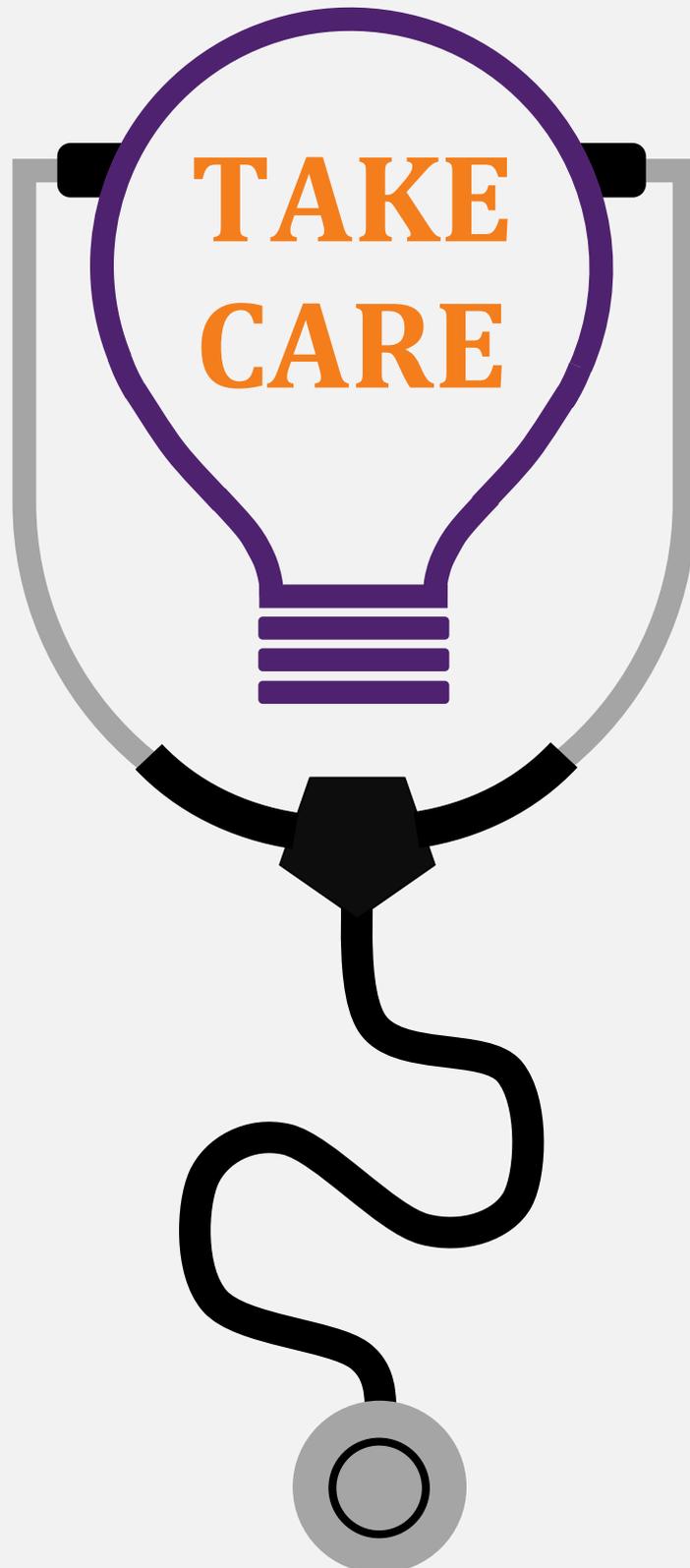


**INNOVATING AN INNOVATION: A MIX METHODS ANALYSIS  
ON THE IMPLEMENTATION OF A PEER-TO-PEER AUDIT  
INSTRUMENT AT GELRE HOSPITALS APELDOORN**



**BRAM VAN DE PAVERT  
MASTER THESIS HEALTH SCIENCES**

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SEPTEMBER 2013

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# SUMMARY

## **Innovating an innovation: a mix methods analysis on the implementation of a peer-to-peer audit instrument at Gelre Hospitals Apeldoorn**

Although most people enjoy good quality healthcare, an alarming and preventable number of adverse events have occurred in recent years. In the US, for example, 275 lives are lost from preventable medical errors every day. Even in the Netherlands, where healthcare is considered excellent, between 1482 and 2032 potentially preventable deaths have occurred in 2004. Literature shows that both safe nursing and a culture of safety are regarded important in reducing medical errors. Gelre Hospitals Apeldoorn agrees and to reduce the number of adverse events, an intervention has been developed. This intervention, called Take Care, is a peer-to-peer audit instrument measuring the nursing process by means of four different components: (1) patient records, (2) interviews with patients, (3) interviews with nurses, and (4) several observations of patient visits and meetings on the ward.

The **objective** of this study was to examine what the effect of the Take Care program is on the variables safety culture, pressure ulcers and falls. In addition, it is mapped what stimulating and obstructing factors are for the actual use of Take Care within Gelre Hospitals Apeldoorn. The **setting** was the nursing wards at Gelre Hospitals Apeldoorn.

