

# Master thesis

# “Safety rounds”

A study of the utilization of patient safety rounds  
and the crucial aspects for implementation in  
University Hospital Maastricht

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## **Abstract**

*Problem:* In the Netherlands, patient safety is becoming one of the most pressing health care challenges. Each year, between 1,500 and 6,000 people die because of medical mistakes. 75% of these deaths could have been prevented. A way to improve patient safety in health care is the use of safety rounds. The topic of this master thesis is the utilization of safety rounds and how they can be implemented at the Elective Intensive Care (EICU) department in University Hospital Maastricht.

*Aim:* The aim of this study was to develop a suitable safety round for increasing patient safety at the EICU of the University Hospital Maastricht. Also a research was carried out of how patient safety rounds can be implemented in University Hospital Maastricht.

*Methods:* The research is performed by using qualitative methods. Knowledge is collected through a literature study, interviews and observations. The literature study has been carried out in preparation for the research to map the state of art concerning patient safety and the use of safety rounds. This has led to develop the aim, the problem statement, the sub questions and the theoretical framework. Interviews with external experts generated information on safety especially on the existing safety rounds and the positive and negative aspects of these rounds. All interviews were open-ended interviews. They were semi-structured because a couple of questions were drawn up to give the interviews some direction.

*Results:* This research has started with an investigation of best practices of safety rounds and has led to the development of a blueprint of a safety round for the EICU in University Hospital Maastricht. The safety round is a tool for the detection of risks concerning safety at the department and in particular patient safety. The checklist that the Atrium MC uses in that hospital for the safety rounds is selected as a basis for the safety round for the EICU.

*Conclusions:* The utilization of safety rounds is a way for risk detection concerning particularly patient safety. With help of a risk identification matrix a score is generated that determines which risk needs the highest priority. The use of safety rounds is also a low-cost intervention. Future research has to prove if the safety round contributes effectively to a reduction in the number of risks. The next step will be the refining of the safety round and the implementation of the safety round on the EICU. This research started the implementation process by selecting the strategies to implement the use of safety rounds at the EICU.

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# 1. Introduction

This introduction describes what has been studied for this master thesis and how the research was carried out. It includes the subject, background and objectives of the study, as well as the problem statement and research questions.

## *1.1 Description of the problem and topic*

Despite large efforts to care and cure patients, there are incidents in health care by which patients are unintentionally damaged. Patient safety means that the patient has no chance to get unintentionally damaged when he gets care in, or by, a care institution (IGZ, 2009).

Patient safety is a serious global public health issue. Estimates show that in developed countries as many as one in 10 patients is harmed while receiving hospital care (WHO, 2009). In developing countries, the probability of patients being harmed in hospitals is higher than in the industrialized nations. The risk of health care-associated infection in some developing countries is as much as 20 times higher than in already developed countries.

In recent years, countries have increasingly recognized the importance of improving patient safety. In 2002, WHO Member States agreed on a World Health Assembly resolution on patient safety (WHO, 2009).

A way to improve patient safety in health care is the use of safety rounds (Darrell, Campbell & Thompson, 2007). The topic of this master thesis is the utilization of safety rounds and how they can be implemented in University Hospital Maastricht.

### *1.1.1 Patient safety in the Netherlands*

Patient safety is becoming one of the most pressing health care challenges in the Netherlands. Each year, between 1,500 and 6,000 people die because of medical mistakes. 75% of these deaths could have been prevented (Ministry of VWS, 2009).

A few years ago there was a lack of knowledge about the level of safety in health care in the Netherlands. Care institutions appeared to have systems that insufficiently guarantee that (possible) unsafe situations are identified on time and that the signals are picked up also. Therefore the Ministry of Health, Welfare and Sport (VWS) in the Netherlands decided that patient safety is a topic to be addressed with special attention (Ministry of VWS, 2009). The ambition is to gradually halve the number of medical mistakes made each year over the period of five years, started in 2008. The general program objective is 'to contribute to the

acquisition, dissemination and application of the necessary knowledge, insights and experience and to encourage stakeholders both collectively and individually to work towards this goal' (ZonMw, 2009).

### *1.1.2 Better Faster Program*

Since 2002 various programs have been started in order to improve patient safety in health care. One of them is the Better Faster ('Sneller Beter') Program.

The Better Faster Program was launched in 2003 and ended in 2008 as an initiative from the Ministry of Health, Welfare and Sport and the Dutch Hospital Association (NVZ). The aim was to help parties in the field to improve their performance, starting with hospital and primary health care - where there is plenty of room for improvement. The Better Faster Program comprised three core activities:

- benchmark hospitals and primary health care
- formulate and implement indicators for safer and better care
- a quality, innovation and efficiency program

At the end of 2004, Better Faster advised that all hospitals in 2008 should work with a safety management system (Veiligheids Management Systeem, VMS) (Willems, 2004). All parties concerned endorsed this point of view.

### *1.1.3 Safety management*

With a safety management system it is possible to improve and control quality and safety of care in hospitals in a systematic way.

In 2005 the project 'Safety management, construction of safety in care-delivery' ('Veiligheidsmanagement, bouwen aan veiligheid in de zorg') started, an initiative of the Order of Medical Specialists, the NVZ association of hospitals and the Rural Expert centre Nursing and Care. Within the project *safety management*, they worked out concrete products for elements of the safety management system (van Ginkel & Mercx, 2007).

The basic elements of the VMS were identified in co-operation with ten pilot hospitals. Experiences and conclusions were circulated widely, in order to support other hospitals with the implementation of their VMS.

Not only the Managing Board of Directors of a hospital carries the responsibility for safety management, also medical, nursing and other allied professionals are responsible for the safety of care. All professionals should report incidents and work transparently according to clear guidelines and protocols. An open and pro-active culture is needed in the departments

to work on safe care. The changing of behavior of professionals to look at another way to their own work needs (special) attention for working at safety (NVZ, 2006).

Culture is in the project *safety management* an important element of safety in health care. In the frame of the culture element, there are offered culture interventions at the pilot hospitals to make safety negotiable and to realize a culture change in the hospital (NVZ, 2006). Important objective of this project was to have the basic elements of a VMS available in January 2007. Hospitals that have not implemented a VMS in 2008 will be expelled from the association of hospitals (Ministry of VWS, 2009).

#### *1.1.4 Patient safety rounds*

Patient safety requires a change of mentality with respect to implementation, management and control. Organizations need to be willing to learn from their mistakes. A way to do that is the use of patient safety rounds.

Safety rounds are a new aspect of risk management in hospitals. Patient safety rounds were established at the University of Michigan Medical Center to improve patient safety by opening a new line of communication between the chief of staff and frontline caregivers (Darrell, Campbell & Thompson, 2007). Safety rounds are a way to assess and control safety and quality issues. Different variants are possible by which the (safety) issues can differ, such as patient safety and health, quality, employees' safety, fire safety and security. For integral risk management it is important to consider the effects of safety rounds on (patient) safety and health and also on the welfare of employees including security and fire safety, and ICT safety (behavior). An example of ICT safety is the use of (personal) entry codes and logging off at a terminal after use. Awareness and awareness change is an important part, respectively target of safety rounds.

According to Darrell, Campbell, & Thompson (2007) the goals of patient safety rounds are to improve patient safety by creating a culture of safety. Specific goals of patient safety rounds are for example to ensure that organizational leadership is kept knowledgeable about patient safety issues and involved in the necessary changes that address these identified issues, furthermore to bridge the gap between leadership and care providers and fuel culture for change related to patient safety.

