; Thomson et al. 2009). As a result of implementing incident reporting (I.R.) systems in the NHS, their use by healthcare professionals has resulted in large numbers of reports. As of May 2009, 94% of NHS Trusts in England had reported at least once to the NRLS in the past quarter. This amounted to 3,290,848 incidents in total (NPSA, 2009). High levels of reporting have been encouraged in order to facilitate lesson-drawing, with information from the reports being disseminated within Trusts and/or occupational groups as well as across Trusts by the National Reporting and Learning System (NPSA 2006; World Health Organization 2005).

The emphasis on learning from incident data is very strong. For example, the Department of Health report "An organization with a memory" stated that health care practitioners learn from such information and help make the NHS

alert to potential threats to patient safety (Department of Health 2000). The analysis of previous incidents and near-misses provides “free lessons”, which can “work like ‘vaccines’ to mobilize the system’s defences against some more serious occurrence in the future” (Reason 1997: p. 119). Incident reporting has been described as “mak[ing] sense in the absence of clear alternative and cost effective systems for identifying adverse events” (Cook 2000: p. 242).

Despite this wide use of I.R. systems geared towards ‘learning’ (NPSA 2006; NHSLA 2009), there is little information about how learning occurs and how it could be improved. In the healthcare literature, discussions about incident reporting have focused more on how many incidents are reported and how they are classified rather than on how the data are used to address weaknesses in processes and produce safer care (Battles and Stevens 2009; Shojania 2008). Our previous working paper also focused primarily on factors affecting the willingness to report patient safety incidents, and did not consider to a great extent how organizations (both Trust and sub-Trust bodies) use the incident data generated by reporting systems (Kodate and Dodds 2008). What existing literature on this topic suggests is that learning does not always occur, or even if it does, there is little evidence of sharing lessons among frontline staff and there is little awareness of impact of learning on practice.

For example, the NHS Staff Survey, published annually by the Healthcare Commission (now the Care Quality Commission, CQC) since 2003, features a series of questions concerning errors, near misses and incidents and how they are perceived to be handled by each Trust. However, the questions are focused primarily on incentives and hindrances to staff reporting, rather than what they learn from them. Looking more widely outside the U.K., there is a survey in a cancer centre in Canada, which indicated that less than half of the staff positively rated the organization’s ability to learn from incidents (Cooke et al. 2007: p.347). Moreover, there is little acknowledgement in the patient safety literature of the complexity of healthcare organizations and the fact that if learning is to occur effectively it will involve different levels of the organization and entail multiple feedback loops and flows of information.

There is a vast literature on organizational learning and knowledge management within organizations (Argyris and Schön 1978; Nonaka and Takeuchi 1995; Senge 2006). Drawing on the work of Fiol and Lyles (1985) and Huber (1991), organizational learning is defined as the process of changing organizations' behaviours and improving actions through their processing of information. In this paper, we restrict our attention only to work, which has direct relevance to our study investigating the use of incident data within healthcare organizations.

This paper also adopts a multi level perspective of learning in which learning occurs at the organizational level, the team level and the individual level (Hoeve and Nieuwenhuis 2006; Hollnagel 2005). We have used this perspective to create a model of how incident data can be used for learning at each level of the organization, as shown in Figure 1. In our model, learning at the organizational level refers to a set of activities such as taking corrective action following patient safety events and near misses, dissemination of safety practices across the organization and assurance that a control mechanism is in place to prevent similar adverse events from happening again. Learning at this level, therefore, includes information sharing and decision making on corrective actions at a senior level trust-wide meeting and monitoring and evaluating systems improvement.

At the next lower level, team-based learning is the key to addressing process failures and implementing immediate and effective changes on the ground after incidents and near misses, due to the devolved nature of incident review meetings in healthcare organizations. However, little research has been done to examine how different professionals interact, communicate and make decisions within a team following patient safety events. In the absence of previous research in the field, this paper looks at two factors: team working skills and group decision making, by drawing on relevant literature.

Finally, the individual level refers to how individual members of staff learn about safe practice. At this level, barriers to learning from incident data for

frontline staff will be identified. These include emotion, lack of or inappropriate reflection, inappropriate or poor education, and limits to case-based learning as well as limited patient safety feedback, all of which have implications for both Trust-wide and team-based learning.

