Medication errors: what hospital reports reveal about staff views

Marja Härkänen and colleagues examine a study to help nurses reduce the risk of making mistakes when administering medicines to patients

Abstract

Nurses are generally responsible for administering medication to patients and are, therefore, able to monitor or report medication errors. However, nurses can sometimes be responsible for causing errors, so it is important that they understand the consequences of these mistakes and how to prevent them. This article reports the results of a study that analysed the views of nurses, pharmacists and physicians at a Finnish university hospital on the prevention of medication errors. The findings suggest errors can be prevented by improving work environments and allowing healthcare staff, particularly nurses, to concentrate on the task at hand when dealing with medicines.

Keywords
Medication errors, patient safety, reporting

ADMINISTERING MEDICATION is one of the most common interventions in health care, but the complexity of the medication process can lead to unintended outcomes (Rozich et al 2003, McBride-Henry and Foureur 2006, Sheu et al 2008). In recent years the use of medicines has grown, and there has been an increase in new products available (Ndosi and Newell 2008). Rapid advances in technology and medicine have improved patient care, but the risk of errors has increased in this complex environment (Ndosi and Newell 2008, Sheu et al 2008).

Promoting safety in the medication process is vital because adverse events have significant consequences, such as increasing hospital admissions, prolonging hospital stays, using additional resources, increasing the amount of time staff spend away from work and lowering patient satisfaction. And medication errors can cause patients harm, the result of which can range from slight discomfort to death (Barker et al 2002, Ford et al 2006).

Nurses care for patients in hospitals around the clock and are usually responsible for administering medication, so they have an important role in detecting, reporting and preventing errors (Miller et al 2006). However, nurses also cause errors (Barker et al 2002), so it is vital that they understand and can prevent them (Wakefield et al 2005).

Information about medication errors and near misses can be used to identify risks and generate safer practice (Thomas and Panchagnula 2008). Error-reporting systems help gather data about these events (Savage et al 2005), the details of which are used in many international studies (Hicks et al 2004, Rudman et al 2005, Miller et al 2006, Pierson et al 2007, Thomas and Panchagnula 2008). However, because these studies have not analysed participants’ views on how to prevent errors, this study was designed to gather this information.

Study

The data for this retrospective register study were collected from the Kuopio University Hospital web-based error-reporting database HaiPro. Most reporters on the database are nurses, although all professionals involved in patient care can use it to report detected errors and near misses. In 2010 there were 1,617 incident reports on the database, of which 671 were connected to medication and were therefore analysed for this study.

Data analysis

The error-reporting form on HaiPro contains a free-text section in which reporters can give their views about how this type of incident could have been prevented. This qualitative information was quantified and classified into...
different categories according to content, then processed statistically using the SPSS for Windows 19.0 software program. Results were reported using frequencies and percentages, but their description incorporated direct quotes from staff about error prevention; some examples are given in Box 1.

**Results**

**Medication errors** Most of the reports (82.6 per cent) came from registered nurses, while pharmacists reported 5.4 per cent and physicians only 2.5 per cent. Most incidents related to administration (39.9 per cent) or documentation (25.5 per cent) errors, and the most common types of incidents involved wrong doses (26.0 per cent) or omissions (24.0 per cent). Table 1, page 34, shows medication error types in different phases of the medication process.

Approximately two thirds (69.2 per cent) of the incidents reached the patients, while one third were near misses. The majority of the incidents (65.7 per cent) caused no harm to patients, and only 0.3 per cent were estimated to have caused severe harm. Particular medicines were commonly linked to errors, most often psycho-pharmaceuticals or intravenous or intramuscular antibiotics.

**Box 1  Examples of staff views on preventing errors; direct quotes taken from the error reports**

- **Attention and caution** ‘More accuracy, diligence and focus on dispensing medicines. It is important to check the medicines before administering them.’

- **Common management policies and guidelines** ‘There is a guide to update the patient medication records, when a patient enters and exits the hospital. In this error situation, the instructions were not followed. The incident could have been prevented if the instructions had been followed.’

- **Flow of information** ‘The patient records information should be consulted. Entry interview has to be very careful especially with the patient’s allergies. The person who brings the patient must be familiar with the patient details; you cannot say: “I don’t know, I just came to work”.’

- **Clear lines of responsibility** ‘A patient demanding continuous medical treatment should be treated by an intravenous-licensed nurse. And one should have to focus only on those issues, not ten others at the same time.’

(Quotes translated from Finnish)

**Staff views on preventing medication errors** Staff gave different views on how medication errors have been prevented (Figure 1), but increased attention and caution (21.6 per cent) in different phases of the medication process was the most common view.

