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Communication in critical care : measuring and monitoring quality of care to improve patient safety

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Chapter 1

General introduction and Outline of the Thesis

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General Introduction and outline of the thesis

Introduction

In the last decades, in- and outpatient healthcare systems have become more effective but have also become more complex with greater use of new technologies, medicines and a multitude of interventions. ¹ As a result of this, patients who are hospitalized are particularly vulnerable to suffer incidents or Adverse Events (AE) during their hospitalization. ²⁻⁵ Twenty-seven to 50% of these events were judged as preventable. ⁵ Adverse events can eventually result in life threatening events such as cardiac arrest, unplanned admission ICU and unexpected death. If these events occur, patient safety and quality of healthcare of the patient will be affected.

Patient safety and Quality of care

During the last twenty years there has been an increasing interest to monitor and improve patient safety and to determine to which extent harm is preventable. ^{3,6}

Patient safety can be defined as “a discipline in the health care sector that applies safety science methods with the goal of achieving a trustworthy system of health care delivery. Patient safety is also an attribute of health care systems; it minimizes the occurrence and impact of, and maximizes recovery from, adverse events”. ⁷

Patient safety can be measured and improved by assessing the quality of care. Quality of health care is defined by the Institute of Medicine as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”. ⁸ This definition of quality of health care made it appear that quality was just a listing of quality indicators, which expressed the standards in care. ⁹ More recently, the Institute of Medicine focuses on conceptual components of quality instead of on measured indicators. Accordingly, “high quality” of care comprises care that is safe, effective, patient centered, timely, efficient and equitable. ¹⁰

Donabedian developed a model to assess the quality of care. In this model, structure (how care is organized) and process (what we do) both influence patient outcomes and the results achieved. ^{11,12} Another aspect, context, also called ‘safety culture’ has been specifically added for patient safety models to evaluate the context in which care is delivered. ¹³ (Figure 1.)

To improve healthcare quality and safety these four domains (structure, process, outcome and culture) should be considered in conjunction with the best available clinical evidence. Quality improvement activities identify and address gaps in the four domains, between the four domains and between knowledge and practice. ¹⁴

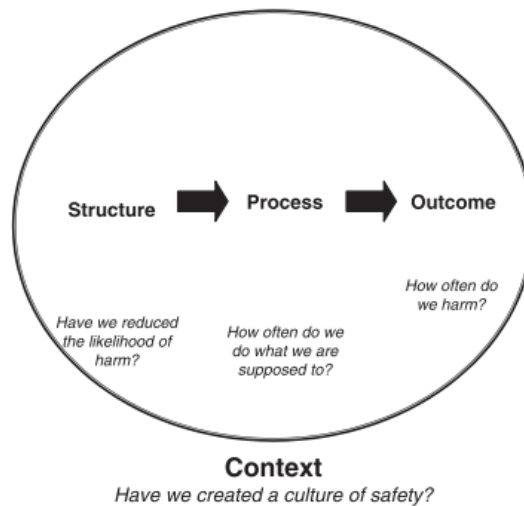


Figure 1 adapted from Pronovost ¹³

How to optimize and improve quality of care for critically ill patients on wards or the ICU?

Quality of care and patient safety can be improved in hospitals by focusing on the following aspects of care: safety, effectiveness, patient centeredness, timeliness, efficiency, and equitability. This will eventually result in meeting better patient needs and higher patient satisfaction. ¹⁰

In hospital wards this can be done by standardization of the processes of care. This means that guidelines and clinical protocols should be introduced which promote best practices and optimize the standardization of care in patients who have clear presenting symptoms or acute diagnoses. ¹⁵ Besides standardization of care, early recognition and treatment of the deteriorating patient is also important. Rapid response systems aim to improve the safety of hospital-ward patients whose condition is deteriorating. This system is based on identification of patients at risk (calling criteria and method of activation), and rapid intervention by the response team. ¹⁶ Another aspect to improve the patient safety on the ward is the improvement of communication between physicians and nurses. Nurses and physicians often communicate over the phone and this form of communication is prone to errors. ¹⁷ Communication is reported as an important contributing factor to the occurrence of serious adverse events. Effective communication increased when the nurse used a standardized method to communicate with the physician, i.e. the Situation-background-assessment-recommendation (SBAR) tool. ¹⁸