Since the goal of achieving safer care is to be shared amongst all stakeholders at every level of the organization, the boundaries between the three levels are rather arbitrary. However, the model is useful for the purpose of this literature review, and it will be populated by themes found in the literature at the end of this paper.

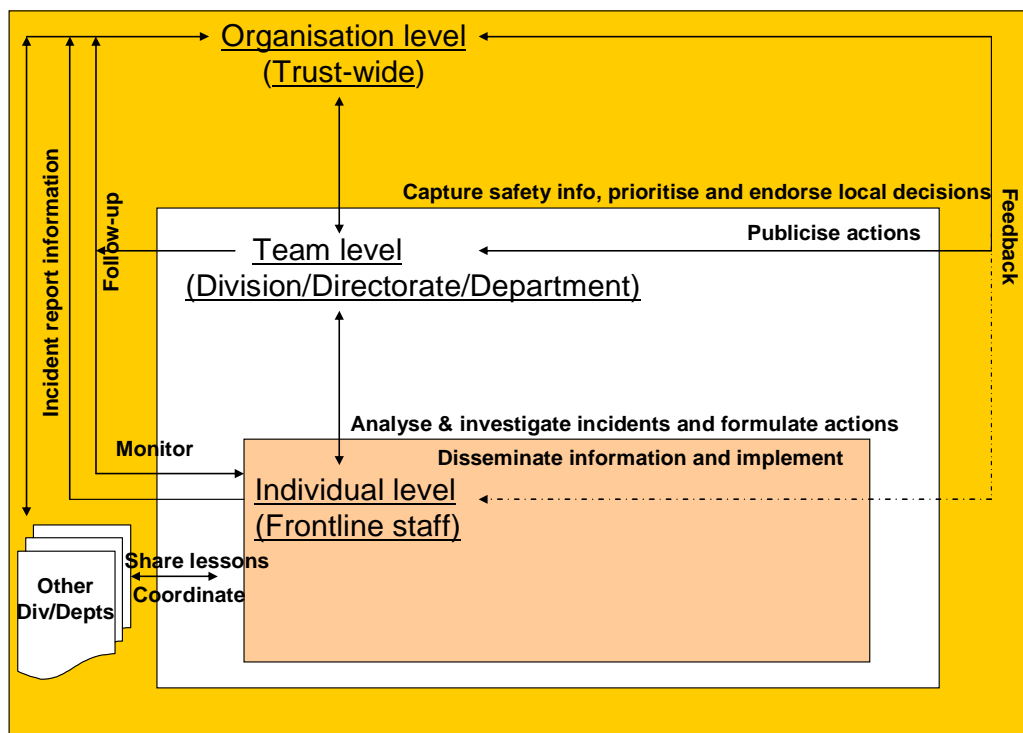


Figure 1. Multi-level model of learning from incidents (adapted and extended from Hoeve and Nieuwenhuis 2006)

1.2 Aim

The overall aim of this working paper is to identify existing research into how organizations, teams and individuals use incident data to improve patient safety. A secondary aim is to identify gaps in the knowledge base that need to be filled in order to increase the effectiveness of learning from incident data.

The following sections review the existing literature about how healthcare organizations use incident data at the organizational level, the team level and the individual level. In each section areas for further research and investigation are identified. At the end of this paper, there will be several research questions to be further explored in future studies.

2 USE OF INCIDENT DATA AT THE ORGANIZATIONAL LEVEL

The use of incident data at the organizational level is constrained by a number of factors that have been identified in studies of healthcare organizations. Learning on the organizational level is complex “partly because learning is vicarious rather than enactive, hence has to be mediated, and partly because a number of people and/or organisational functions may be required for learning to take place” (Hollnagel 2005: p.908). Learning from failures within healthcare organizations involves a series of actions, including detection of an incident, analysis of and investigation into an incident, making decisions on corrective actions, implementation and evaluation. The following subsections will primarily highlight the hindrances to effective learning at the organizational level in those processes of monitoring and analysis of incidents.