Data was collected using a **mixed methods approach**, with both data analysis on the variables pressure ulcers and falls, and partially structured face-to-face interviews with 24 internal stakeholders, including board members, medical specialists, heads of department, healthcare coordinators and nurses. The effect of Take Care on the variable safety culture was measured using a fixed question, after which the interviewees were asked to explain the given answer.

The **results** indicated that the program did not cause a positive effect on the safety culture perceptions within the departments. Regarding pressure ulcers, there was no difference between the expected pressure ulcers prevalence in 2012 and the observed prevalence in 2011 ( $\chi^2(1, N = 1391) = 1,509, p = .2193$ ). In addition, there was no difference between the data of January 2013 with respect to the data of 2011 ( $\chi^2(1, N = 804) = 0,0053, p = .942$ ). Finally, the results also showed no significant association between several points in time and the number of falls ( $\chi^2(2, N = 6) = 1,267, p = .531$ ).

Factors that may affect the actual use of Take Care were measured on three components; the innovation, the user and the organization. Several stimulating factors were found, such as the relevance to patients, the correctness of the program and the availability of materials and amenities. Obstructing factors were also found, including the visibility of the results of Take Care, completeness and the feedback to the user.

In **conclusion**, Take Care has not reached her goals (yet) and the actual use of the program has not been ideal. A number of recommendations are provided in order to increase the support for the program and improve the implementation process.

# PREFACE

This master thesis is the result of half a year at Gelre Hospitals Apeldoorn.

I have had an enjoyable and very educational time at Gelre Hospitals. I am happy that I have had the opportunity to perform this thesis within this great, pleasant hospital. Translating a wish of the client to a concrete assignment feasible in six months sometimes gave me headaches, and although this demanded a lot of initiative and many email and conversations with supervisors from both the hospital and the university, it resulted in a research that really interested me. Besides that, I hoped, in advance, that my research could provide added value to the policy of the hospital. In my opinion, it does. Before we proceed to the actual thesis, I would like to thank a number of people who have contributed to this thesis.

My first word of thanks goes to Bert Kleinlugtenbeld for giving me the opportunity to perform my master thesis at Gelre Hospitals Apeldoorn. In addition, I would like to thank him for reading my report, and for giving remarks about it. A second word of thanks goes to Liza Heijboer, for several reasons. First, for helping me getting used to the hospital. Second, for keeping me focused and to remind me to stand up for myself. Third, for reading my report and proposals, and providing feedback.

My third word of thanks goes to Jeannette van Manen. First, for helping me with refining my research, especially in the beginning. Second, for reading my report and proposals, and giving remarks. A fourth word of thanks goes to Wim van Harten for helping me with getting direction and reading my report.

Fifth, I would like to thank the 24 respondents for participating with the interviews. Without their help, I would not have been able to write this thesis.

Last, but not least, I would like to thank the people that made my thesis period much more pleasant; Marcel and Zeppo for the nice conversations and the animal spotting while traveling to and from Apeldoorn and my parents and brother for the support during the lesser moments in the past six months. Finally, I would like to thank my girlfriend for, besides borrowing her laptop the entire period, the great amount of support.

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# INTRODUCTION

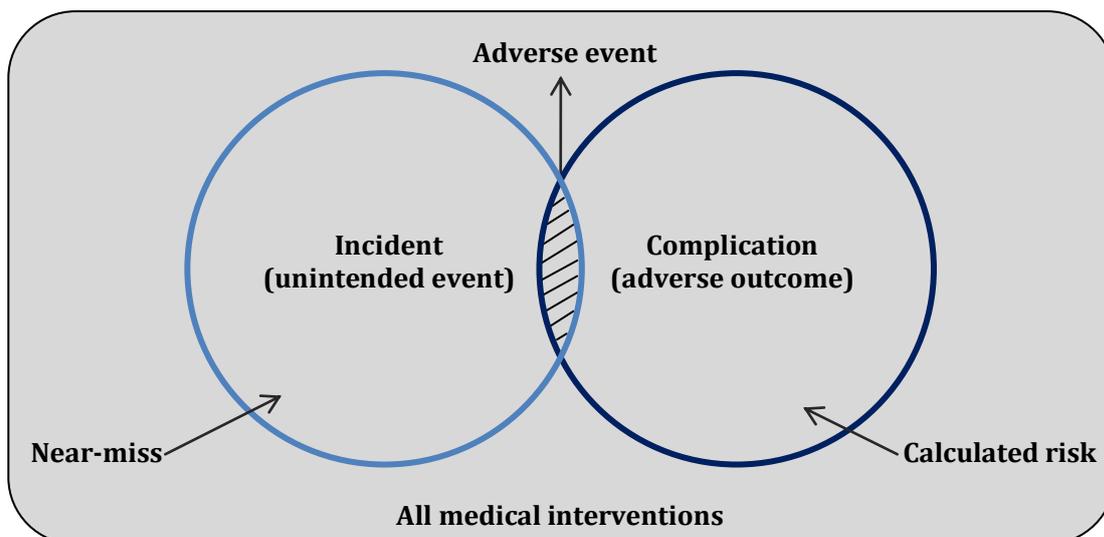
## SAFETY IN HEALTHCARE - BACKGROUND INFORMATION