When the patient becomes more critically ill and the effect of the therapy instituted on the hospital ward is not sufficient, the patient will be admitted to the intensive care unit (ICU) for extensive care. Patients in the ICU are particularly vulnerable due to their

illness but also because of the multitude of invasive diagnostic and therapeutic interventions and the use of numerous potent drugs. Furthermore, the ICU is a complex, high technology health care system and a high risk environment with intensive use of new technologies, medicines and equipment, a diverse range of physicians and nurses, many hand-over moments and many communication layers. ¹ Thus, ICU patients are very prone to incidents and errors which eventually can result in serious adverse events and complications. ¹⁹

In the ICU several strategies can be implemented to enhance and improve patient safety. One of the strategies is the use of a daily goal form to improve clear communication. From studies by different disciplines such as aviation and chemical industries, but also in health care, it is well established that communication is to date still the most important single factor contributing to the occurrence of near-misses, incidents and complications. Particularly in the ICU effective communication between the ICU physicians and nurses is imperative. Both have to understand the goals of care which include the tasks to be performed and the care and communication plan. It was shown that by the use of a daily goal form, the communication between ICU physicians and nurses became more effective and nurses understood better the goals of care for the day. ²⁰

However, although the use of a daily goal form can improve the communication, humans are fallible and incidents and errors are to be expected. An incident reporting system that identifies hazardous systems is another strategy that can give insight in causative factors related to the occurrence of incidents and errors in the ICU. ²¹ By reporting these incidents in an incident reporting system, the incidence of incidents becomes visible. By analyzing incidents the causative patterns and conditions under which nurses and physicians work will be uncovered and improvement strategies can be installed. ^{22,23} Most importantly, potential strategies should be checked for their actual effectiveness in clinical practice, thereby closing the PDCA (Plan-Do-Check-Act) cycle, since this is the ultimate tool to actually change clinical practice and improve quality. ²⁴⁻²⁶

With respect to prevent errors, reduce incidents and improve quality, checklists are an important tool to increase patient safety, by improving communication and structuring care. ^{27,28} Checklists are particular helpful in the complex processes on the ICU. A checklist highlights the essential criteria and will help the user not to forget important items but it also achieves standardization of the process and enhances objectivity and reproducibility. ^{29,30}

Another important aspect of quality of health care is patient and family satisfaction. Although maybe a proxy, patient and family satisfaction affect timely, efficient and patient-centered health care, and they even affect patient outcome. Thus, it is essential

to monitor and evaluate delivered care. Because often critically ill patients on the ICU cannot make decisions themselves, family members are involved in the care process as surrogate decision-makers. Assessing the satisfaction of the family with the delivered care to ICU patients can be measured by using family satisfaction questionnaires. In itself family satisfaction is an aspect of quality of care, but these questionnaires can also give a reliable impression of the way the care was given by the ICU professionals to their relative. Thus, asking family is a way to assess the quality of delivered care.

Aim and outline of the thesis

The aim of the work summarized in this thesis is to assess which tools are available to measure and monitor quality of care in critically ill patients and to study the effect of implementing some of these tools to increase patient safety and quality of care.

Chapter 2 describes the COMET study rationale and design. In this before-after study the Modified Early Warning Score (MEWS) and the Situation-Background-Assessment-Recommendation (SBAR) communication tool was implemented followed by the introduction of the Rapid Response Team (RRT). The primary outcome was the incidence of the composite endpoint including cardiopulmonary arrest, unplanned ICU admission or death. **Chapter 3** presents the results of the pragmatic before-after study of the introduction of the RRS in Dutch hospitals. A generalized linear mixed model (GLMM) was used to compare the primary outcome and the individual endpoints between the before phase and the RRT phase. **Chapter 4** describes the effect of a RRT on the mortality of patients on the wards that did not have a limitation of medical treatment (LOMT) order and the effect of a RRT on the change of these LOMT orders over time. **Chapter 5** reports the level of satisfaction of nurses and physicians with the introduction of the Rapid Response System in Dutch hospitals. **Chapter 6** presents the influence of the introduction of daily goals form in the ICU on ICU-length of stay. **Chapter 7** reports the development of an intra-hospital transport checklist by using a comprehensive method with the aim to increase patient safety during transportation of ICU patients to the radiology department. **Chapter 8** describes a review of the medical literature of the available incident and error reporting systems (IRSs) in the adult ICU and the extent to which the IRSs comply with the PDCA cycle. **Chapter 9** reports on a review of the medical literature of the available questionnaires to measure family satisfaction on the ICU and provides an overview of the quality of these questionnaires by evaluating their psychometric properties. A general discussion and summaries in English and Dutch are provided in the last two chapters (**Chapter 10 and 11**).