2.1 Managerial structures

The literature shows how barriers to learning from reported incidents can be affected by the ‘people-centred and people-driven’ nature of the healthcare system in contrast to other industries which are technology-centred (Van Cott 1994: p.55). The interface with the patient is fundamental to healthcare organizations, and their service (i.e. care for patients) is often not seen as a product. The complex aims of health service providers results in a lack of clear accountability and lines of authority between medical professional groups, which is frequently mentioned as a source of tensions and therefore constitutes a barrier to team work and knowledge sharing within the organization (Barach and Small 2000a; Currie and Suhomlinova 2006).

Hignett (2003) argues that ‘a hospital is not only multi-professional, but has the additional problem of at least three managerial lines. There will be a clinical line for the management of the patient, a professional line (e.g. for medical staff) and an administrative line for each service area (e.g. surgery)’ (p. 888). To remedy this problem, there has been a drive for specific committees and named individuals to champion safety, quality and risk elimination. However, Storey and Buchanan (2008) argue that ‘merely instituting structures and new roles does not guarantee effective organizational change or behavioural change’ (p. 649). These committees need to have a strong link “upwards” to the strategic level and also “downwards” to clinical teams.

These macro-level organizational factors need to be borne in mind when examining how incident data are used. Although the emphasis on a systems approach to increasing patient safety has shifted the focus away from blaming individuals (Vincent et al. 1999; Catino 2008), little effort has been made to clarify what organizational learning actually means to different actors at multiple levels (e.g. individual, system and group level) (Carroll 1998; Edmondson 2004).

2.2 Difficulty of engaging frontline staff

The general absence of local participation of frontline staff in the process of analysis of and learning from adverse incidents is noted as a peculiar feature of the IR system in the NHS, compared to that in other industries such as aviation (Macrae 2007). One reason for this is that reporting duties and compliance with external regulatory bodies such as the NPSA, the MHRS and the CQC can be seen as a top-down monitoring exercise. As a result, the central oversight mechanism of data collection and analysis at the organizational level is also perceived by some professionals as a bureaucratic tool (Waring 2007; Amalberti et al. 2005). This contrasts with learning about safety in communities of practice, which is a more profession-based, bottom-up, and informal channel (Gherardi and Nicolini 2000; Wenger 1998; Wilkinson et al. 2004). Carroll also points out the separation between

executive (i.e. managers) and operating staff as an obstacle to proactive and effective learning from incident reporting (Carroll 1998).

However, not all the external regulatory activities are perceived as negative and unhelpful by the professional groups. On the contrary, in primary care, a relatively low salience of both medical errors and professional regulation has been a major factor for its slower progress in the field of patient safety initiatives and research into learning from incidents as compared with acute care (Dodds 2009). Additionally, the effectiveness of local I.R. systems can be questioned by healthcare professionals, as other mechanisms of reporting at a national level could produce tangible results such as a change of practice. These include the National Confidential Enquiry into Suicides and Homicides by People with Mental Illness (NCISH) for mental health services and the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) for acute health services.

Reports and data collected nationally by those agencies can act as a catalyst for an organizational change with a stronger emphasis on the commitment of the managerial staff to patient safety. For instance, surgeons who contributed to NCEPOD saw their report as 'positive ammunition' for committing their Trust's management to additional investment in preventing problems from recurring in the future (Coles et al. 2001: p. 35). Professionals' participation is discouraged not always by external regulatory mechanisms, but by a lack of commitment by management or insufficient resources within local organizations. Therefore, although barriers to reporting and learning from incidents and near misses do not solely result from professionals' resistance to these external regulatory requirements, compared to other existing alternative mechanisms, the effectiveness of I.R. systems has not been proven and is often questioned by their main users (i.e. frontline staff).

2.3 Culture of learning: first order learning

Several studies of healthcare work have found that healthcare is characterized by a culture of short term problem solving. In a study of nurses' responses to system failures in ward environments, Tucker and Edmondson

(2002) argue that problem solving in healthcare often involves short term remedies rather than organizational changes that would prevent the same problems from recurring. They argue that short term problem solving (i.e. first order learning) is fostered by a culture that expects healthcare practitioners to take individual responsibility for solving problems. Other factors that contribute to short term problem solving include the drive for efficiency and productivity (Amalberti et al. 2005) that means that hospital staff have little time for more extensive problem solving and the lack of managers who can operate to solve problems arising across departmental boundaries. To overcome this deeply-seated culture in health care, the use of systematic processes for reflecting on action at the organizational level has been recommended as an effective approach. This method is based on the tradition of work-based learning, which is well-established at the individual level, particularly with nurses (Nicolini et al. 2004; Lockyer et al. 2004). However, there is as yet no evidence that the model can be applied to the use of incident data to improve safety.