Jointly agreed management policies and guidelines were mentioned in 12.4 per cent of cases, because they were not followed or there were not any. Staff thought that such policies and guidelines were particularly important because of the obscurity of roles, tasks or responsibilities in the workplace. Employees thought that the guidelines could help clarify roles, such as whether it is the responsibility of nurses or doctors to record details of new medication in electronic records. Proposals for the development of existing activities were also mentioned. Some of the comments described situations where existing guidelines were not followed.

A new electronic medication record was introduced at Kuopio University Hospital at the end of 2009, but by 2010 users were still experiencing difficulties and lacked familiarity with the software program; for example, 7.7 per cent of reporters needed clarification about, or support with, using it.

Avoiding confusion about the medicines was described by 7 per cent of reporters as important. Their comments refer to being unsure about medicines because of similar drug names or similar packaging, as well as confusion over dispensing or administering medicines to patients.
Checking medicines is fairly routine, but 6.3 per cent of reporters said that they believed that medication checks should be increased, particularly during busy periods when mistakes are easily overlooked, and even where there is a dose distribution system, or when pharmacists are working on the wards.

Reporters said that double checking and checking medication with patients was important for error prevention, while 4.6 per cent suggested that increasing the verbal and written flow of information between colleagues, different professional groups, patients and different wards was important.

Having enough nurses on a shift in relation to the number of patients was described as a factor in error prevention in 3.9 per cent of reports, and reporters suggested that lack of staff makes people rush and pay less attention to their tasks, which increases the risk of errors. Another 3.9 per cent of reports noted that clarity of written information about prescribing, ordering and documenting should prevent errors.

Freedom to concentrate on the task at hand during the medication process was described as important by 3.4 per cent of reporters, while the busyness of working environments, large numbers of disruptions and rushing were all described as risk factors.

Clear lines of responsibility during the medication process was perceived as important by 2.4 per cent of respondents, who also noted that clear division of responsibilities could prevent duplication and reduce the risk that no one completes a task. Clear lines of responsibility were also associated with clarity about who should take charge of patient medication.

Insufficient induction of new employees and lack of skills were described as risks in 2.4 per cent of reports. Better training to carry out tasks is needed.
by all professionals involved in medication, but some reporters said that often there was too little
time to induct new staff.
Finally, verification of the right patients
during the medication process was described
by 1.3 per cent of reporters as important for
preventing errors, alongside ensuring that patients’
identities are highlighted before administration and
during documentation.

Discussion

Limitations and strengths There are limitations
to this study. First, 22.4 per cent of reporters
made no suggestions about how errors could
have been prevented.
Second, research suggests that only a minority
of errors are ever noticed (Evans et al 2006, van den
Bent et al 2007) and only some of these are reported
(Wakefield et al 2005, Evans et al 2006, McBride-
Henry and Foureur 2006, Griffin and Resar 2009).

Therefore, it is assumed that the data represent only
a few of the errors that occurred.
Generalisation of the results is challenging
because the data were reported and collected in one
hospital and in one country, so issues related to
culture could affect the results.
However, the study’s strength, is that two experts,
the principal investigator and the hospital
pharmacist, worked together to analyse the material,
al all categorisation of the errors was agreed on, and a
consensus reached. In addition, the study material
was a one-year sample of the medication errors.

Discussion of results The aim of the study was to
analyse staff views, recorded on incident reports,
on preventing medication errors. Most reporters
were nurses and their views were considered
valuable because of their ability to oversee the
whole medication process. Physicians reported only
one in 40 errors, which supports previous studies

<table>
<thead>
<tr>
<th>Preparing</th>
<th>Delivering</th>
<th>Storing</th>
<th>Ordering</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>2.7 (18)</td>
</tr>
<tr>
<td>16.7 (3)</td>
<td>25.0 (3)</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>10.6 (71)</td>
</tr>
<tr>
<td>16.7 (3)</td>
<td>0 –</td>
<td>0 –</td>
<td>12.5 (1)</td>
<td>25.5 (1)</td>
<td>26.0 (174)</td>
</tr>
<tr>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>12.5 (1)</td>
<td>0 –</td>
<td>1.0 (7)</td>
</tr>
<tr>
<td>0 –</td>
<td>8.3 (1)</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>6.1 (41)</td>
</tr>
<tr>
<td>5.6 (1)</td>
<td>8.3 (1)</td>
<td>0 –</td>
<td>0 –</td>
<td>25.0 (1)</td>
<td>24.0 (161)</td>
</tr>
<tr>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>5.2 (35)</td>
</tr>
<tr>
<td>11.1 (2)</td>
<td>41.7 (5)</td>
<td>0 –</td>
<td>37.5 (3)</td>
<td>0 –</td>
<td>8.8 (59)</td>
</tr>
<tr>
<td>11.1 (2)</td>
<td>8.3 (1)</td>
<td>100 (9)</td>
<td>0 –</td>
<td>50.0 (2)</td>
<td>9.6 (64)</td>
</tr>
<tr>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>3.1 (21)</td>
</tr>
<tr>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0 –</td>
<td>0.6 (4)</td>
</tr>
<tr>
<td>38.9 (7)</td>
<td>8.3 (1)</td>
<td>0 –</td>
<td>37.5 (3)</td>
<td>0 –</td>
<td>2.2 (15)</td>
</tr>
<tr>
<td>100 (18)</td>
<td>100 (12)</td>
<td>100 (9)</td>
<td>100 (8)</td>
<td>100 (8)</td>
<td>100 (670)</td>
</tr>
</tbody>
</table>
This study suggests that medication errors can be reduced or prevented by enabling staff to focus their attention on the task that show their low participation in error reporting (Evans et al 2006, Miller et al 2006). Reported incidents caused few consequences for patients and only 0.3 per cent were thought to cause severe harm, which again supports previous error-reporting studies. For example, Miller et al (2006) analysed 1,010 reported errors, of which none were serious and most of which related to administration errors; similar results were found by Hicks et al (2004). In addition, wrong dose and omission, the most common types of error, were also found in other studies (Hicks et al 2004, Rudman et al 2005, Pierson et al 2007, Sheu et al 2008).