References

1. Leape LL. Error in medicine. *JAMA* 1994;272:1851-57.
2. Brennan TA, Leape LL, Laird NM, et al. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. *N Engl J Med* 1991;324:370-376.
3. Kohn LT, Corrigan J, Donaldson MS. *To err is human: building a safer health system*. 6 ed., Natl Academy Pr, 2000.
4. Leape LL, Brennan TA, Laird N, et al. The nature of adverse events in hospitalized patients. Results of the Harvard Medical Practice Study II. *N Engl J Med* 1991;324:377-84.
5. Zegers M, de Bruijne MC, Wagner C, et al. Adverse events and potentially preventable deaths in Dutch hospitals: results of a retrospective patient record review study. *Qual Saf Health Care* 2009;18:297-302.
6. Hayward RA, Hofer TP. Estimating hospital deaths due to medical errors: preventability is in the eye of the reviewer. *JAMA* 2001;286:415-20.
7. Emanuel L, Berwick D, Conway J, et al. *What Exactly Is Patient Safety?* 2008.
8. Institute of Medicine. *Medicare: A strategy for quality Assurance: Volume 1*. Washington DC, National Academy Press, 1990.
9. Mitchell PH. *Defining Patient Safety and Quality Care*. 2008.
10. Institute of Medicine. *Crossing the Quality Chasm: a new health system for the 21st century*. Washington, DC, National Academy Press, 2001.
11. Donabedian A. Evaluating the quality of medical care. *Milbank Mem Fund Q* 1966;44:Suppl-206.
12. Donabedian A. The quality of care. How can it be assessed? *JAMA* 1988;260:1743-48.
13. Pronovost P, Holzmueller CG, Needham DM, et al. How will we know patients are safer? An organization-wide approach to measuring and improving safety. *Crit Care Med* 2006;34:1988-95.
14. Hewson-Conroy KM, Elliott D, Burrell AR. Quality and safety in intensive care-A means to an end is critical. *Aust Crit Care* 2010;23:109-29.
15. Pannick S, Beveridge I, Wachter RM, Sevdalis N. Improving the quality and safety of care on the medical ward: A review and synthesis of the evidence base. *Eur J Intern Med* 2014;25:874-87.
16. Jones DA, DeVita MA, Bellomo R. Rapid-response teams. *N Engl J Med* 2011;365:139-46.
17. Rabol LI, Andersen ML, Ostergaard D, Bjorn B, Lilja B, Mogensen T. Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals. *BMJ Qual Saf* 2011;20:268-74.
18. Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf* 2006;32:167-75.
19. Pronovost PJ, Thompson DA, Holzmueller CG, Lubomski LH, Morlock LL. Defining and measuring patient safety. *Crit Care Clin* 2005;21:1-19, vii.
20. Pronovost P, Berenholtz S, Dorman T, Lipsett PA, Simmonds T, Haraden C. Improving communication in the ICU using daily goals. *J Crit Care* 2003;18:71-75.
21. Wu AW, Pronovost P, Morlock L. ICU incident reporting systems. *J Crit Care* 2002;17:86-94.
22. Reason J. Human error: models and management. *BMJ* 2000;320:768-70.
23. Mahajan RP. Critical incident reporting and learning. *Br J Anaesth* 2010;105:69-75.
24. Moen R, Norman C. *Evolution of the PDCA Cycle*. 2006.
25. Singh VK. *PDCA Cycle: A quality Approach*. *Utthan J Manag Sci* 2013;1:89-96.
26. Taylor MJ, McNicholas C, Nicolay C, Darzi A, Bell D, Reed JE. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *BMJ Qual Saf* 2014;23:290-298.
27. de Vries EN, Prins HA, Crolla RM, et al. Effect of a comprehensive surgical safety system on patient outcomes. *N Engl J Med* 2010;363:1928-37.

28. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 2009;360:491-99.
29. Hales B, Terblanche M, Fowler R, Sibbald W. Development of medical checklists for improved quality of patient care. *Int J Qual Health Care* 2008;20:22-30.
30. Hales BM, Pronovost PJ. The checklist-a tool for error management and performance improvement. *J Crit Care* 2006;21:231-35.