Wiig and Aase (2007) conducted a study in Norway, looking at learning practices from incidents at multiple levels (government, regulatory bodies, hospitals, management, staff and work operations) and their interfaces. They concluded that error reporting systems in their current forms function as a bottom-up feedback mechanism, and that the impact of learning, if any, is limited to local corrections and new routines within a confined domain, due to underreporting and the lack of effective feedback mechanisms (p.10). In conclusion, the I.R. system at the moment is not used successfully to overcome these problems and address difficulties by creating sustained changes to working practices.

2.4 Information exchange and knowledge transfer within organizations

Another feature of health care organizations that has been underlined as a potential problem is the capacity of organizations in relation to information sharing and knowledge transfer (Rakich et al. 1992; Longest and Klingensmith 1997). Drawing on the work of Rakich et al, Longest and

Klingensmith examined different flows of information (downward, upward, horizontal and diagonal) and argued that 'the least used channels of communication in health care organizations are *diagonal flows*' (Longest and Klingensmith 1997: p.243). A diagonal flow of information cuts across functions and levels, and can be channelled through committees, task forces and cross-functional project teams consisting of members from different levels of the organization. This is particularly pertinent to the use of incident data and how lessons learnt can be shared among members of an organization.

A study of intra-organizational communications demonstrates that informal communication through horizontal and diagonal flows is an important channel but is a relatively rare occurrence in healthcare organizations. Informal communication refers to 'channels that result from interpersonal relationships of organizational participants' and if properly managed, is conducive to effective coordination among individuals and teams (Longest and Klingensmith 1997: p. 245). Reagan and McEvily (2003) found that social cohesion between members of different groups was an important component of high-quality information exchange, as it affects the willingness and motivation of individuals to invest time, energy and effort in sharing knowledge with others. Whether individuals feel comfortable within their affiliated group is therefore the key to the success and/or failure of sharing information and transferring best practice amongst its members (Kelley and Thibaut 1978).

The emphasis on cross-departmental, multidisciplinary team meetings and information communication channels is relevant, but highly abstract and therefore needs to be placed in a specific organizational context and investigated. Further study of multidisciplinary team meetings in healthcare should investigate how information about safety is disseminated across the organization.

2.5 Accident investigations

A necessary condition for learning from incidents is a high quality investigation to identify the causes of incidents. The quality of medical incident investigations has been criticized by various researchers (Woloshnowych et

al. 2005; Nemeth et al. 2004; Vincent et al. 2000). Vincent et al. (2000) argued that investigations are essential to learning, but they need to be embedded in the process of developing prevention strategies if they are to enhance patient safety. They recommended the use of a formal protocol in order to ensure a systematic investigation that avoids simplistic explanations and the routine assignment of blame. Woloshynowych et al. (2005) reviewed work on methods of accident investigation in both high-risk industries and healthcare and examined their strengths and limitations. They underlined the importance of a systematic evaluation of each investigation method introduced in healthcare so that learning will be ensured across the sector, and not confined to individuals and teams. Nemeth et al. (2004) argue that “the thorough, objective investigation of medical adverse events rarely happens due to the complexity of the environment, litigation, risk, and socio-political implications” (p.2084). Additionally, in mental health, the long duration of the process of structured investigations and public inquiries in serious cases has been pointed out as negatively impacting on learning from incidents (Clarke 2008; Patterson and Leadbetter 2004)

Underlying factors explaining the inadequacy of investigations include the lack of resources, unfamiliarity with investigation methods, distracting media attention, legal exposure and ambiguity surrounding the definition of standard care processes within a complex case mix environment.

Other obstacles to learning mentioned in the literature include a lack of impartiality in investigations, and turf wars amongst divisions and among different fields of practice such as surgery, pharmacy and anaesthetics (Johnson 2003). In the broader context of safety-critical systems, Johnson emphasises the danger of poor investigatory and analytical procedures and inadequate risk assessments, flawed systemic or individualistic views of failure and reliance on reminders and quick fixes (Johnson 2003: p.919-920).