Staff views on error prevention mostly concerned paying increased attention and exercising caution during different phases of the medication process by everyone involved. Significantly, reporters thought that they or others had acted negligently, rather than blaming the system or environment for errors, despite the fact that, in recent years, the focus of patient safety has moved away from blaming individuals. This study found that staff often thought they had to work more competently.

There are many environmental and system issues that affect the medication process; for example, rushing, interruptions and disruptions make it difficult to concentrate and administer treatments to patients safely (Wakefield et al 2005, Sheu et al 2008, Brady et al 2009, Palese et al 2009, Hewitt 2010).

Many reporters highlighted insufficient staff resources as a risk and said that more staff and more peaceful environments were required to reduce errors. Interruptions during nurses’ drug rounds are notably common. For example, Biron et al (2009) observed 6.3 work interruptions per hour during medication administration, while Palese et al (2009) noted one interruption every third drug given.

Research suggests that an important way to avoid this problem is to create a calm working atmosphere. Anthony et al (2010), for example, found that after implementation of a ‘no interruption zone’ system during medication preparation, interruptions decreased by 40.9 per cent.

Verifying and checking drugs are vital for error prevention, particularly at the administration stage, when there are many opportunities for mistakes while staff ensure the ‘right dose of the right drug is given to the right patient by the right route at the right time’ (Wulf et al 2011); distraction might partly explain why these ‘five rights’ are not observed. Furthermore, heavy workloads, long shifts and fatigue can affect nurses’ focus and might explain why the ‘five rights’ are no longer a part of the safe medication administration routine (Hewitt 2010).

Reporters offered opinions on how medication processes might be changed. For example, some said drugs with similar sounding names or similar packaging caused problems and these issues have been reported previously (Wakefield et al 2005, Brady et al 2009, Hewitt 2010). The pharmaceutical industry should investigate the potential for eliminating confusion over drug names and packaging.

Hospitals should ensure the appropriate and safe storage of medicines, and make sure staff are aware of the potential risk to patients if there is confusion over drugs or packaging.

Lack of thorough patient identification is another risk factor during the medication process; even if staff are familiar with patients, they must check identities to ensure the right patients receive the right care (World Health Organization (WHO) 2007). The Institute for Safe Medication Practices (2011) recommends that at least two staff check patients’ identities during medication administration.

Verbal and written information are risk factors, and various studies have highlighted problems with transfer of information, and with obscurity and inconsistency of medication information.

Tjia et al (2009), for example, found medication discrepancies when patients were moved between institutions or care settings in almost three out of four admissions, which accounted for one in five medications prescribed on admission. Meanwhile, Cornish et al (2005) found that 53.6 per cent of patients had at least one medication discrepancy at the time of hospital admission, and Vira et al (2006) found that 60 per cent of patients before and after admission had at least one unintended variance between prescription and pre-admission medication use, as well as with inpatient medication at discharge.

Medication variances during hospital admission and discharge are common and clinically important. Effective communication is crucial to patient safety (WHO 2008), and these findings emphasise the importance of improving communication and co-operation.
Conclusion
Improving safety in the medication process is important for reducing the risk of harm to patients and for increasing the quality of health care. Voluntary web-based error-reporting systems are important tools for gathering information on medication errors because they enable healthcare staff to offer ideas about how to prevent mistakes.

This study suggests that medication errors can be reduced or prevented by enabling staff to focus attention on the tasks at hand and by improving work environments. Verifying and checking actions, fluent communication and staff co-operation are also vital. Hospital systems should encourage safe medication practice by providing the necessary resources, relating to workforce, education, induction and the provision of interruption-free zones.

In many countries, legislation and guidelines are in place to promote patient safety, and these should be implemented, evaluated and followed in practice.

References