In the U.S. healthcare system, 275 lives are lost from preventable medical errors every day. The same number of lives is lost when a jumbo jet crashes. During Hurricane Katrina, one of the most destructive hurricanes ever to strike the U.S., 1,836 people died. This is equivalent to the number of lives lost from preventable medical errors every week. With data from *To Err is Human* <sup>[1]</sup>, a landmark study of patient safety, it is calculated that, on average, one out of every 500 people admitted to a hospital in the U.S. is killed by mistake. For comparison, the chance of being killed in a commercial airline accident is one in 415,000. Given these numbers, Amalberti et al. <sup>[2]</sup> concluded that aviation industry is ten times as safe as general medicine and hundred times as safe as surgery.

### What is safety?

Ask 10 people what they think safety means, and it is likely that all 10 give different answers. Even in dictionaries there is no uniform answer. Although safety may seem a clear concept, it cannot directly be measured in size and number. <sup>[3]</sup> Therefore, we regard it as an umbrella term. This paragraph will describe what is meant by safety and the associated terms being used. In order to avoid misunderstandings, the concepts safety and patient safety are used interchangeably.

The Institute of Medicine <sup>[1]</sup> defines patient safety as “freedom from accidental injury”. At the core is patient-centeredness, with the goal that no patient will experience any unnecessary harm, pain, or other suffering. Van Everdingen et al. <sup>[3]</sup> state that there are two leading concepts regarding medical errors: incidents and complications. Incidents are defined as ‘unintended events during the care process that lead to, could have lead or could still lead to injury of the patient’. An adverse event (AE) is an unintended outcome, for example temporary or permanent harm, caused by an incident. An incident not causing injury is called a near-miss. A complication is defined as ‘an unintended and undesired outcome which develops as a cause of treatment of an illness already present’. <sup>[4]</sup> Figure 1 shows the relationship between the two leading concepts and the sub-concepts.



**Figure 1.** Relationship between incident and complication (Adapted from Van Everdingen, J., et al., *Patient Safety Toolbox: Instruments for improving safety in health care organisations*, 2007: Bohn Stafleu van Loghum.)

### Healthcare is in the Stone Age when it comes to safety

The confronting numbers in the first paragraph are part of growing evidence that although most people enjoy good quality care, an alarming and preventable number of adverse events have occurred. [5] Confronting facts on the lack of patient safety in healthcare systems have been confirmed in a number of studies. [3] Luckily, in recent time there has been a growing realization of how unsafe care affects the key stakeholders; patients, healthcare professionals, policy makers, insurance companies and the general public. [6] However, realization is not enough; as several articles and books [7-10] conclude that our healthcare systems are still not as safe as they could be and that increasing attention to safety problems is urgently needed. Krause and Hidley [11] go one step further by saying that healthcare is in the Stone Age when it comes to safety. What is meant here is that other (industrial) organizations have solved problems that healthcare is just beginning to address.

### A global vision on safety

If we look at safety from an international perspective, many countries have made efforts to improve the safety of healthcare. However, up to 2007, this have only led to a coordinated national policy in Denmark and the United Kingdom. Due to the increasing number of studies on adverse events, safety has become the focus of attention. [3] A necessary development, since the findings of these studies show little to no improvement in the incidence of adverse events the past 20 years. The table below summarizes some of the findings of international adverse events studies.

**Table 1.** International adverse events (AEs) studies

	USA [12]	New-Zealand [13]	Canada [14]	Sweden [15]	Brazil [16]	Spain [17]
Year	1984	1998	2000	2003 -2004	2004	2005
Number of admissions (n)	30.195	6.579	3.745	1.967	1.103	5.908
Incidence of AE (%)	3.7	10.9	7.5	12.3	7.6	11.1
Preventable AEs (% of total AEs)	58	37	37	70	66.7	43
Deaths due to AE (% of admissions)	0.291	-	0.66	3.0	-	4.4

Van Everdingen et al. [3] concluded that, if all international data is combined, in about 3 to 13% of all hospital admissions, adverse events occur. In less than 2% of these adverse events, the injury incurred was of long duration or even fatal. [18]

### Safety in the Netherlands

In the Netherlands, there was no widespread public awareness of patient safety before 2004. [19] In that year, a retrospective patient record review study showed that between 1482 and 2032 potentially preventable deaths occurred in Dutch hospitals. [19] Wollersheim et al. [9] calculated that the costs of incidents in 2004 amounted 167 million euros, about one percent of the total hospital budget. 40 percent of all patients experience too much, too few or incorrect care. Besides that, one out of ten hospitalized patients incurs damage, half of which is preventable. [9] A lot of initiatives to improve patient safety [20-23] have been implemented the last few years, indicating that healthcare professionals are motivated to continuously improve healthcare. Moreover, transparency is required by citizens, the Healthcare Inspectorate and insurers. Healthcare has to deal with an increasing PR-sensitivity and a decreasing error acceptance by the public. And although healthcare service is considered excellent in the Netherlands [24], and Dutch numbers of adverse events are at the lower end of the range compared to results from international studies, there is definitely room for improvement. [9]