2.6 Audit and evaluation

There is a need for better coordination and systematic assessment of how changes are made and evaluated after the implementation of changes following the investigation of incidents. A NAO report in 2005 found that few trusts had calculated the cost of specific patient safety incidents or undertaken an analysis of the savings made by intervening to improve patient safety (NAO 2005: p.43). Although there are a number of reasons for the failure to evaluate safety improvements in healthcare, cost and capacity issues are normally raised. Even when medical audit is carried out, the lack of resources can be an obstacle. “It was felt that leaving changes identified as required by the analysis unresourced would rapidly bring the system into disrepute” (Coles et al. 2001: p.44).

The importance of integrating patient safety data from various sources (e.g. complaints and litigation claims) is also underlined (Rivard et al. 2006). Grol and Grimshaw (2003) underline the difficulties of implementing changes to daily practice and emphasise the importance of further research to find the crucial determinants of effective change for safer care. In order to close the loop of the implementation process, it is necessary to “define indicators for measurement of success and monitor progress continuously or at regular intervals” (p.1229). Although this is a challenging task for healthcare organizations with scarce resources and complex dynamics amongst actors, research evidence can provide a strong case for embedding sustainable change for safer practices at the organizational level.

It is necessary to investigate further how these general organizational barriers such as the limited (generally only first-order) nature of learning following incidents, multiple lines of responsibility for implementing change and the general lack of frontline staff participation are impacting on use of incident data. Perceptions of frontline staff about how they best learn about safe practice need to be examined and analysed in a more systematic way.

3 USE OF INCIDENT DATA AT TEAM LEVEL

Using the word, 'workgroup', rather than 'team', Hollnagel (2005) argues that "(l)earning on the workgroup level can be direct or enactive, but also indirect or vicarious." When failures involve primary functions on the workgroup (e.g. communication or coordination), it is direct learning. However, a closely-knit unit or a collective entity benefits from indirect learning such as learning by observing others or sharing information of other members' mistakes. (p.907) Therefore, in order to understand how the data from IR systems can be used for changing work practices, a special focus needs to be placed on this team level. Nelson (2002) calls this 'microsystem' of healthcare organization, which he defines as "the small functional front-line units that provide most health care to most people...and the building blocks of larger organizations" (p.473). Hackman's study of eight patient care teams at two hospitals also confirms the importance of lower levels of analysis. They found that a great variety of medication errors could only be understood by examining "the nurse managers' latitude to hone the design of their teams and establish their own preferred norms of conduct" (Hackman 2003: p.912). The findings demonstrate the importance of the team level in discussing the causes of errors and changing care processes following incidents.

3.1 Team working skills

Team working problems have been noted as an important factor in the occurrence of errors (Donchin et al. 2003; Helmreich and Schaefer 1994; Flin et al. 2003; Catchpole et al. 2007; Gaba 1989; Yule et al. 2006; Finn and Waring 2006). Donchin and colleagues investigated the nature and causes of errors in an Israeli ICU over a period of 4 months. The findings show that verbal communications between physicians and nurses accounted for a high percentage (37%) of the error reports, despite being observed only in 2% of activities recorded during the 24-hour observations (Donchin et al. 2003: p.145). Difficult relationships between different professional groups are not conducive to collectively learning to work together and finding solutions. Alamberti et al. (2005) refer to a "craftsman" mindset to describe the professional silo structure which inhibits the collective learning process and limits opportunities for learning. Catchpole et al. (2007) also found that

complications during operations can arise from an escalation of smaller problems, which relate to a number of non-technical skills. These complications could be traced to individual errors by members of the team, failures in group processes and the conflicting demands placed on members of the operating team (p.107). Training in team working as well as broader communication skills has been identified as an important area for improvements in order to prevent patient safety incidents (Reader et al. 2006; Leonard et al. 2004; Flin et al. 2008)

When it comes to learning from incidents, previous research emphasises the significance of team-learning and the importance of providing space and opportunities for formal and informal discussions without fear of recrimination (Edmondson 2004; Firth-Cozens 2001; Carroll and Edmondson 2002). Eisenlohr et al. conducted a six-month, case-based learning intervention at five Veteran's Administration hospitals in Ohio, the United States, and their study was particularly designed to shift the focus from the individual to systems which could promote learning from incidents. One of their findings was that most of the learning occurred during group discussions as opposed to coming from more formal feedback mechanisms such as newsletters (Eisenlohr et al. 2002).

