



Categorizing Errors and Adverse Events for Learning: A Provider Perspective

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Abstract

There is little agreement in the literature as to what types of patient safety events (PSEs) should be the focus for learning, change and improvement, and we lack clear and universally accepted definitions of error. In particular, the way front-line providers or managers understand and categorize different types of errors, adverse events and near misses and the kinds of events this audience believes to be valuable for learning are not well understood.

Focus groups of front-line providers, managers and patient safety officers were used to explore how people in healthcare organizations understand and categorize different types of PSEs in the context of bringing about learning from such events. A typology of PSEs was developed from the focus group data and then mailed, along with a short questionnaire, to focus group participants for member checking and validation.

Four themes emerged from our data: (1) incidence study categories are problematic for those working in organizations; (2) preventable events should be the focus for learning; (3) near misses are an important but complex category, differentiated based on harm potential and proximity to patients; (4) staff disagree on whether events causing severe harm or events with harm potential are most valuable for learning. A typology of PSEs based on these themes and checked by focus group participants indicates that staff and their managers divide events into simple categories of minor and major events, which are differentiated based on harm or harm potential.

Confusion surrounding patient safety terminology detracts from the abilities of providers to talk about and reflect on a range of PSEs, and from opportunities to enhance learning, reduce event reoccurrence and improve patient safety at the point of care.

In this paper, we explore how front-line providers and managers categorize different types of errors, adverse events and near misses (collectively referred to here as patient safety events, or PSEs) with a focus on the kinds of events they feel are valuable for learning and improving patient safety. By *learning*, we refer to the processes of identifying PSEs, analyzing their causes and taking corrective action to reduce the reoccurrence

of similar events (Sasou and Reason 1999). We have chosen to examine how front-line providers and managers categorize this broad group of PSEs for several reasons. First, organizations that intend to learn from PSEs will be confronted with a large number of opportunities, given past studies reporting on the incidence of adverse events among hospitalized patients (e.g., Baker et al. 2004; Kohn et al. 1999; Wilson et al. 1995).

Accordingly, a classification scheme that is meaningful to front-line providers and managers can help organizations make judicious choices concerning which events to study. Second, self-reports tend to identify serious events with bad outcomes, while other events go unrecognized. When events are captured and corrected before harm occurs, care providers often fail to remember the potential system vulnerability, and important learning opportunities are lost (Greenberg 2009). By focusing upon those events that maximize learning opportunities, an organization may be able to identify local strategies that will increase capture rates and correct the kind of minor events that have the potential to escalate and cause serious harm.

Third, there is little agreement in the literature concerning which types of PSEs should be the focus for learning, change and

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improvement (Layde et al. 2002; McNutt et al. 2002). We were unable to locate literature about the way front-line providers or managers categorize types of PSEs and which type(s) are believed to present valuable learning opportunities – with one recent exception. In an article by Tamuz et al. (2004), investigators examined pharmacists' behaviours and reported that incentives and professional hierarchies influence PSE definitions and classification schemes. They found that PSEs are sometimes “defined away,” thereby reducing opportunities for learning and patient safety improvement. Accordingly, provider and organization definitions and classifications of errors and adverse events are important because responses to these events (i.e., whether we are able to learn and improve) will depend initially on how these groups capture, define and classify them.

Finally, studies have highlighted the lack of universally accepted definitions and understanding of *error* (Dovey et al. 2002; Elder et al. 2006; Grober and Bohnen 2005; Weingart 2005) and related terminology in patient safety (Chang et al. 2005). Other studies have examined error identification skills of healthcare providers, including physicians (Caplan et al. 1991; Elder et al. 2006; Espin et al. 2006), pre-hospital and other emergency medicine providers (Hobgood et al. 2006a, 2006b), nurses (Cook et al. 2004) and pharmacists (Etchegaray et al. 2005), and have found that these groups are inconsistent in their identification of errors. This lack of a common language and inconsistency in error identification hinders systematic reporting of PSEs (Chang et al. 2005; Cook et al. 2004). It also limits the potential to learn from these events since the

possibility for learning is directly related to how potentially dangerous events are understood, interpreted and categorized (Sutcliffe 2004). To maximize their utility, it is essential that PSE categorization schemes strongly reflect the perspectives of those who provide care (Tamuz et al. 2004).