## FACTORS INFLUENCING SAFETY IN HEALTHCARE

The enormous progress in medicine has contributed to an increased risk of errors. [3] In recent years, a higher average age of patients has led to a greater vulnerability. In addition, more and more patients have an increased comorbidity. Moreover, due to the rising amount of available relevant information, the complexity of medical treatments has greatly increased. The growing number of healthcare professionals who may be involved in one treatment is also contributing to an increased risk of errors. Other risk areas in the field of safety are the expanding influence of technology, handoffs between departments or organizations, and unpredictability of diseases. At the same time, human factors, such as hurry, lack of sleep, overconfidence and impatience contribute significantly to the occurrence of errors. Other common causes of errors, appointed by Donchin et al. [25], Harrison et al. [26], Benner et al. [27], and Van Everdingen et al. [3], are lack of prevention, excessive workload, technical failures, understaffing and inexperienced staff.

In the literature, two frequently mentioned factors that influence the safety in healthcare emerge. First, the role of the nurse is considered important. According to Balas et al. [28] and Considine [29], nurses play an important role in preventing errors. Not only are nurses crucial to providing high-quality care [30], they are in a unique position to improve patient safety because of their inherent proximity to patients. [30] In a study on medication errors, Leape et al. [32] found that half of the errors were caught before they reached the patient. Nurses were responsible for 85% of these intercepted errors. In the same article, it was concluded that nurses are “the ones most likely to intercept errors”. In conclusion, nurses are the front lines of safety processes and outcomes. [33]

Second, it is concluded in multiple articles that building and maintaining a safety culture leads to a reduction in adverse events [34, 55] and mortality. [36, 37] It is argued by several authors that organizational culture is increasingly being recognized as important for patient safety. [38 - 41] Others, like Gluck [10] and the Association of periOperative Registered Nurses (AORN) [41], describe that patient safety interventions will not be successful without a receptive culture of safety.

### **The nurse's role in medical errors**

In the UKCC's code of Professional Conduct [42], it is stated that care given by a nurse must be safe. Literature provides no explicit definition of safe nursing. However, Shekelle et al. [43] do provide a list of best practices for safe healthcare. In the same article, it is concluded that implementing these practices will likely result in safer care. The practices relevant to nurses together form the description of safe nursing.

The list of best practices for safe healthcare has been incorporated into the report “Making Healthcare Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices.” In this report, it is written that evidence shows that preoperative checklists can help prevent errors and complications related to surgery. [43] Moreover, checklists can contribute to safer healthcare outside the realm of surgery. For example, the use of the Michigan ICU checklist has led to a decreased number of patients with central line-associated bloodstream infections (CLABSI). [44, 45] Reducing CLABSI by means of bundles is another practice with a high effectiveness on patient safety. Practices that reduce CLABSI include hand hygiene prior to catheter insertion, the use of antimicrobial central venous catheters (CVC) and educational interventions with regard to CVC insertion. [46] At the same time, urinary catheters also play an important role in providing best practices healthcare. [43] Prevention strategies, bundled in so-called “bladder-bundles” [47], are effective in reducing the one million catheter-associated urinary tract infections per year. [48]

Another type of infection where safe nursing should focus on is ventilator associated pneumonia (VAP). Umscheid et al. [49] concluded that, in the U.S. alone, 14,000 to 20,000 lives could be saved each year if VAP best practices were universally applied to all patients on mechanical ventilation. These, and other healthcare-associated infections, are frequently preventable through hand hygiene. [50] Although this fact is well-accepted, compliance with this practice is often low. [50] Hand-hygiene interventions can achieve a statistically significant reduction in healthcare-associated infections. [51] The remaining essential patient safety practices are interventions to improve prophylaxis for venous thromboembolisms, the use of ultrasound for central line placement and multicomponent interventions to reduce pressure ulcers. [43]

Other practices for which sufficient evidence of effectiveness is found in the literature include multicomponent programs to reduce falls [52 - 54], documentation of patient preferences for life-sustaining treatment [55], obtaining informed consent [56], team training [57, 58], rapid response systems [59] and utilizing complementary methods for detecting adverse events. [60]

### A culture of safety

Although within healthcare neither a common definition nor a common view on the components of safety culture exists, there is an agreement that safety culture is ‘the way we do things around here’. [3] One of the most prominent and most-commonly used definitions of safety culture [61] is developed by the UK Health and Safety Commission (HSC):

*‘The product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization’s health and safety management.’*

However, without a description of the characteristics of safety culture, it cannot be determined whether a culture of safety is created. A systematic review utilizing meta-analysis, performed by Sammer et al. [62], combined the results of several studies on safety culture in healthcare. Since the concept safety culture is regarded as an umbrella term [63], it will be described on the basis of the factors under the umbrella; the subcultures. A broad range of safety culture properties were found in the literature, and organized into seven subcultures: (1) leadership, (2) teamwork, (3) evidence-based, (4) communication, (5) learning, (6) just, and (7) patient-centered. These subcultures are the pillars of safety culture, as is illustrated in figure 2.