The general lack of communication skills and its implications for learning from incidents are not restricted to any specific specialties such as anaesthetists and surgeons, but also apply to the management body and healthcare sector as a whole. It has been suggested that the lack of sharing lessons learnt across different clinical divisions and healthcare organizations has been striking, compared to other high-risk industries (NAO 2005). "Individuals may learn and adjust their practice, but the learning processes occur in a vacuum" (Leape 2005 quoted in Wiig and Aase 2007: p.10). This may be caused by a combination of factors such as ineffective feedback and "a prevailing culture of unease about personal scrutiny" in the NHS (Catchpole et al. 2007: p.108).

3.2 Group decision making

Moorhead et al. shed light on the implication of group decision fiascos for safety critical industries, by investigating the disaster of the space shuttle Challenger (Moorhead et al. 1991). They identified in the Report of the Presidential Commission on the Space Shuttle Accident (1986) all of the eight symptoms of Janis' concept 'groupthink'. These include: excessive optimism, rationalising warnings, unquestioned belief, stereotyping the opposition, pressure on dissent, self-censorship, illusions of unanimity and mind-guarding (Moorhead et al. 1991: pp.542-545). They also found that time pressure and leadership style in this particular case played a moderator role and worsened the symptoms. In another study of decision making in an organization, group size and the allocation of responsibility for individually assigned tasks are stressed as important factors for deciding the quality of the decision making process in an organization (Ingham et al. 1974; Latane et al. 1979). In incident review meetings in the healthcare setting, strong pressure for quick decisions and social conformity also needs to be taken into consideration, as suggested by Henriksen and Dayton (2006).

The findings underscore the importance of investigating how members of staff at different levels of an organization discuss incidents and agree on appropriate actions. It is also important to probe into how the information is filtered through various communication channels. In our study, a particular focus will be placed upon how the information is extracted from incidents and/or other sources and communicated to individual staff members.

4 USE OF INCIDENT DATA AT THE INDIVIDUAL LEVEL

In contrast to learning on the other two (organizational and team) levels, the focus of learning on the individual level is direct, enactive and therefore more straightforward. Individual members of staff experience the effects of the failure as the persons "at the sharp-end, i.e., the time and place where things do happen, where failures are made and noticed, and where the harmful effects often are released" (Hollnagel 2005: p.906). Learning on the individual

level is fundamental, because if individual members of staff do not learn how to provide safer care by making use of incident data, the teams and the organizations cannot learn from them either. This section looks at some important aspects related to individual learning and the potential obstacles to it. These include coping mechanisms, or the lack thereof, of frontline staff after incidents and practice-based learning within professional groups. Finally, as an important organizational tool to motivate the individual staff to share and learn from the incident data, the issue of safety feedback will be discussed.

4.1 Emotion

Emotional reactions can undermine the ability to learn from incidents and discourage healthcare professionals from admitting and reporting their mistakes (Bosk 1979; Braithwaite 2005; Vincent et al. 1999). Research focusing on the emotional impact of adverse events on health care professionals indicates that physicians and nurses clearly experience negative emotional responses and psychological distress after adverse incidents (Laposa et al. 2003; Christensen et al. 1992; Mizrahi 1984). Fear of being blamed and litigation can also inhibit learning (Rozovsky and Woods 2005: p.7). Manser et al. argue that healthcare organizations need to address the emotional needs of professionals in the aftermath of an adverse incident (Manser and Staender 2005: p.4).

4.2 Reflection

The process of learning from experience and by reflection has been addressed as an important aspect of medical practice (Atkins and Murphy 1993) and incorporated into some aspects of medical education (Al-Sheri et al. 1993; McCrorie and Cushing 2000). Reflective learning can be defined as “the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self and which results in a changed conceptual perspective” (Boyd and Fales 1983: p.99). Although reflective learning is widely used in health care, it is most firmly established in nursing practice (Clarke et al. 1996; Page and Meerabeau 2000), with its use in medical education for doctors being

relatively new. In 2003, the General Medical Council set out its recommendations, *Tomorrow's Doctors*, in which the need for medical students to be able to reflect on practice was underlined (General Medical Council 1993 (updated 2003)). Stephenson and Brigden (2008) argue that reflection is uncommon in clinical settings due to shortage of time and personal discomfort with exploring emotions.