Methods

The Office of Research Ethics at York University approved this study.

Focus groups of front-line providers, managers and patient safety officers were used to gain insight into how people in healthcare organizations categorize different types of PSEs in the context of bringing about learning from these events. A typology of PSEs was developed from the focus group data. The typology and a short questionnaire were fed back to focus group participants for member checking and validation.

Participants

Five hospitals in the province of Ontario were purposefully selected in an effort to ensure representation from towns and cities, northern and southern communities and teaching, community and small hospitals. To ensure respondents in each focus group naturally and comfortably interacted and functioned on a similar power gradient (Morgan 1997), two focus groups, with six to eight participants each, were conducted in each organization: one with patient safety officers and patient care managers including pharmacy managers, and the other with front-line nurses and allied health professionals. In total, there were 74 participants in 10 focus groups.

Focus Group Procedures

Focus groups followed methods outlined by Morgan (1997). The structure and content of the focus groups were also designed to provide an educational component for participants as we gathered data necessary for this study. Focus group procedures were as follows:

- Each group began with a brief presentation and engaged participants in a general discussion of definitions of errors, adverse events and near misses.
- We described different ways in which PSEs can be differentiated, such as whether or not they are preventable, how serious the outcome is, how often the event occurs, whether the event is discovered before or after it causes harm etc.
- Participants were shown written descriptions of four categories of PSEs we adapted from those used in incidence studies internationally (Baker et al. 2004; Davis et al. 2002; Schiøler et al. 2001; Vincent et al. 2001; Wilson et al. 1995) to try to reflect PSEs the literature says may be valuable for learning: (1) near misses, (2) preventable adverse events causing minimal harm but no prolonged hospitalization, (3) prevent-

able adverse events that resulted in prolonged hospitalization but no permanent harm to the patient and (4) sentinel events (events that resulted in permanent disability or death).

- Participants were asked to (1) reflect on the kinds of PSEs that would be valuable for learning following a PSE and (2) consider the extent to which they are able to think in terms of the four categories we presented that were adapted from incidence studies.

All focus groups were moderated by one of two authors (L.G. or Y.C.) or the research associate and were recorded and transcribed. Extensive field notes were also made.

Data Analysis

Three of the 10 transcripts, with all identifiers removed, were reviewed by three authors (L.G., Y.C. and J.R.) and analyzed using constant comparative methods to identify an initial list of themes (Strauss and Corbin 1998). These initial themes were then applied to the remaining transcripts by a research assistant and the two lead investigators (L.G. and Y.C.). NVivo 5 (QSR International, Victoria, Australia) was used to facilitate data coding and sorting. A typology of PSEs was created using a template analysis from which emerged a revised list of themes and subthemes.

Results

Four key themes emerged from the focus groups in response to our two questions regarding the utility of an incidence-style typology and the types of PSEs that organizational members felt would be valuable for learning. We describe each theme here and provide illustrative quotations from the focus groups in the sidebar.

Theme One: Incidence Categories Are Problematic for Those Working in the Organization

The first theme is that incidence categories are problematic for those working in the organization, particularly those at the front lines. The data suggest that a typology of PSEs based on differing degrees of harm (as is typically used in incidence studies) is not intuitively clear to staff at the front lines. In particular, staff find the categories too fine grained and restrictive and reported that events are better understood as fluid as the boundaries between the respective categories are blurred (e.g., a near miss could easily have become an event causing harm). They further point out that it is often not possible to know the final outcome of a particular event – for instance, it is difficult to know if disability resulting from an adverse event will be permanent, and it is also difficult for providers and managers to know whether an event causes prolonged hospitalization. Instead, staff tend to think in a pragmatic way that includes fewer categories of PSEs, using simple language such as major events and minor events and

Illustrative Quotations

Theme 1: Incidence categories are problematic for those working in the organization (particularly for those the front lines).

FL participant: I think one event could lead to another. You know, you look at your near miss, well it could have been a bad outcome if the medication she got was wrong ... I think some can start off one way and end up in another category ...

Moderator: Are the categories and terminology clear?