**Figure 2.** The 7 pillars of safety culture

### Conclusion

Literature shows that both safe nursing and a culture of safety are regarded important in reducing medical errors. For this reason, Gelre Hospitals Apeldoorn developed an intervention, Take Care, with the goal to promote safety culture and reduce medical (nursing) errors. In the next chapter, the Take Care program is further explained.

## AN INTERVENTION TO IMPROVE SAFETY IN HEALTHCARE - TAKE CARE

Take Care is a peer-to-peer audit instrument in which the Appreciative Inquiry (AI) principle plays an important role. AI is a philosophy for effective, positive change. [64] The major assumption of AI is focusing on what works within an organization, rather than on what is going badly. Hammond [65] states that change can be managed through identifying what is working, and to analyze how to do more of that. Take Care is developed to reach several changes, objectives, with regard to the nursing process. The most important objectives of Take Care are:

- Demonstrably improve the safety culture on the nursing wards
- Nursing actions demonstrably according to current nursing standards and guidelines, such as protocols for pressure ulcers and falls

The Take Care audits are being carried out in two days by specially trained nurses. Information is obtained from four different components: (1) patient records, (2) interviews with patients, (3) interviews with nurses, and (4) several observations of patient visits and meetings on the ward. Table 2 below describes the topics that are covered during the Take Care audits with regard to the four components. The standardized electronic questionnaires are filled in with a numerical rating linked to the questions. This rating makes the results comparable at various key moments within the ward and between different wards. The exact content of these four components can be found in the annexes.

**Table 2.** Topics covered in Take Care audits

Patient/ medical records	Patient interviews	Nurse interviews	Observations patient visits and meetings
Reporting (for instance pressure ulcer risk score)	Safety perception of the patient	Performing orders	Medication
Unnecessary actions	Complaints	Safety rounds	Transfer moments
Transfers	Information provision	Discharge policy	Doctor visits
Compliance and processing agreements	Service and interpersonal conduct	Assessment of the safety and response culture	General behavior
Check on performing risk assessments and follow-up actions	Approach by staff (doctors, nurses, other personnel)	Circumstances during evening, night and weekend	Patient care
Pain registration	Physical examinations	Working environment	Multidisciplinary consultation (MDO)
Discharge	Discharge	Early Warning System (EWS)	Vital checks

### Auditors

A fixed group of auditors is trained to conduct the audits. Jamtvedt et al. [66] contends that audits continue to be widely used as a strategy to improve professional practice. A logical reason for this development is that interactive techniques, such as audits, are the most effective at simultaneously changing physician care and patient outcomes. [67] During the training, the healthcare coordinators are in the lead. Several nurses also participate in the training. In total, the fixed group is composed of 24 healthcare coordinators and nurses. The training these 24 have had in preparation for the audits consists of various components. First, an explanation was given to clarify the project and the corresponding objectives. Second, the auditors group was trained to work with the measuring instruments developed. In addition, skills in the application of the above-mentioned tools were trained, including giving and receiving feedback and conversation training. The final component of the training covered the reporting; how to do a positive critical representation of the findings.

## Planning

Every clinical department participates two times a year: one session for an extensive audit and another session for a check on the agreements made. Each session consists of two days. On these audit days, two teams of four specially trained nurses and two staff members of the department patient safety are separately interviewing patients and nurses, doing observations of patient visits and checking the patient records. At the end of the audit, both audit teams discuss the first results with the nurses, the healthcare coordinators, the head of department and the care manager. In addition, feedback to the department is provided and an evaluation takes place. The audit team, together with the program manager and staff members of the department patient safety, composes an improvement plan based on the audit results within 4 weeks after the first audit. This improvement plan ends with conclusions and recommendations.

Besides the results with regard to the above-mentioned components, the plan consists of a score on the so-called culture ladder. This ladder is derived from IZEP, a Dutch instrument for self evaluating the patient safety culture in hospitals. [68] In IZEP, the five culture levels of Parker and Hudson's framework for understanding the development of organizational safety culture [69] are proposed as an evolutionary ladder. Using this instrument, it is determined on which rung the department in question is on. The culture ladder has five rungs, as can be seen in figure 3. The rungs are explained in detail below, starting with the highest rung.

- **Generative**

The nirvana of all safety departments. Safety is an integral part of everything employees do. Everyone is aware of and involved in the subject patient safety, there is a continuous risk assessment and evaluation of the improvements.

- **Proactive**

Improving patient safety is a high priority for departments on the proactive rung. Statistics are used to find trends and improvement plans based on the statistics are implemented and evaluated. Employees that bring up safety related issues are rewarded.