Other goals of patient safety rounds are to identify opportunities for improving safety, education of employees about patient safety and establishing a framework for safety-based, rapid cycle improvements.

## *1.2 Aim of the research project*

This study is a study at the utilization of safety rounds and the aim is to develop a suitable safety round for increasing patient safety at the Elective Intensive Care Unit (EICU) in University Hospital Maastricht (azM), situated in the south of the Netherlands. The aim is to find out how safety rounds contribute to the safety culture in a hospital and how they can contribute to the safety culture in the azM specifically. Also a research will be carried out of how patient safety rounds can be implemented in the azM.

## *1.3 Description of the research setting (institution/organization, target group)*

The focus of the research project was on the Elective Intensive Care Unit (EICU) in the University Hospital Maastricht (azM). The EICU is a cardio surgical care unit and is located at F3 in the azM. In the hospital are also two general intensive care units (D3 and E3) and a medium intensive care unit (C3) located. All the intensive care units that are included at the medical Intervention Center (E3, D3 and F3) are located in one organizational unit and are controlled by an intensivist.

The EICU differs from other intensive care units because here the personnel is specialized in cardio surgery. Most of the time patients stay at the EICU for just one day and then they are transferred to another department. The most occurring cases are; coronary artery bypass grafting (CABG), ventricular septal rupture (VSR) and aortic valve replacement (AVR). During a day at the EICU there are three shifts; the day shift, the evening shift and the night shift. Respectively from 7.00am till 15.30pm, 15.00pm till 23.00pm and 22.30pm till 7.30am. During a day shift, seven to eight nurses are working and in the evening and at night there work five to six nurses. In the weekends there are only four nurses in charge, because then there are no operations scheduled. Briefings and debriefings about a patient take place in half an hour when the nurses from the starting shift are already at the department. They give details about how the patient is doing, what medications they have given and what care is needed.

At the EICU there are nine beds, eight 'normal' beds and one bed in an isolation room, which is a separate room from the rest of the department. This room is used when patients have, for example, a contagious virus and must be separated from the other patients to prevent contamination.

## *1.4 Problem statement*

What can be a suitable safety round for increasing patient safety in the azM?

### *1.5 Research questions*

The main research question of this study is: *How can the utilization of patient safety rounds contribute to the safety culture in a hospital and how can they be implemented at the EICU in the azM?*

To answer the main research question, knowledge must be gained about safety rounds and their utilization. Then a suitable safety round can be created that can be implemented at the EICU in the azM. Following this, the next sub-questions can be formulated:

- 1. What are patient safety rounds?*
- 2. How are patient safety rounds used in other hospitals/companies?*
- 3. What are the advantages en disadvantages of patient safety rounds?*
- 4. What is the best way to give form to the concept of safety rounds, and to implement patient safety rounds in the azM?*

The first sub-question is important, because information is needed about safety rounds and their utilization to get more acquainted with the topic. This sub-question will mainly be answered in the theoretical framework. The second sub-question is important, because insights in the utilization of safety rounds in other hospitals and companies can be very useful for creating a safety round for the EICU in the azM. The different positive and negative aspects of that safety rounds can be taken into account, when creating a suitable safety round for the EICU in the azM. This also explains the formulation of sub-question three. Knowledge about the positive and negative aspects or the advantages and disadvantages of safety rounds is acquired for creating the most suitable safety round.

The last sub-question, about the best way to give form to the concept of safety rounds for implementing them at the EICU in the azM, is important because then a safety round can be created that is most suitable for the utilization at that department.

## **2. Theoretical considerations**

This study started with a literature study to gain knowledge in the field of patient safety and more explicit, a tool to increase that safety, safety rounds. Very soon it became clear that a patient safety round is a very new phenomenon in healthcare, where not many information is published about.

Some articles were found which describe the interpretation of different health care organizations on patient safety rounds, but there are still little results available of the effectiveness of the safety rounds. Also little information was found about safety rounds on intensive care units. The articles mentioned also different names for safety rounds. They are called (executive) walk rounds, walkaround or operational rounds. In the first paragraph some examples of the utilization of patient safety rounds are described.

Furthermore, the influence of Crew Resource Management has been analyzed because it is supposed that this strategy offers useful solutions to reduce errors and increase safety of patients. Also some implementation theories are described, because a good theoretical framework is required for successful implementation of patient safety rounds.

### *2.1 Safety rounds*

Many healthcare organizations have implemented patient safety initiatives aimed at creating a safer healthcare environment. One of those initiatives is the utilization of patient safety rounds. Safety rounds have become a widely used method used to promote an improved safety culture. Patient safety rounds were established at the University of Michigan Medical Center to improve patient safety by opening a new line of communication between the chief of staff and frontline caregivers (Darrell, Campbell & Thompson, 2007). According to Darrell, Campbell & Thompson (2007) patient safety rounds are biweekly, hour long meetings between the chief of staff and care givers on individual patient care units.

Such safety rounds are now carried out in at least several hundred medical centers within the United States (Donnelly, Dickerson, Gessner, Moskovitz & Hutchinson, 2008). Safety rounds typically consist of hospital executives visiting patient care areas and discussing safety issues with frontline employees. Most have been targeted at nursing units. It is believed that safety rounds have a positive effect on patient safety through multiple effects, including the demonstration of executive and institutional commitment to safety, the use of frontline employees' knowledge to identify areas for potential improvement, and improved attitudes about safety and an improved safety culture.

Now two exemplary cases of the utilization of patient safety rounds will follow.

### Case 1

Donnelly, et al. (2008) began with operational rounds at the Department of Radiology in Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio in January 2007. Operational rounds is a process by which radiology leadership visits with the area managers, frontline technologists, and other employees in specific imaging divisions. The goals of operational rounds include a demonstration of radiology leadership's commitment to safety, an improved safety culture and performance, an emphasis on behavioral expectations and concepts taught during error prevention training, and the identification of areas of improvement on the basis of the knowledge of frontline workers. A culture of speaking out in circumstances of uncertainty, the evaluation of systems, and avoiding individual blame for unintended human error is stressed.

Although operational rounds were born out of the safety initiative, the focus of the group is not limited to safety. Although all meetings begin with examining current safety concerns and having safety as the highest priority, discussion of issues related to improvement in quality of care, patient and family satisfaction, and operational efficiency are also encouraged. This wider focus is why they elected to call the process “operational” rather than “safety” rounds. The meetings are 45 minutes to 1 hour in length. Each division has been visited on at least 2 occasions. After going through several cycles of visits, it has been decided to visit each division twice annually. They feel that this timing is optimal, because the frequency of visits is balanced with the amount of time needed to implement action plans, evaluate interventions, and resolve issues. In addition, the frequency allows enough time to pass to potentially accumulate issues worthy of discussion. Notes are taken for each operational round. The notes are organized in tables that include columns for a description of the issues, persons responsible for a plan of action, actions planned and taken, and the date the issues are resolved. The notes are posted within the administrative section of the department's intranet portal and are available for review by all radiology employees. Notes are updated as action plans are executed and issues resolved. Employees can check on updates for issues in their respective areas, and technologist managers can evaluate issues in other divisions to see if these same issues may also need intervention in their areas.