FL participant: Instead of saying "near miss" ... you'd probably just say, "Phew!" [several participants laughing]

FL participant: I might say there was a "medication error," but I would never use those words. I wouldn't really ever say, "That was a preventable adverse event." [laughter]

Moderator: If you tried to sort all various incidents or events that happened in your work week or month into one of the four buckets that we talked about, would you have trouble deciding which bucket they fall into? Would we need other categories?

FL participant: I think there's always going to be a small grey area, but they're pretty specific, the categories. I don't think we need any more.

FL participant: You might not be able to determine whether it's category three or four, the hospitalization might be prolonged, but whether or not it causes permanent disability, we might not know at that instant.

L participant: My perspective is, I don't care so much how the event is categorized. I care very much about the impact to the patient. And I would like to see a gradient as far as impact to a patient, whether there was serious injury, no injury, minor injury ... and I want to know about the "almost" as much as I want to know the ones that have actually happened because I think we can learn as much from both of them ... And we should be learning.

Theme 2: Preventable events should be focus of learning but preventability is not always clear.

L participant: The notion of what is preventable is not always clear: Where does illness or disability related to prolonged waiting fit in? Do we focus on what is preventable within the organization? ... the system? ... Patient non-compliance may be preventable and caused by healthcare management if we didn't explain things clearly.

FL participant: What about a patient who codes and dies at the start of a weeklong shift where no one knew the patient? ... Would better communication or handoff have prevented this death?

Theme 3: Near misses are an important but complex category.

FL participant: But even with the things caught early, like me pulling the Demerol out instead of morphine. You know, drawing it up, then, “Oh dear.” I caught it then, but inside my head I’m thinking, “We’ve got a problem here ‘cause that morphine looked a lot like Demerol.”

FL participant: I think when you’re standing at the drug cart ... and you’ve made an error and you’ve caught it, that’s a minor incident – nothing happened. You know ... you’re going to be careful next time whatever. But as soon as you take that needle and you’re just ready to give ... I think at that point, it becomes major.

Moderator: But how do we know between minor or major near miss?

FL participant: My heart rate!

Theme 4: There is disagreement on whether events causing severe harm or events with harm potential are most valuable for learning.

L participant: We would never expect that every single incident report that comes across our desks would require root-cause analysis. We don’t have the manpower. What we do have is ... a way of highlighting those that are more severe, have potential for more harm; those are where we focus most of our effort.

L participant: I personally think the greatest opportunities are the ones that won’t actually result in an error – the near misses that you catch just before ...

L participant: Near misses are good for learning, like a free pass.

FL participant: I think you remember. If you draw up the wrong medication – you draw up morphine instead of Demerol – that may over the years go away; but if you’ve actually injected the morphine instead, you never forget that incident because the incident ... occurred ... You actually did something to a patient that was adverse ... It doesn’t go away. It’s there as a permanent learning.”

FL refers to front-line staff focus groups; L refers to manager/leader focus groups.

differentiating between these events based on the degree of harm that occurred (or could have occurred in the case of near misses).

Theme Two: Preventable Events Should Be the Focus for Learning

Providers and managers believe “preventable” events (as opposed to non-preventable events such as a first-time allergic drug reaction) should be the focus of learning; however, they also provided numerous examples demonstrating that preventability is not always clear. Moreover, providers have some difficulty with use of the term *preventable* as it seemed to imply that the provider is somehow at fault rather than other aspects of the system being the source of the problem.