- **Bureaucratic**

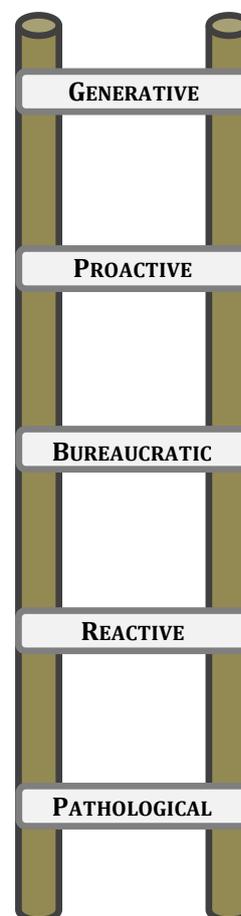
Departments where safety consists of the 'tally of incidents' to show during safety rounds that they focus on patient safety. There are notification systems, the input is analyzed and there are many statistics available.

- **Reactive**

On these departments, safety is taken seriously, but only for a short period of time after an accident. Workforce has to be forced to comply with rules and procedures. There are discussions to re-classify incidents.

- **Pathological**

Departments on the bottom rung have an attitude of 'why waste our time on safety'? Employees believe that safety prevents the hospital from doing business. There is little or no investment in improving patient safety.



**Figure 3.** Culture ladder

Back to the Take Care planning. Four months after completion of the first audit a re-audit takes place, carried out by the responsible care manager along with a program manager. They determine the progress made. Are all bottlenecks resolved? Then the department is eligible for an internal quality mark. If not, escalation will take place towards the director Results and Performance Accountable Unit. One year after the Take Care audit, the audit cycle takes place again. The process description of Take Care is illustrated in figure 4.



Figure 4. Process description Take Care

### Principles

A number of principles are applied in the Take Care project:

- The patient is central
- The audits should lead to areas for improvement
- Digital recording and processing of results
- Peer to peer feedback from heads of department, healthcare coordinators and nurses

### Project organization

The Take Care project concerns all 10 clinical departments of Gelre Hospitals Apeldoorn. The project organization consists of seven people; the director of the Results and Performance Accountable Unit Apeldoorn, the chief of the department patient safety and quality of care, two staff members of this department, two program managers and the chief of the clinical department in which the audits are held. The director of the Results and Performance Accountable Unit is the principal and has the final responsibility. If necessary, the project team seeks the opinion of the medical staff quality dome's chairman. Secretarial support is provided by the department patient safety and quality of care.

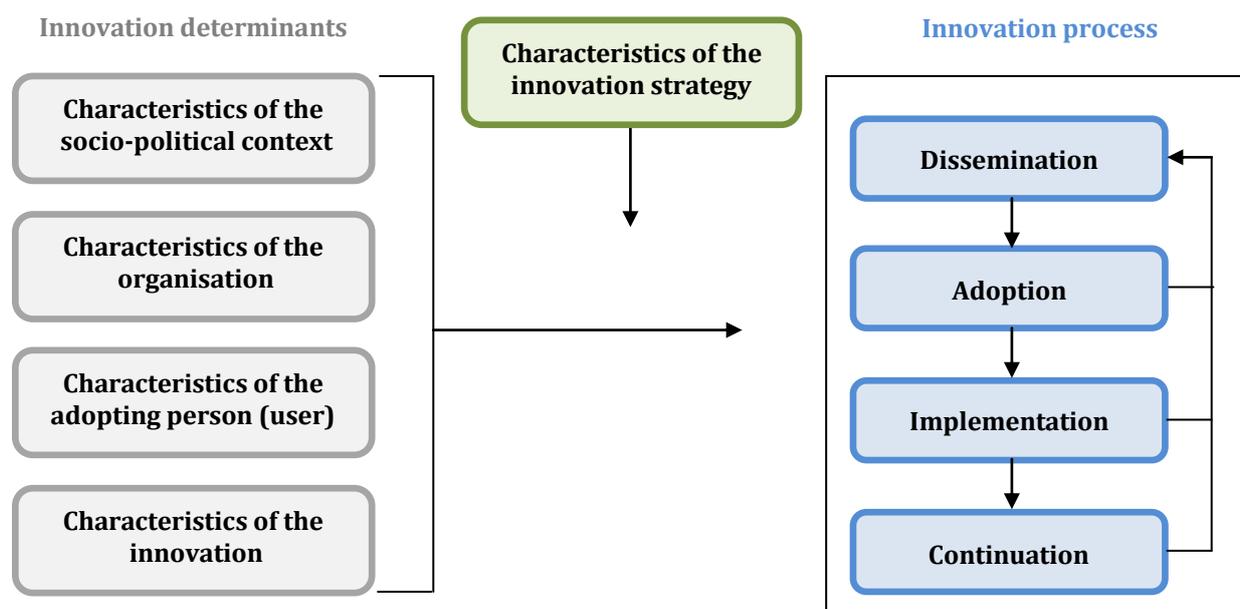
### Budget

Take Care is performed with the existing capacity and resources. However, additional effort of the healthcare coordinators and nurses is requested. The principal has made an estimate of this additional effort, resulting in 0.5 fte extra capacity. The extra capacity needed is ensured by the principal.