4.3 Education

It is vital for a work environment to provide an open culture which encourages professionals to reflect on, critically analyse and discuss mistakes, if practitioners are to continue developing their ability to learn from mistakes (Howe 2003). Tucker and Edmondson (2003) suggest that there is a need to “reframe workers [sic] perceptions of failures from sources of frustration to sources of learning” (p.69). However, this can be a structural problem, rather than an individual one. Professional socialisation through education, training and practice in medicine has been identified as the major factor in shaping individual perceptions of mistakes and problematic behaviours (Lempp and Seale 2004; Fischer et al. 2006; Bosk 1986). In order to change the deeply rooted professional culture, which can encourage individuals to fail to admit their mistakes, medical education has been extensively revised and reformed (Lester and Tritter 2001; Howe 2003). New patient safety curricula have been introduced and students’ feedback has been investigated to explore scope for improvements (Mazor et al. 2005; Patey et al. 2007). Some of the findings suggest that longitudinal studies are required to assess the lasting impact of introducing new modules. For instance, it remains to be seen whether medical professionals’ future working experience after the introduction of the new curricula will achieve the goal of safer care (Patey et al. 2007).

4.4 Case-based learning in practice

Case-based learning, such as case presentations (often called Clinical-Pathologic Conferences (CPCs) and M&M (Morbidity and Mortality) conferences) is well-established as an opportunity for learning and widely accepted within health professional circles. However, Wachter et al. (2002)

argue that M&M and CPC conferences held in the traditional manner need not promote the goal of learning from errors. Such conferences can present errors as resulting from individual physicians' failings, particularly in surgical specialties. A strong focus is placed in this method of learning on enhancing an individual physician's knowledge base and technical skills to the level of perfection. "This unrealistic expectation of perfection undoubtedly contributes to physicians' traditional reluctance to discuss errors" (p.850). As an alternative method, Wachter et al. proposed Quality Grand Rounds, in which discussants focus primarily on diagnosing the system problems that led to a serious error or adverse outcome for a patient, rather than focusing on diagnostic or other individual errors.

4.5 Safety feedback

As much as error detection, feedback to front line clinical staff who have been involved in incidents is considered to be a prerequisite for focused improvements in patient safety (Shojania et al. 2001; Leape et al. 2002). Although the importance of feedback has been repeatedly mentioned by previous studies (Benn et al. 2009; Hogan et al. 2008; Barach and Small 2000b; Kaplan and Fastman 2003; Wallace 2006; Coles et al. 2001), its impact on individual professionals' behaviour and practice remains under-researched.

A study conducted by Coles et al. demonstrated that "the current lack of feedback following reporting of an incident creates a negative effect" (Coles et al. 2001: p.32). Limited feedback and repetition of similar incidents without resolution reinforces the image that "nothing ever changes". This could deprive staff of the motivation to work collaboratively towards safer care through IR systems. The same study found through interviews that there was a correlation between the level of completeness of incident forms and staff willingness to understand the issues that cause incidents and reduce the risk of reoccurrence (Coles et al. 2001: p.18). It also suggested that "feedback from local risk managers, general management and colleagues with suggestions and support for effective change is the most encouraging

stimulus to local reporting” (p.34). However, it is not clear what the best possible format for the feedback is. On this point, Coles et al. provide an example of a popular format among doctors: a single, bullet-point paragraph describing medical errors with brief recommendations (p.36).