Theme Three: Near Misses Are an Important but Complex Category

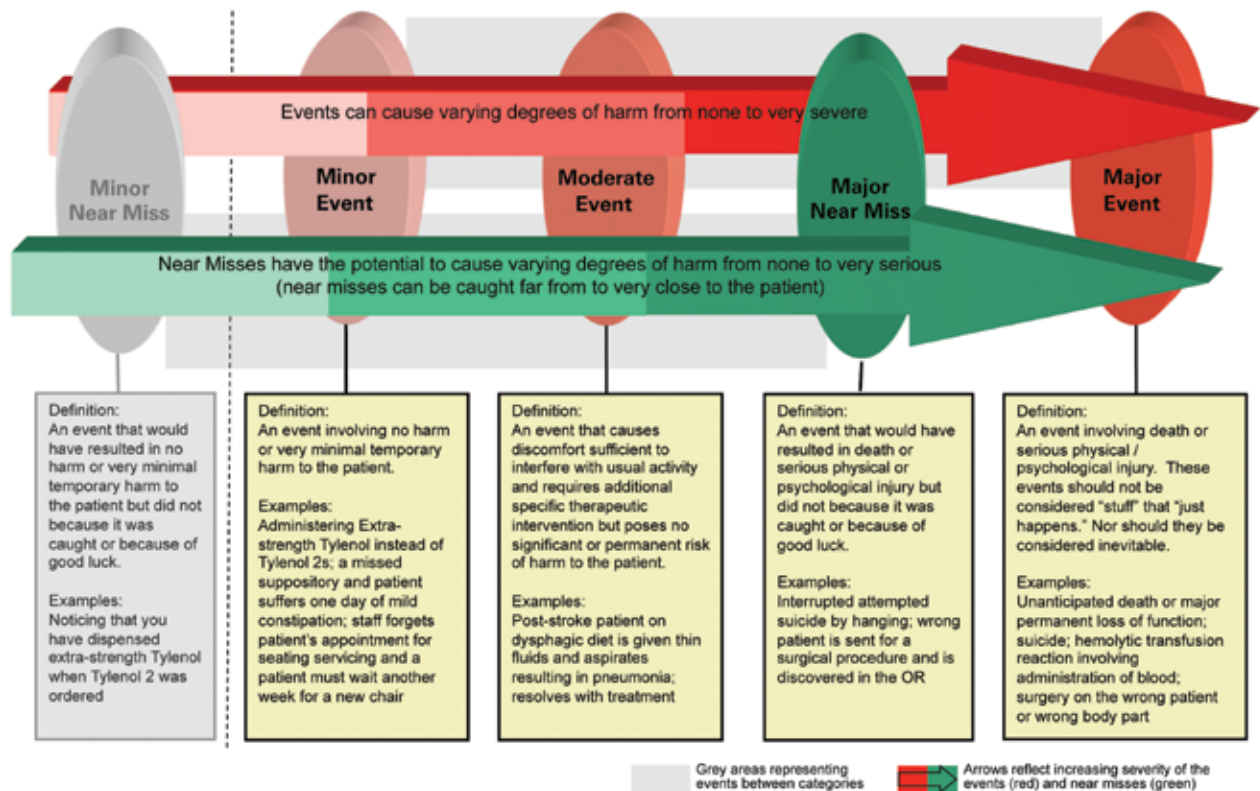
Providers and managers feel near misses are important to identify if we are to achieve learning, change and improvement, but the data suggest that the complexity inherent in identifying near misses as a category, and distinguishing between subcategories, should not be overlooked. First, participants noted that near misses often go unnoticed and unreported, and it is therefore challenging to learn from them. Respondents also made an important distinction within the near-miss category based on (1) the harm potential of the near miss and (2) the proximity (e.g., how near or far) of the near miss to the patient when it is “caught.” They describe near misses that have serious potential for harm caught either distal or proximal to the patient as being “major near misses,” and near misses that have little harm potential or those intercepted and corrected very distal to the patient as “minor near misses.” Minor near misses, they suggest, are the kind of thing people catch, say “oops” and move on.

Theme Four: There Is Disagreement on Whether Events Causing Severe Harm or Events with Harm Potential Are Most Valuable for Learning

In terms of learning opportunities, our findings suggest that there are two views about whether to focus on events that cause severe harm or near miss events with the *potential* to cause severe harm. On one hand, staff recognize that major near misses provide an important opportunity for learning in an atmosphere that is less likely to be punitive, while sentinel events that caused serious harm or death can be very difficult to get close to. On the other hand, events that cause harm to a patient seem to resonate more with staff, and for longer periods of time, thereby increasing the likelihood that some kind of learning, be it at an individual or system level, will occur.

Overall, the findings of the study suggest a typology of PSEs that (1) excludes events that are clearly non-preventable, (2) incorporates two or three categories of events ranging from minor to

Figure 1. Typology of patient safety events



major and (3) includes events that reach the patient as well as near-miss events. A typology of PSEs was developed based on these findings. Definitions and examples were added for clarity, and the typology was mailed to all 74 focus group participants, along with a short questionnaire asking about its usefulness and clarity. Forty-eight people (65%) responded to the survey. Over 90% of respondents found the categories of events very useful for practice. The typology, modified slightly to incorporate participant feedback, is shown in Figure 1.