### Case 2

At North Carolina Children's Hospital (NCCH) at University of North Carolina Hospitals (UNCH), patient safety rounds were established in the fall of 2005 (Yee, Edwards, Dixon & Gleason, 2009). The NCCH introduced patient safety leadership walk rounds as a

tactic of improving effectiveness, understanding, feedback, communication, and satisfaction related to the ability to provide high-quality patient care. The anticipated outcomes for NCCCH were compliance with regulatory and professional standards, strategic planning, and promoting and improving patient safety through interdisciplinary collaboration. Rounds are held weekly and involve all members of the healthcare team. Senior leadership actively participates and helps staff seek out solutions for the identified issues. The safety rounds are created by the patient safety officer for UNCH who created a format and set up a schedule in which the leadership team would do rounds on 2 units once a month. The goal was for frontline staff to have an opportunity to talk to the leadership team about any system issues that may impact patient safety. During the rounds, the staff was asked questions to stimulate discussion and provide examples of patient safety concerns. Within the first year of operation, 191 issues were identified, of which 58% were resolved.

## *2.2 Total Quality Management*

Working according integral quality management in the Netherlands has become a trend and the azM also works according this approach.

With the use of integral quality management (Total Quality Management) the focus lies at the total (mostly complex) processes in care-delivery and includes all aspects of care. TQM is a set of management practices throughout the organization, geared to ensure that the organization consistently meets or exceeds customer requirements. TQM places a strong focus on process measurement and controls as means of continuous improvement (Free Management Library, 2009).

## *2.3 International awareness*

In 2002, the World Health Assembly adopted a resolution urging member states and the World Health Organization (WHO) to pay the closest possible attention to the problem of patient safety. On 27 October 2004, the WHO launched the World Alliance for Patient Safety to raise awareness and political commitment to improve the safety of care and to facilitate the development of patient safety policies and practices in all WHO member states (WHO, 2009). Each year, the Alliance delivers a number of programs covering systemic and technical aspects to improve patient safety around the world.

At the EU Patient Safety Summit in 2005, the World Alliance for Patient Safety launched the new Draft Guidelines for Adverse Event Reporting and Learning Systems. The guidelines are available worldwide to facilitate the development of new and improved reporting systems for patient safety (WHO, 2005).

## *2.4 Crew Resource Management*

Crew Resource Management (CRM) has been widely used to improve the operation of flight crews. CRM training originated from a NASA workshop in 1979 that focused on improving air safety. The NASA research found that the primary cause of the majority of aviation accidents was human error, and that the most important problems were failures of interpersonal communication, leadership, and decision making in the cockpit (Pizzi, Goldfarb & Nash, n.d.). Crew Resource Management was first applied to healthcare in Basel, Switzerland, in 1994. There are several applications well-known in health care. For example in operating room environments by adapting a team performance model and the MedTeams behavior-based teamwork system what aims to adapt research in team performance and training from military helicopter aviation to emergency medicine (Pizzi et al., n.d.).

The goal of CRM is to organize a group of individuals to think and act as a team with the common goal of safety and to improve decision-making within dynamic environments such as aviation and healthcare (Taylor, 2007). Error reduction and increased patient safety continue to be the focus of teamwork-based training programs (McConaughy, 2008). Berwick (2002) says about the aim of CRM, that it has to improve the quality of care by means of intervening at the organizational level. According to the Chain of Effect model this level is also known as “level C” and it means the functioning of the organizations that house or otherwise should support microsystems (Berwick, 2002). Table 1 shows the changes in diabetes care processes following implementation of crew resource management.

Table 1. Changes in diabetes care processes following implementation of crew resource management.

Pre-CRM	Post-CRM
Diabetes care protocol:	Diabetes care checklist:
No defined work steps	Defined work steps
No assigned responsibilities	Assigned tasks and responsibilities
No visible patient treatment targets	Visible patient treatment targets
Different APNs used different processes	One standardized process
Competing tasks during APN visit	Role redefinition
	Work redistribution
	Clear expectations
Omissions of care	Checklist
	Situational awareness
Fragmented care	Briefing to prepare the day's work
	Checklist
	Crosschecks
Missing or poor communication	Communication strategy:
	Checklist
	Daily briefing
	"I am concerned..."
Complexity of training	Transparent simple training
	Checklist with visible cues

APN = advanced practice nurse; CRM = crew resource management.

### 2.5 Implementation theories

A theory is required for successful implementation of safety rounds. Such theory should not only identify the most important barriers in the process of change, but it should also be focused on a level of implementation. Over more it should be based on scientific information. Grol et al. (2005) makes a distinction and categorizes change implementation theories into three major levels: the individual professional level, the social interaction and

context level and the organizational and economic context level. Each level can be choosing the best fitting change theory. Although the complexity of implementing changes in patient care cannot be explained easily from a single perspective and in some situations there is some overlap between the different theories (Grol et al., 2005). That is the reason why in this paragraph three theories get a central role, namely: the theory of planned behavior (Ajzen, 1991), the stage of readiness to change model (Prochaska, 1997), and the theory of Rogers (1983).

**The theory of planned behavior** (Ajzen, 1991) suggests that behavior of professionals is influenced by their individual intentions to perform a specific behavior, and these intentions are determined by perceived behavioral control, by perceived subjective norms and by attitudes towards the behavior. Applying this theory into the practice could mean that the attitude concerning a specific behavior is determined by the expected outcomes of this behavior and the positive or negative appraisal of these outcomes (Grol et al., 2005). For instance, personnel's attitude towards participation in process of implementation or adherence towards new protocol of the safety round as behavior could be determined by opinion that new process would increase patient safety or that it is not/worth the extra effort. Perceived social norms are influenced by the norms seen in others and importance attached to these norms (Ajzen, 1991). Before actual implementation, it is important to choose the right strategy of process positioning and introduction. This should consider positioning within both individual and professional levels. Since safety rounds are not currently implemented at other departments, this initiative could be positioned as leading, innovative and scientific-based. Implementers themselves could be positioned and introduced as frontier implementers that do a perspective and highly important task. At the same time, it is important to create a concrete plan that relate to "when", "what", "how" and "where" the change will be performed (Gollwitzer & Oettingen, 1998).

Another theory that can be applied to the safety round implementation is **the stage of readiness to change model** (Prochaska, 1997). According to this model, there are several phases in the motivation to change: pre-contemplation, contemplation, preparation, action, maintenance, and completion. These stages differ in terms of motivation and readiness to change routines in the near future and participate in the implementation process. Analysis of stakeholders could possibly identify participants that would be in all six stages. In pre-contemplation and contemplation stage, the focus should be on local opinion leaders. Individual instructions, conferences and workshops, together with small discussion groups will help to involve participants in change process. In preparation and action stage,

computerized systems and reminder systems can be used to support interventions. Records about results of assessment of the safety round could be stored electronically. However, it will be important to keep motivation on both maintenance and completion phases to prevent from relapse to previous habits and routines, and to keep using the safety round to increase patient safety.

The last theory that will be described is **the theory of Rogers** (1983). Rogers identified different target groups: innovators, early adopters, early majority, late majority, and laggards. According to this theory, innovators represent the small segment of those who are focused on new ideas and information. In this project, this group is represented by implementers, which introduce safety rounds at the department. Future implementation in other departments should focus primarily on this cohort of employees, as they could become the group of initial supporters and promoters of implementation in the future. Next group is the early adopters. This active group includes personnel with high status within the target group and a reference groups for innovators. In this project, this group includes the chief nurse and head of the department. Early adopters have close contacts with the early majority group. The latter are influenced by the early adaptors. In this project, this group is represented by medical personnel who work at the department on daily basis. However, analysis also identified two other groups of individuals that are reluctant to innovations. The late majority group - is a group of people with skeptical attitude - and those who are not particularly sensitive to information. Finally, the laggards are a group who resist the change and implementation. Identification of these groups within the individual level can help prevent possible problems and failures in the future while implementing safety rounds at other departments.