## IMPLEMENTING AN INTERVENTION

When introducing an innovation to health care, it is important to gain insight into determinants that may stimulate or obstruct the introduction, so that an appropriate strategy for introducing the innovation can be designed. Reason for this is that research has shown that the introduction of an innovation, defined by Rogers [71] as ‘an idea, practice, or object that is perceived as new by an individual or other unit of adoption’, to healthcare is widely recognized as a complex process. [72] Signals from within Gelre Hospitals Apeldoorn confirm that this is also the case regarding the implementation of the Take Care program.

A theoretical framework of Fleuren et al. [72] describes the main stages in an innovation process and the related categories of determinants. This framework appoints that the innovation process has four stages, namely dissemination, adoption, implementation, and continuation. The transition from one stage to the next can be affected by various determinants. [72] Paulussen [73], together with Fleuren et al. [72], appoints that these determinants, critical for successful use of healthcare innovations, can be divided into four different components: (1) characteristics of the socio-political context, such as rules and patient characteristics, (2) characteristics of the organization, including financial resources and staff, (3) characteristics of the user of the innovation, like outcome expectancy and satisfaction, and (4) characteristics of the innovation, such as completeness and visibility of results.



**Figure 5.** Framework representing the innovation process and related categories of determinants (Adapted from Fleuren, M., K. Wiefferink, and T. Paulussen, *Determinants of innovation within health care organizations Literature review and Delphi study*. International journal for quality in health care, 2004. 16(2): p. 107-123.)

The theoretical framework, above visualized in figure 5, originally consisted of 60 potential relevant determinants. After this report, the authors realized that a list of 60 determinants was too long. Therefore, another study was conducted, commissioned by a Dutch independent research organization called TNO, to reduce the number of determinants and to convert this reduced list into a generic diagnostic tool. [74] A comprehensive literature study, followed by a Delphi study among implementation experts, resulted in a list of 29 determinants.

All determinants are incorporated into MIDI: Measurement Instrument Determinants of Innovations. MIDI is a generic and short measurement instrument to map the determinants of the use of innovations in healthcare. Since the Take Care program is an innovation, MIDI can be used to map stimulating and obstructing factors in the implementation of Take Care, so that an appropriate strategy for the ongoing implementation can be designed.

## RESEARCH QUESTIONS

As described in the introduction, the Take Care program is central in this thesis. As is the case with every kind of intervention, it must be critically assessed. Assessment of the quality, implementation and satisfaction can be used routinely to see if the intervention remains on track. According to the Board on Global Health of the Institute of Medicine <sup>[75]</sup>, mixed methods evaluation, in which both the effect and the process are evaluated, works best. The Take Care program is assessed using these two different perspectives. On the one hand, the effect of Take Care on the nursing process is determined using two safe nursing practices that play an important role in providing best practices healthcare; reducing pressure ulcers and falls. These adverse outcomes represent serious quality of care issues. <sup>[70]</sup> On the other hand, the MIDI instrument of Fleuren et al. <sup>[74]</sup> is used to map the stimulating and obstructing factors in the implementation of Take Care. As a result, two research questions come forward, as can be seen in the text box below. The importance of answering these questions is to determine if the intervention remains on track or not. If not, specific implementation strategies can be designed.

### **Research questions**

- I. *What is the effect of the Take Care program on the safety culture, pressure ulcers and falls in the clinical departments of Gelre Hospitals Apeldoorn?*
  
- II. *What are stimulating and obstructing factors in Gelre Hospitals Apeldoorn for the actual use of the Take Care program, according to board members, medical specialists, heads of departments, healthcare coordinators and nurses?*

# METHODOLOGY

## MIXED METHODS RESEARCH DESIGN

In mixed methods research, quantitative and qualitative data of one phenomenon is collected, analyzed, and interpreted. [76] In this thesis, the Take Care program is the investigated phenomenon. With regard to quantitative research, retrospective data is used to determine the effect of Take Care, on the nursing wards, on the variables pressure ulcers, falls and the number of VIM-notifications. Since it is not feasible to measure the effect of Take Care on the safety culture using quantitative data, the effect on this variable will be measured using qualitative research. The qualitative effect measurement of Take Care on the safety culture is incorporated into the interviews. Face-to-face interviews with internal stakeholders will be used to answer the second research question. The mix methods research design described above is visualized in figure 6. The following chapters describe both the quantitative, as well as the qualitative data collection method in detail.