Wallace explored different methods of providing feedback and how they were perceived by surveying staff. She discovered that information is generally disseminated by “reports, presented at meetings, or by letter in a minority of trusts” (Wallace 2006: p.167). Guidelines as a means of improving safety are generally perceived to be practical by staff, while feedback from incident investigations and consolidated information from incident databases, in drawing lessons learnt, are felt to be poor (p.173). Wallace’s report describes five modes of feedback. The first form is concerned with information provided to the reporter (bounce back information) in which acknowledgement of the report is provided. The second type is concerned with action within local work systems (rapid response action), which includes measures taken against immediate threats to safety and temporary fixes until the in-depth investigation process is completed. The third concerns the provision of information to all relevant front line personnel (risk awareness information). The fourth entails the provision of information to the reporter and the wider reporting community with regard to corrective actions and progress resulting from their report (informing staff about actions taken). The last type is similar to the second one, namely provision of information about action taken within local work systems, providing details of specific actions taken and implementation plans for permanent improvements to work systems, changes to the work environment, standard working procedures and training programmes (systems improvement actions). Evaluation and/or monitoring of effectiveness of solutions are also included in the last category (p.175).

Wallace’s in-depth study of feedback proposes fifteen system requirements for effective safety feedback, although in her recommendations she went beyond issues revealed by the survey responses. These requirements include: that feedback be considered reliable and credible by front line staff;

and that feedback be provided through the appropriate channel in the most practical format.

5 CONCLUSION

Despite widespread use of I.R. systems, there is as yet insufficient research demonstrating how to make their use more effective. There is little empirical data to suggest the extent to which clinical staff from consultants to allied health professionals learn about patient safety issues, using the incident data. It is therefore essential to examine how people currently experience the I.R. system at different levels (e.g. Trust level, clinical department level, and individual level) of organizations, in particular, frontline staff. It is only after we have gained an overview of how the system is currently used that we can develop a way of ensuring the I.R. system is embedded as an integral part of error detection in order to prevent future adverse incidents.

The following diagram, shown at the beginning of this paper, is populated with the findings from this literature review.

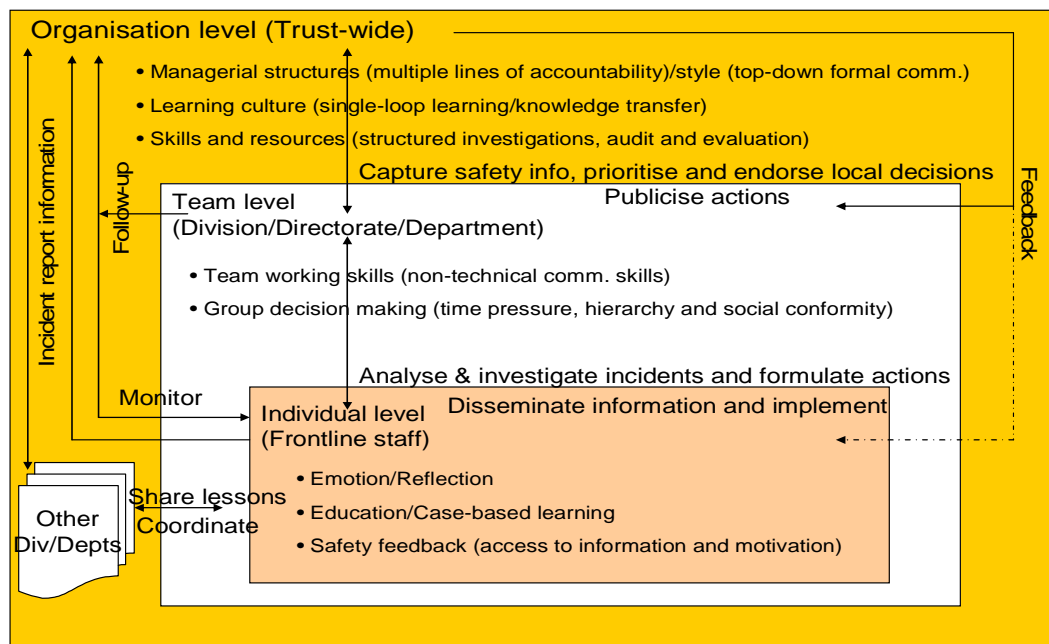


Figure 2. Multi-level model of factors that impact learning from incidents

Our research questions are three-fold. At the organization level, we question how incident reports lead to system improvements. At the team level, we ask how clinical teams use incident data to make improvements. Finally, at the individual level, we investigate how members of staff learn about safety issues and most importantly and how information about previous incidents impact on their practice. This research ultimately aims to promote a better understanding of the use of incident data and how it can be used as a means of preventing future errors and mitigating risks to patient safety.

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