### **3. Methods**

This study design outlines the type of design, research methods, and the data collection techniques that are used for the research. First, a literature study was performed to gain more knowledge about patient safety and the use of patient safety rounds. The research is a qualitative, descriptive research. It describes different best practices and the way to develop a new safety round and how it can be implemented.

#### *3.1 Research focus*

This study focuses on the Elective Intensive Care Unit (EICU) at the University Hospital Maastricht (azM). The EICU is a cardio surgical care unit. This department functioned as pilot department for the study. For getting more background information about the EICU, an observation took place of the nurses during four shifts, two shifts during the day and two shifts in the evening. After these days there was more knowledge about the processes at the department which were used as a basis for further research at the development of safety rounds for the EICU.

#### *3.2 Data collection*

The master thesis contains a study of best practices from the literature, the Maastricht clinic in Maastricht, DSM in Geleen and the Atrium MC in Heerlen, all situated in the Netherlands. Also the supervisor of the internship in the azM, Dr. Ir. N.W.S. van der Hoeff and his colleague J. Hoofs are interviewed to get more information about the foreseen use of safety rounds and the current safety culture in the azM. Dr. Ir. N.W.S. van der Hoeff gave also advice during work meetings/consultations.

The interviews were both retrospective as prospective. Before the interviews, questions were formulated to give some structure to the interviews. In that way, the type of the interviews that is chosen for this study is a semi-structured interview. The internal interviews were focused to gain knowledge about the organization and current quality projects. The external interviews at DSM, the Maastricht Clinic and Atrium MC lead to a gain of knowledge about how safety rounds are used in the Netherlands, and they lead to a theoretical background to complete the theoretical framework of this study.

There has been searched in different sources to the following keywords: patient safety, (patient) safety rounds, (executive) walk rounds, operational rounds, risk analysis (methods), safety (management) system, medical errors, quality assurance and quality improvement. The

Dutch equivalents of these keywords were also used. The consulted sources for literature are Medline, Embase, the catalogue of Maastricht University and the Scholar version of Google.

### 3.3 Research questions

The following table shows which research methods are used to answer the different research questions. The main research question is: *How can the utilization of patient safety rounds contribute to the safety culture in a hospital and how can they be implemented at the EICU in the azM?*

Sub-questions are:

1. *What are patient safety rounds?*
2. *How are patient safety rounds utilized in other hospitals/companies?*
3. *What are the advantages en disadvantages of patient safety rounds?*
4. *How can patient safety rounds contribute to the quality and safety of care at the EICU in the azM?*
5. *What is the best way to give form to the concept of safety rounds, and to implement patient safety rounds in the azM?*

Table 2. Overview of data collection techniques per research question.

<b>Research Questions</b>	<b>Data collection</b>	<b>Research methods</b>
Main research question	All research results	All research results are analyzed and compared to answer the main research question.
Sub question 1	Literature study, interviews	Literature and interviews are analyzed to get a clear idea of (patient) safety rounds.
Sub question 2	Literature study, interviews	Literature and interviews are analyzed to get insight in the (dis)advantages of patient safety rounds.
Sub question 3	Literature study, interviews	Interviews are held at different hospitals/companies and best practices from the literature will be analyzed to see how safety rounds are used elsewhere.
Sub question 4	Interviews, observation at EICU	Interviews are held with different people in the azM and information is also gathered by observation at the EICU to get an idea of the culture at this department.
Sub question 5	Interviews, literature	The different interviews that are held are used to answer this sub question and also literature about implementation is used.

### *3.4 Validity*

For every research it is important to analyze the extent of validity of the research. Validity gives understanding in the extent of which the research results can lead till a valid conclusion (Maso & Smaling, 1998). Maso and Smaling (1998) describe validity as: the quality of the 'fit' between the studied events and the symbols (words and numbers) that these events represent. Validity is dependant from the absence of distortions in the research results. There are different kinds of validity. There is the content validity and the internal and external validity.

In this study, safety rounds are studied with help of information from different data resources (data triangulation). The consulted data resources are the literature study, observations and the interviews.

The internal validity of this study is stimulated because notes were made during the interviews, to prevent bias by a selective memory. Also some information on paper was given by some interviewees. That information supported the interview or gave references to search for more information (referential adequacy materials).

Because of the time that was available, it was only possible to visit a limited amount of organizations which are already working with safety rounds. Therefore the collected data that was analyzed was also limited. It would be better to get information of more organizations in other parts of the Netherlands to get a better external validity. In this study there is also purpose sampling, because the EICU is selected because it is a high technologic department where safety has an important role.

## 4. Results

During the process of the study some results were achieved. The master thesis project started with gathering background information about the EICU and about safety rounds through a literature study. The literature study has led to a gain in knowledge about patient safety and patient safety rounds. In chapter 2 a paragraph was dedicated to information about patient safety rounds from the literature and also some example cases were addressed. That was already an answer to the first sub question; what are patient safety rounds?

To answer the other sub questions, the most important information was gathered by interviews and observations at the Atrium medical center in Heerlen, Maastric Clinic in Maastricht and at DSM in Geleen, which are already working with safety rounds. The next paragraphs will show the results that were achieved per sub question.

### *4.1 How are patient safety rounds used in other hospitals/companies?*

This paragraph is an answer to the sub question about the utilization of safety rounds in other hospitals/companies. First some insight is given in the steps that are taken in this study to do the interviews and after that it will show reports which were made of the interviews with the external experts. The reports include an introduction of the hospital/company and what safety means for them and other interesting points of the interviews.

#### *4.1.1 Interviews*

This paragraph will give insight in the different steps that are taken in this study to do some interviews with different experts at different hospitals and an industrial company. Items that will be elucidated are: the interviewed persons, the kind of interviews and the interviews themselves.

The interview in the Maastric Clinic in Maastricht was with Petra Reijnders. She is a patient safety manager in the Maastric Clinic. At DSM there was a meeting with Jo Claessen (plantmanager) and Ger Ristenpalt (operator from the 'meetkamer'). The interview in Atrium MC in Heerlen was with Chrétien Haenen, the quality manager at the Department of Research and Innovation with working experiences at Philips and DSM.

The interviews were both retrospective as prospective. The interviewed persons told first what they had accomplished in the field of patient safety. About the safety rounds they told how they were created and how they are used at the moment. Because safety rounds in hospitals are implemented for just a short time, it was not possible to give clear definitions of

the outcomes yet. They told in a prospective way about the expected outcomes and the things that can possibly change about the safety round. It was the purpose to consult some experts about their experiences with safety rounds, so that a safety round for the EICU in the azM could be developed.

The next paragraphs contain reports with an introduction of the concerning hospitals and company, the important parts of the interview and at the end a short summary of interesting points for the safety round for the EICU in the azM.

#### *4.1.2 Maastric Clinic*

Maastricht Radiation Oncology (MAASTRO) is the new name of the Limburg Radiotherapeutic Institute, founded in 1977 in Heerlen. Their purpose is to treat cancer patients in Central and South Limburg using a form of treatment known as radiation therapy or radiotherapy. The Maastric Clinic employs approximately 225 members (Maastric, 2009).