Discussion

Understanding PSEs and how to reduce their reoccurrence requires an approach that takes into account participants' perspectives on the events (Sutcliffe 2004). The present study sought to investigate how front-line providers and their managers categorize PSEs and what types of events they see as valuable for learning and improvement. Theme one indicates that the kind of fine-grained taxonomies proposed for achieving uniformity in reporting and facilitating synthesis of reported data are too wordy and complex for the front-line nurses, allied

health professionals and patient care managers we studied. This finding is consistent with those of others, which demonstrate that the complexity of taxonomies designed to facilitate improved reporting in hospitals (Chang et al. 2005) and primary care settings (Jacobs et al. 2007; Rosser et al. 2005) may pose problems for certain audiences (Chang et al. 2005). Instead, each of the themes described suggests that a simple typology that divides errors and near misses into minor and major categories is most meaningful for everyday practice for this audience (a moderate category is added, given feedback that there needs to be something between minor events and major events with harmful outcomes). The findings also suggest that the audience distinguishes minor, moderate and major events based on the severity of harm, or harm potential in the case of near misses. This finding is consistent with several recent studies (Elder et al. 2006; Espin et al. 2006; Hobgood et al. 2005) showing that clinicians look at the severity of a negative outcome in making judgments about whether or not an error has occurred.

Theme two reveals that providers emphasize the need to focus on those events that are preventable, the difficulties of

ascertaining preventability notwithstanding (Weingart 2005). This finding is consistent with the idea that errors should be the focus of attention and learning because, by definition, they are avoidable (rather than adverse events, which may or may not be preventable). This important provider perspective is consistent with the perspective that we should focus on faulty processes of care, regardless of outcomes. These data may therefore help to inform disagreement in the literature about whether learning should focus on this type of error model (McNutt et al. 2002) or whether we should be focusing on an injury model (Layde et al. 2002), which suggests focusing on events with harmful outcomes, even if the processes that led to the harm may not be considered preventable.

Theme three speaks to the complexity of near misses and helps advance the literature by raising the question of whether all near misses are equally valuable for learning and improvement. The fact that providers see a minor near miss as an “oops” is consistent with the way some of the pharmacists that Tamuz and colleagues (2004) studied “defined away” more minor events caught prior to leaving the pharmacy through standard checking procedures. To maximize learning, we may need to find ways to minimize the extent to which minor near misses are defined away as this process causes some potentially important events to escape the attention of others (Tamuz et al. 2004). Organizations would also benefit by having some mechanism that helped identify those minor events that require more in-depth review.

Finally, theme four reflects ongoing discussion about the benefits of focusing on events that cause harm versus those near miss events that are intercepted but have notable harm potential. While near misses may, in theory, be quite valuable for learning, some evidence suggests we tend to learn more from catastrophic events (Ginsburg et al. 2007). Accordingly, organizations need to work hard to ensure that near misses gain proper attention and response from organizational members.

Conclusion

While the utility of doing so seems obvious, it is unclear whether researchers and practitioners will be able to agree on and achieve consistent usage of patient safety terminology. What is apparent from this study and others is that providers in health-care organizations do not adhere to commonly cited Institute of Medicine definitions of error in their practice but, instead, rely on other factors such as the degree of harm, rarity of the event and perceived individual responsibility in making judgments about whether a particular event constitutes an error (Elder et al. 2006). What may be most pressing at this time is finding a simple way for providers to talk about and reflect on a range of PSEs with the aim of enhancing learning, change and improvement in patient safety at the point of care. This study helps us to move in this direction by providing insight into the practi-

Staff find the categories too fine grained and restrictive and reported that events are better understood as fluid as the boundaries between the respective categories are blurred.

tioner view of various PSEs. The proposed typology shown in Figure 1 provides a simple mechanism that uses non-threatening language that organizations can use to talk about PSEs in a way that is meaningful to staff and managers.

The physician perspective requires further study, and we did not consult other key stakeholders such as patients and their families in our process. It is well recognized that patients and families, with their unique experiences with and perspective on the system, have much to contribute to PSE identification and resultant system improvement (Evans et al. 2006; Wasson et al. 2007; Weingart et al. 2005; Weissman et al. 2008). Future work involving these groups could build on our typology and enhance its usefulness. **HQ**

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