Patient safety is one of their overriding concerns. Hospital treatment involves certain risks and Maastric wishes to reduce these risks. They used a model taken from the aviation and petrochemicals industry to develop its own risk and safety system that is unique in the Dutch healthcare system. They guarantee that system by assigning it a fixed place in their organizational structure. In doing so, they hope to set an example of how hospitals can reduce the risk of incidents and human error.

Since January 2008 the government obligated hospitals the implementation of a validated safety management system (Ministry of VWS, 2009). Since June 2008 the Maastric Clinic is the first (and still only) hospital in the Netherlands which has implemented a validated safety management system. Therefore they got the first safety certificate from minister Ab Klink of Health, Welfare and Sport. Lloyd's, an independent external certification- institution, has determined that Maastric Clinic satisfies all the requirements for getting the certificate. It can be said that the Maastric Clinic is therefore one of the leading hospitals in good patient safety care in the Netherlands. In this way it can be very interesting for other hospitals to look at the way they create good patient safety.

In the Maastric Clinic it is very important that people work there in a structural and systematic safe way. It is a high technological environment that can be risk full. Moreover, a vulnerable target group is treated here, namely patients with cancer. The safety management system in the Maastric Clinic provides a contribution at this safety.

Within the Maastric Clinic processes are being analyzed prospectively (beforehand) and retrospectively (afterwards) to improve the patient safety (see figure 1). For prospective

analyses they use the so-called SAFER-technique. SAFER stands for Scenario Analyse van Faalwijzen Effecten en Risico's and is the Dutch name for Healthcare Failure Mode and Effect Analyses (HFMEA). The reports commission takes advantage of the PRISMA-model for retrospective analyses.

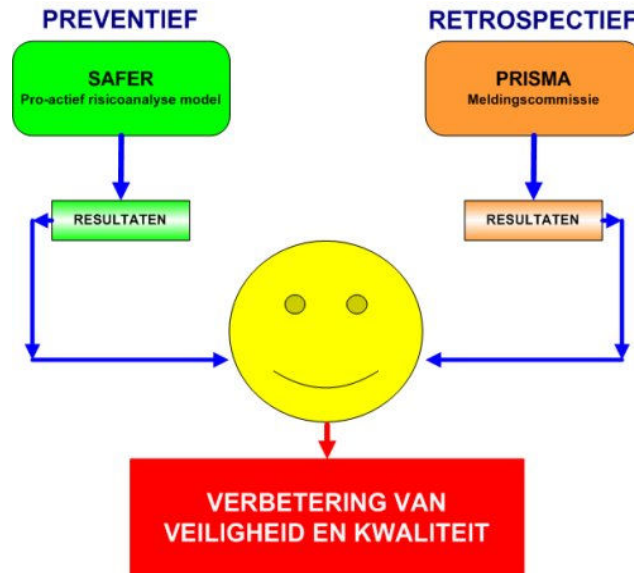


Figure 1. Prospective and retrospective risk analyses in the Maastro Clinic

HFMEA is a technique that is directed on the assessing of potential risks. HFMEA indicates demonstrable causes and consequences before they appear, by making an estimation of the chance compactness. HFMEA is a group activity of relevant experts that uses a cause-consequence structure to go brainstorming through a certain process on possible risks, failure modes and causes, and finally to define actions.

PRISMA stands for the Prevention and Recovery Information System for Monitoring and Analysis. Through a more profound analysis of causes arises a better understanding in possible incidents, both qualitative and quantitative. Also a complete and objective understanding is given in organizational, technical and human basis causes. Employees become actively involved at the analysis of incidents. This increases the understanding in the incidents and at the same time the awareness grows at employees towards the daily risks. PRISMA makes it possible (through means of a classification system) to make conclusions from a whole collection of incidents, instead of from a single case separately. The relation between a particular basis cause and the additional countermeasure is based on a theory and not on a presumption. PRISMA takes the examined incidents very clear and briefly together and shows the connection between the context variables and causes.

The organization can continuously be aware of the extent in which they can control the already known risks. With help of the system, feedback of the information can be given to the management and the rest of the organization. In this way PRISMA can bring a positive culture change regarding the reporting and the accepting of mistakes. With help of the system, continuous improvements can be reached regarding the quality of many aspects in the organization. Analyses are made periodical and give feedback to the organization.

In 2004 the function of manager patient safety was introduced in the Maastric Clinic. In 2007, there was an organizational expansion with a staff member patient safety and a patient safety team. These staff members combined are responsible for the further development of the risk and safety policies within Maastric Clinic, by which instruments are introduced to improve the patient safety in the Maastric Clinic. Within the patient safety team all disciplines are represented that are concerned at the patient process (radio therapist-oncologist, clinical physicist, radiotherapeutic laboratory worker and administrative support). The patient safety team comes together every month.

In May 2009 they started with their first safety round, which they call 'Veiligheidsronde'. Within the organization they already spoken about the use of safety rounds in an earlier phase, but then they decided that they were not ready for it yet. Their first safety round was conducted in a multidisciplinary environment, namely the 'planningsomgeving'. It is planned to conduct a safety round every half year/twice a year. The safety round has 4 pillars; the environment, the processes, cooperation and the equipment. The patient safety team also makes analyses of the reports made in the PRISMA system, and they also speak about different topics that need interest in the safety round. That forms the input for the safety round. They also make decisions about which employees of the concerning division and other staff are chosen to perform the safety round. They try to choose employees that do not have a certain barrier to talk about safety issues.

The safety round is an open conversation with the manager/director and the 'chosen' employees of the concerning division. The safety round takes about a half day. The work document of the safety round looks very similar with the HFMEA-method. The different issues that come up during the conversation are listed below each other and after that you can write the seriousness (how severe is it when it goes wrong?) and the frequency (how many times does it appear?). In this way the document shows the importance of the different issues and the ones who really need action.

Summary of interesting points:

- The safety round in the Maastricht Clinic is an open conversation with the manager/director and the 'chosen' employees of the concerning division.
- The safety round includes 4 pillars; environment, processes, cooperation and equipment.
- The work document is diverted from the HFMEA-method.
- The safety round takes place every half year, during a half day.
- The safety round has to result in a list of the most important issues.

#### 4.1.3 DSM N.V.

The interview at Royal DSM N.V. was with Jo Claessen (plantmanager of the business group DSM Engineering Plastics) and Ger Ristenpalt (operator from the 'meetkamer').

Background information about DSM N.V. can be found in appendix II.

DSM Engineering Plastics in Geleen has a strong focus on Safety, Health & Environment (SHE). In 2007 they won the DSM SHE Award and in 2008 they were the runner-up. SHE focuses on all areas of health and safety. Important elements for the SHE Award are: excellent management of SHE behavior, learning from all incidents, the control of the exposure of employees to hazardous chemicals, the initiatives on health and all the other initiatives that have been taken to improve the reputation, including communication with main stakeholders. The DSM SHE Award is given annually to the one DSM site worldwide that best demonstrates outstanding safety, health and environmental practices. Given the size and scope of DSM's global operation – with more than 200 sites competing for this award each year – this is a prestigious honor.

In the DSM Engineering Plastics plant, while there is work in progress, every two days a safety round is performed. Then the management of the plant checks with help of a checklist if there are any unsafe situations and observes peoples actions. Furthermore they check if the prescriptions and agreements, that are present on the working permits, are lived up to. The managers also make a little talk with the employees about safety, to try to make them aware about working safely. In every safety round, there is looked for new safety issues which are listed in the special safety plan. For their own employees and subcontractors who work for DSM there are monthly toolbox meetings. This is a meeting where safety and working safe play central roles. They discuss possible accident statistics and the current situation. In-house emergency personnel will introduce themselves, so everyone knows where to go to in case of emergency.

DSM is actively concerned to avoid accidents on location. And when something still happened, a procedure will immediately be activated. Hereby recommendations are made to avoid similar accidents in the future. The effect of this is that employees are always aware of necessity to act safe. It will eventually lead to a safe feeling on the location.

Summary of interesting points:

- The safety rounds take place approximately every 2 days.
- The safety round is a procedure using checklists.
- The safety rounds stimulate the safety awareness of employees.

#### *4.1.4 Atrium MC*

Atrium MC is one of the largest public hospitals in the Netherlands. They have three different locations (from where they operate). Patient care is done in an innovative way and continuously they are working at improvements for the (high) quality of care.

For more than 100 years the Atrium MC is an acknowledged educational hospital. The training/education of medical specialists and nurses and the stimulation of applied scientific research play a central role.

In 2003, Atrium MC started developing the SPAR-management system. After a pilot, Atrium MC implemented the VIM and SPAR-management system to report incidents in 2007. The reports are analyzed and then actions are started to prevent that the incident can repeat. All possible incidents, large and small, even when they not led till damage yet, can be reported. The more there is reported, the more can be prevented and improved. All nursing- and attending divisions and outpatient clinics are in.

‘Vrijwillig en Veilig Incident Melden’ (Voluntary and Safely incident reporting) is a decentral, easy accessible and blame-free report system for incidents. The goal is to find causes of incidents and finally to improve them. The reporter is totally protected (with)in the system. The goal of VIM is not pointing out offenders, but to improve processes. The SPAR-management system is a riskmanagementsystem. SPAR stands for ‘Structureel PATient Risico’ which means Structural PATient Risk. This is a permanent present risk which always can lead to new incidents. In the SPAR-management system incidents are reported.

Furthermore, structural patient risks which underlie incidents are registered and the actions of improvement which follow are registered and managed. This means it is checked if the actions of improvement actually occur and lead to the desired effects, namely the reduction or elimination of the risks. The SPAR-management system is also the name of the software

application. This application includes three different functions: reporting of incidents, registration of risks and monitoring if the actions of improvement really take place to manage those risks.

In 2009 Atrium MC started with safety rounds. They are diverted from the safety rounds at DSM. The division manager conducts the safety round by walking around the department. Also a second observer goes along and it is possible for a third person to join. For example, it can be interesting for another division manager to join the safety round, because then he/she can have a look at how things are going at another department. This can contribute for both departments at new insights in the field of patient safety. In this way they can possibly learn from the positive and negative aspects of a department and therefore can improve maybe their own department. The safety rounds are conducted every month and when a department desires fewer times, it can be done four times a year. The patient safety manager is responsible for the safety rounds in Atrium MC. With the safety rounds, Atrium MC wants to stimulate the involvement of employees at patient safety in a playful manner. The results of the safety round can be demonstrated at the department so that everyone can see where they stand according to patient safety and which aspects still need improvements.

In the Netherlands there is the 'Nederlands Normalisatie-instituut' NEN, a national standardization institute. Standardization strives for efficient, safe, healthy and durable products and processes. In a clever way several interests become united with each other. Recently the NEN knows the possibility to establish a new form of specifications: the 'Nederlandse Technische Afspraak' (NTA), or the Dutch Technical Event. With the introduction of these NTA, the Dutch Standardization Institute approaches the market question for fast events which are widely applicable (NEN, 2009). In an NTA, events are fixed about concerning specifications or working methods which can be used directly widely. One of the NTA norms is the NTA 8009 about safety management in hospitals. The NTA 8009 norm fits in the safety round of the Atrium MC and in this way they also meet the requirements of that norm.

Summary of interesting points:

- The safety round is a procedure using checklists which are checked by the division manager and a second/third observer.
- At Atrium MC the safety round includes now 12 subjects; hygiene, knowledge, other observations, medical dossiers, VIM and SPAR, privacy, in-house emergency and

first-aid service (BHV), working conditions (ARBO), environment, treatment rooms, medicine room and storage room.

- The safety round takes place preferably every month, for 30-60 min.
- The safety round is a method to discover all the issues that (can) occur, and the risks that are present, but no degree of frequency or seriousness.
- Safety rounds stimulate employees' involvement at patient safety in a playful manner.
- The safety rounds in Atrium MC include the NTA norm.

#### *4.2 What are the advantages en disadvantages of patient safety rounds?*

This paragraph shows shortly the results of the analyses that are made to answer the sub-question about the advantages and disadvantages of the safety rounds.

First, one of the advantages of the safety rounds in the Atrium MC is that they include a checklist, which is not difficult to fill in. The different topics are listed below each other and the person who fills it in has only to mark the boxes with yes or no. Furthermore, the checklist has a duration of only 30-60 min., only two or three persons are involved, the safety round includes the NTA norm and is also a low-cost intervention. The safety round is derived from the safety rounds used at DSM, but intended for a health care organization setting.

The safety rounds in the Maastric Clinic differ in many ways from the safety rounds in the Atrium MC. First, they are not using a checklist, but the safety round is an open conversation. Secondly, they only take place twice a year. Though, to be successful, the safety rounds require a good and open culture, because people are needed who are prepared to talk about safety issues freely. Also a very concerned management is needed to let this safety round succeed.

#### *4.3 What is the best way to give form to the concept of safety rounds, and to implement patient safety rounds in the azM?*

An analysis of the different safety rounds was the start of making a blue print for a safety round for the EICU in the azM. After the analysis with the advantages and disadvantages, a blue print for a safety round could be made for the EICU. This paragraph will go in depth about the use of a checklist which can be filled in during a safety round at the EICU in the azM. The total first draft of the safety round for the EICU can be found in attachment 1. Because the people who are going to work with it in the azM are Dutch, the safety round is also written in Dutch.

The first draft is based on the safety rounds as they use them in the Atrium MC. The table is almost the same, but there are some differences. In the columns you can still note if

the topics are okay (IO), not okay (NIO) or that it is not applicable (NVT). But furthermore the columns for comments and actions are omitted and replaced for boxes where you can fill in the seriousness and frequency and in the final box you can fill in the risk score. This only needs to be filled in when the concerning topic is not okay (NIO).

The safety round of the Atrium MC is used because the checklist is not difficult to fill in, because you only have to fill in that the topics are okay or not okay. Furthermore, it has a duration of only 30-60 min., only two or three persons are involved, the safety round includes the NTA norm and is also a low-cost intervention. The safety round is derived from the safety rounds used at DSM, but intended for a health care organization setting.

A very interesting part of the safety rounds in the Maastricht Clinic is the use of a risk identification matrix. In this way the safety round results in a list with the most important issues. Then you can see which issues need the highest priority. Therefore, the risk identification matrix of the SAFER method is attached to the checklist.

The best way to give a classification to the seriousness and the frequency of a failure mode is to discuss it in a department meeting. Then you have the head of the department, who did the safety round, together with some of the staff and you will get a more reliable opinion about the classification. Also the staff must think about the risks and discuss them with each other, and in this way you are stimulating the awareness. The scores can be calculated with help of the risk identification matrix from the SAFER method (see table 3). With help of this matrix you can give a quantitative score to the seriousness and the frequency of a certain risk. The numbers between the parentheses are the weighted risk scores.

Table 3. SAFER Risk Identification Matrix

	<i>Seriousness</i>				
		<b>Catastrophic Ca (4)</b>	<b>Great Gr (3)</b>	<b>Moderate Mo (2)</b>	<b>Small Sm (1)</b>
<i>Frequency</i>	<b>Weekly We (4)</b>	<b>Very high (16)</b>	<b>Very high (12)</b>	<b>High (8)</b>	<b>Low (4)</b>
	<b>Monthly Mo (3)</b>	<b>Very high (12)</b>	<b>High (9)</b>	<b>Low (6)</b>	<b>Very low (3)</b>
	<b>Yearly Ye (2)</b>	<b>High (8)</b>	<b>Low (6)</b>	<b>Low (4)</b>	<b>Very low (2)</b>
	<b>&lt; 1x / year (1)</b>	<b>Low (4)</b>	<b>Very low (3)</b>	<b>Very low (2)</b>	<b>Very low (1)</b>

**Categorization Seriousness**

<i>Code</i>	<i>Category</i>	<i>Definition</i>
Ca	Catastrophic	Death/serious permanent injury
Gr	Great	No serious permanent injury
Mo	Moderate	No permanent injury
Sm	Small	No injury

**Categorization Frequency**

We	Weekly
Mo	Monthly
Ye	Yearly
<Ye	Less than 1x per year

To calculate a certain risk score, the numbers of the frequency and the seriousness are multiplied with each other. For example, a risk that is in the category great and that appears monthly gets 3 times 3 points and that lead to a score of 9, which is a high risk. The boxes of the risk scores that are (very) low are colored blue and the boxes with a (very) high risk score are colored red.

In the blueprint of the safety round the topics are still the same as the ones in the safety round of the Atrium MC. These topics must be adjusted to the protocols of the azM. The concerned RVE's (Resultaat Verantwoordelijke Eenheden) must be involved and take a look at the different items included in the safety round. These items have to match with the concerned protocols. An RVE is a collection of care around a specific group of patients. The department must also be involved, because some department bound items must be formulated by the department itself. For example, the medication safety at the EICU is a critical item. A section about the medication safety can be added to this safety round. Furthermore, some details must be completed, like the frequency of performing the safety round at the department. Based on the results in the Atrium MC it would be recommended to perform a safety round every month.

## 5. Discussion, conclusions and recommendations

In this chapter the research question of this study will be answered; how can the utilization of patient safety rounds contribute to the safety culture in a hospital and how can they be implemented at the EICU in the azM?

The discussion scrutinizes the results of the study to answer this question. The course of this study will also be discussed critically. The sub-questions will be argued shortly to come to conclusions. Afterwards, some recommendations are given for further investigation and implementation of safety rounds at the EICU in the azM. In the recommendations some points will be suggested for further development and implementation of the safety round in the azM.

### 5.1 Discussion

About sub-question 1 can be said that patient safety rounds are developed as a way for integral risk management. This study searched for best practices of safety rounds. In the theoretical framework of this study some best practices of safety rounds are elucidated. There are safety rounds which are open conversations with staff members, but it is also possible to use checklists where you can check if certain items are done correctly or incorrectly. From the collected results is a safety round developed for the EICU in the azM. When it is introduced at the department it has to be a transparent tool for detecting risks in the field of patient safety, but also on other fields which the safety round includes, like welfare of employees including security and fire safety, and ICT safety (behavior). The safety round is made with help of existing best practices that exist until now. Recent developments can undermine or support the safety round. Therefore it is useful to follow these developments accurately.

For sub-question 2, different hospitals/companies were visited to find out how they use safety rounds for improving patient safety. This has led to interesting information about the use of safety round in the Netherlands. For sub-question 3, the information from the interviews is analyzed and the advantages and disadvantages are discussed. That analysis is used for the development of a blue print of a safety round for the EICU in the azM.

About sub-question 4 can be said that the safety round that is proposed for the EICU in the azM differs from the safety rounds in the theoretical framework. The safety round for the EICU is developed from a checklist as Atrium MC uses in the hospital and it is derived from the safety rounds used at DSM. Because in some interviews the necessity of prioritizing of risks appeared, is chosen to use a risk identification matrix in the safety round. But the

managers have to use their experiences and expertise and not so much the matrix in their attempt to decrease all risks that appear on the risk list.

At the checklist of the safety round the SAFER-matrix is added to the safety round. This matrix gives a quick understanding of the particular degree of the risks. A negative aspect of the use of a risk matrix is that it is a subjective instrument. It is complex to give a quantitative assessment of the hospital care.

The results of the safety round can be communicated to the members of the EICU by printing them and placing them in the coffee room or at a prominent place at the department desk. The results can also be communicated to the rest of the organization. This can be done by placing them on an intranet site of the hospital. This offers the possibility to other departments that are confronted with similar risks to learn from experiences and experts of other departments in the hospital.

Safety rounds are also stimulating safety awareness. Every time that the results of the safety rounds are discussed with the staff members during a department meeting, they must think about the seriousness and frequency of the risks and give a classification for it. When the results are published, the staff members are again confronted with the risks at their department.

Information should be divided about the measures that are taken to deal with the risks. Staff members will be more willing to collaborate when they see that actions really follow to solve the risks and that things really improve. This also results to the preservation of the safety round within the organization. Safety will also be more discussed, since the managers can appeal on the expertise of experts to ask them their opinion of how to deal with certain risks. This can be supported by showing the results of the safety rounds on the intranet. In this way the safety rounds increase the transparency about the risks and that can lead to efficient and improved processes.

About sub-question 5 can be said that a blue print of a safety round for the EICU in the azM is created after the analysis with the advantages and disadvantages. The safety round will change after the concerned RVE's (Resultaat Verantwoordelijke Eenheden) are involved and had a look at the different items included in the safety round. These items have to match with the concerned protocols. Hence, the safety round is a basic tool that is still in development and after implementation and evaluation it can be adjusted to new needs of the department.

About the implementation can be said that some strategies are selected for implementation of the safety round (see paragraph 2.5). That strategies are all interesting ways of how the safety round can be implemented at the EICU in the azM.

After implementation feedback is important. Feedback takes place during department meetings, but it can also be done during safety rounds when the person who is carrying out the safety round sees something that is incorrect. Because of this feedback, the employees see that the management takes patient safety seriously and that it leads to improvement of the patient safety. In this way the employees might be more willing to cooperate and give more attention to patient safety during their work.

About the course of this study can be said that the study is less progressed than was foreseen in the original planning. For the development of safety rounds different interviews were held with experts in the field of patient safety. This supposed a certain dependence of the agendas of this contact persons so that the time planning and design of the safety round became somewhat elongated.

During the development of the safety round the pilot department was taken into account all the time. Some staff members of the department were prepared to give an introduction about the department and to give background information about the culture and safety at the department. Also by own observations some safety risks were noticed.

## *5.2 Conclusions*

The safety round is a tool for the detection of safety risks. These risks must be registered and actions of improvement must be invented that are based on a risk strategy that the management wants to follow. The action of improvement for a certain risk must be implemented and over time it must be tested if the safety round functions as intended. Afterwards an evaluation follows of the real situation and of the developed safety round. When it is necessary, adjustments can be made towards gained experiences and new insights in the tool. The effectiveness and efficiency of the tool has to be examined.

The safety round gives the organization a procedure for risk detection. Those risks can be registered then, and in this way the azM can learn from the shortcomings in the care delivery process. Next to the detection of risks, plans need to be made on how to control these risks and how to accomplish improvements. The use of safety rounds is also a low-cost intervention. Communication about risks will be promoted with a fixed item on the agenda during a team meeting and by the possibility for managers to contact experts to develop good improvement measures.

During the study of existing safety rounds, it appeared that some safety rounds use a risk identification matrix to prioritize the risks that come up during the safety round. In fact, all the risks do need action, but some of them have a higher priority than others. That is why

employees can give a frequency and a seriousness score to the risks during a team meeting. With help of the risk matrix a score is generated that determines which risk needs the highest priority. In the proposed safety round it is aspired that the risks are expressed in quantitative units, which can be made with help of a risk matrix. Indicating the frequency and the seriousness of the risks remains a subjective process, in which the employees and the manager always need to keep in mind to deliver 'good care'.

Because the safety round during this study is not implemented yet, it is not clear if the safety round really contributes at the reducing of risks and the increasing of patient safety. This is only possible after the tool is implemented for a few months and the first information is available of the actions of improvement that are started.

### *5.3. Recommendations*

This study resulted in a few recommendations for further research at the use of safety rounds and the effective implementation of the safety round at the EICU in the azM, and finally the entire hospital. The use of safety rounds is a way to increase safety, and in particular patient safety. It must be taken into account that the safety round is based on insights gathered from currently applied safety rounds. Therefore it is useful to follow (new) initiatives and future developments which are made. These can contribute at the adjustment of the safety round then, so that the preservation of the tool is guaranteed within the organization. From the ministry of VWS there is already a stimulant present, so that hospitals have to invest in safety. Hospitals have to transform themselves to give safety an active place in the organization.

This study, with the development of a safety round, is a step in the right way to permanently control safety within the organization. Attention must also be paid at the transformation of the organization so that a safety culture is present. The hospital has to take into account the assembling of a safety policy, the organization of a safety culture, management that is actively concerned at safety management, the criticism of safety by means of inspections, the information and education of employees within the organization about safety, the stimulation of the communication and promotion of safety. In this way the safety round can be embedded in an organization that is focused on a transparent approach of the risks in the field of patient safety in particular. When these aspects do not get enough attention, then it becomes difficult in time to motivate the employees to do their best for the safety round and the tool will slowly disappear.

For the implementation of the safety round at pilot department the EICU, also some recommendations can be given. It is recommended to inform the employees of the department about the safety round and the different tasks and responsibilities, for example during a team meeting. The most important employees that have to be informed are the division manager and one or more employees that will join the safety round.

During the implementation can arise some barriers and facilitators for implementation that are not taken into account during the preparation of the implementation plan. Therefore it is recommended that after the first safety rounds took place, the safety round is evaluated and adjusted to a final version. For example, employees can be interviewed about their experiences with the safety round and that can lead to a more improved safety round.

The implementation must be focused at the realization of the safety round and the preservation of the tool in the azM. Attention must be paid to certain practical barriers, like time and money, experimenting with the tool in the first months and the motivation of employees.

Furthermore, attention must be paid to not forget the new insights, clearing the danger of preventing falling back into old habits. Also support from the management team is critical.

Another important point which still remains is that there must be a person or a department that is responsible for the continuation of the safety rounds. For example, the installation of safety staff members. Also the involvement of the concerned RVE's, which must have a look at the different topics included in the safety round, is an essential issue. Then the safety round can change to a fully integrated and effective tool for improving patient safety.

When the safety rounds are implemented for a while and running well, then the next challenge can be to look at the ways of incorporating patients and families in the rounds. That input by patients and families can add new information and perspective to the rounding process.

It is hoped that with an increased focus on safety, the organization will see a decrease in patient complications and the financial costs that are associated with a prolonged hospital stay. It is crucial to have support from all members of the healthcare team. Together, the healthcare team creates a climate of trust so that issues can be addressed freely and in a timely manner. Only then can a safety round truly work toward minimizing safety concerns and optimizing the care that is provided for patients and their families.

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## Appendix I Safety round

### Patiëntveiligheidsronde+ checklist (PVR+) VERPLEEGAFDELING

Patiëntveiligheidsronde+ afdeling X						
Datum:		B. Bezochte ruimten:		C. Betrokken personen:		
Uitgevoerd door: Paraaf:		1. patiëntenkamer	Niet in Orde (NIO)	Niet van Toepassing (NVT)	Ernst	Frequentie
1. _____		2. patiëntenkamer				
2. _____		3. Medicatieruimte				
3. _____		4. keuken				
A. Bekeken statussen (verpl. + med):		5. _____				
1. <input type="checkbox"/> 2. <input type="checkbox"/> 3. <input type="checkbox"/> 4. <input type="checkbox"/> 5. <input type="checkbox"/> 6. <input type="checkbox"/>		6. _____	In Orde (IO)			
Nr.	mbt	Te controleren item				Score
<b>I Hygiëne</b>						
1	C	<b>Nagels</b> (geen kunst-, hars- of gelnagels, kortgeknipt, schoon, nagellak in tact)				
2	C	<b>Haar</b> (schoon, lang haar bij elkaar gebonden)				
3	C	Geen <b>sieraden</b> onderarm				
4	C	<b>Handenwassen</b> (grondig met water en zeep, na toiletbezoek, snuiten neus, hoesten en niezen, voor eten en drinken, na beëindigen werkzaamheden. Goed drogen en desinfecteren met handalcohol)				
5						
6						

<b>II Kennis / Scholing</b>									
1	C	Scholing basic life support (reanimatie) < 1 jaar							
2									
3									
<b>III Overige observaties</b>									
1	C	Ziekenhuiskleeding dragen							
2	C	Zichtbaar gedragen ID-badge							
3									
4									
5									
<b>IV Voeding</b>									
1	B	THT datum op alle producten in koelkast en niet verlopen							
2	B	Bijvoeding uitgedeeld (check koelkast)							
3	B	Geen bezoek in keuken							
4									
5									
6									
<b>V Patiëntenkamer</b>									
1	B	Losstaand materiaal (stoelen, tafelblad)							
2	B	Hebben patiënten een bel binnen bereik							
3	B	Staan de bedden in de laagste stand							
4	B	Bedden/bedplaatsen in tact (bedrek, lampje, papegaai, bel)							
5	B	O2 klokken goed aangesloten							
6	A/B	Fixatie juist toegepast							









## **Appendix II Background information DSM N.V.**

Royal DSM N.V. creates innovative products and services in Life Sciences and Materials Sciences that contribute to the quality of life. DSM's products and services are used globally in a wide range of markets and applications, supporting a healthier, more sustainable and more enjoyable way of life. End markets include human and animal nutrition and health, personal care, pharmaceuticals, automotive, coatings and paint, electrical and electronics, life protection and housing. DSM employs some 23,500 people worldwide. The company is headquartered in the Netherlands, with locations on five continents.

DSM has a decentralized organizational structure built around business groups that are empowered to carry out all business functions. At the corporate level, they have a number of staff departments to support the Managing Board of Directors and business groups.

The activities of DSM are grouped into five clusters. One of them is the Performance Materials cluster and that comprises the business groups DSM Engineering Plastics, DSM Dyneema and DSM Resins. DSM Engineering Plastics is a global player in polyamides (polyamide 6, polyamide 66 and polyamide 46), polyesters (PBT, PET and TPE-E), polycarbonate (PC and PC blends) and extrudable adhesive resins. These materials are used mainly in technical components for the electrics and electronics, automotive, engineering and packaging industries. DSM is the global market leader in high-heat polyamide. DSM Engineering Plastics has production sites in Emmen and Geleen (Netherlands), Genk (Belgium), Evansville (United States), Jiangyin (China) and Pune (India).