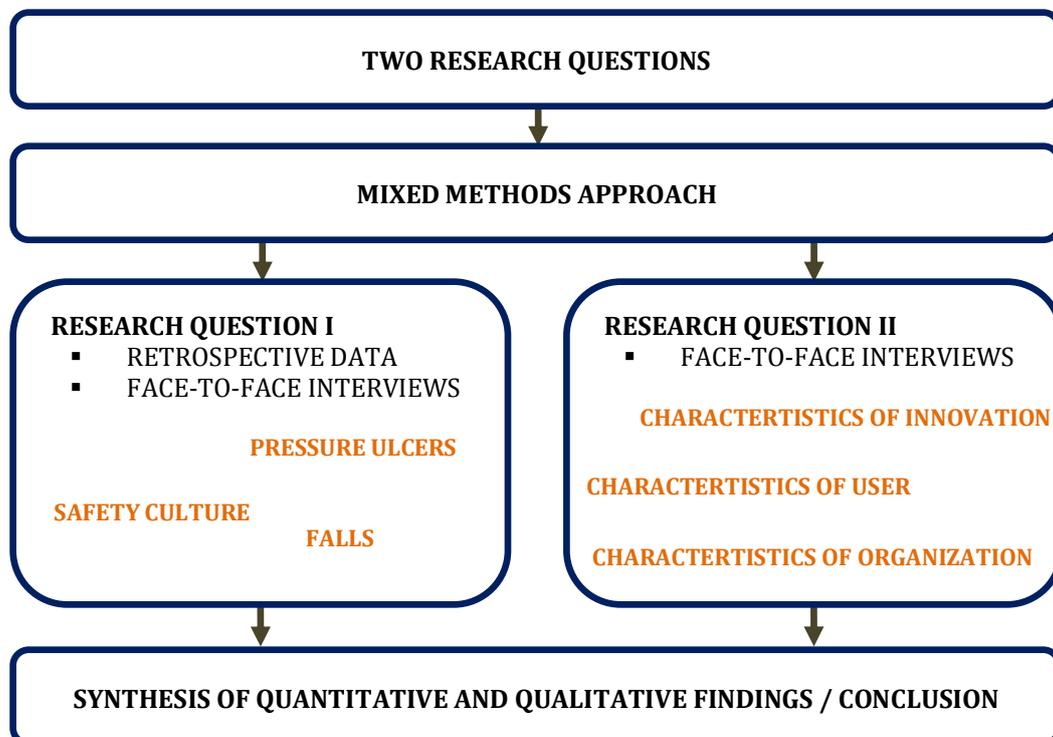


Figure 6. Mixed methods research design

## RESEARCH QUESTION I

*What is the effect of the Take Care program on the safety culture, pressure ulcers and falls in the clinical departments of Gelre Hospitals Apeldoorn?*

The first research question was answered using a mix of retrospective data and face-to-face interviews. Retrospective data was collected of the variables pressure ulcers and falls in order to determine the effect of Take Care in a quantitative manner. The effect of Take Care on the variable safety culture was measured using qualitative research; face-to-face interviews. On most departments, the Take Care audit, as well as the re-audit, has already taken place. To determine the effect of the program on the before mentioned variables, data is gathered before and after the audits. The relevant departments, together with the corresponding specialties and the year of the audit and re-audit, are listed in table 3.

**Table 3.** Relevant departments research question I

No.	Department/Specialties	Audit/re-audit
A4	Cardiology	2012 / 2013
A5	Gastroenterology and hepatology	2012 / 2013
A6	Gastro-, entero-, oncology and vascular surgery	2012
A7	General surgery, gynecology, urology, ENT (ear, nose and throat), maxillofacial surgery and plastic surgery	2012
B5	Lung diseases	2012 / 2013
B6	Oncology	2012
B7	Traumatology, short stay, breast care, plastic surgery	2012
B8	General Internal, Urology and Gynaecology	2012
F1	Geriatrics	2012 / 2013

### Safety culture

#### Data collection

The effect of Take Care on the safety culture was measured using face-to-face interviews. In the interviews, the interviewees were asked whether the objective of the program, improving the safety culture, was achieved within the department. The answer possibilities were running from 'absolutely not' to 'certainly not', 'as likely as not', 'certainly' and 'very certainly', in line with a five-point Likert scale. After answering this fixed question, the interviewees were asked to explain the given answer.

#### Participants

Board members, medical specialists, heads of departments, care coordinators and nurses were interviewed. In total, 16 interviewees answered the question regarding the safety culture. Most of them were heads of departments, healthcare coordinators and nurses, since they were familiar with the Take Care program.

#### Analysis

The above-mentioned answer possibilities were given weights of 1, 2, 3, 4 and 5, respectively. In Microsoft Office Excel 2007, the frequency distribution was calculated. The scores are displayed in the results section. Furthermore, the qualitative part, in which the interviewees explained their answer to the fixed question, is described.

## **Pressure ulcers**

### Data collection

Bergstrom <sup>[77]</sup> defines a pressure ulcer, also known as decubitus ulcer or bedsore, as ‘any lesion caused by unrelieved pressure resulting in damage of underlying tissue’. The European Pressure Ulcer Advisory Panel (EPUAP) has classified pressure ulcers into grades, ranging from grade I to IV. <sup>[78]</sup> In grade I, patients have an intact skin with non-blanchable redness, while grade IV represents extensive destruction of the skin with exposed bone, tendon or muscle.

The data, which was obtained from the Dermatology department, included the prevalence of pressure ulcers within Gelre Hospitals Apeldoorn. The prevalence of type I pressure ulcers was excluded from the dataset by the dermatology nurse, since it is difficult to determine when a patient has this type of pressure ulcers. In addition, the Healthcare Inspectorate (IGZ) is not only interested in this type of pressure ulcers. Therefore, the data included the prevalence of pressure ulcers type II till IV, including moisture injury, originated in the own setting divided by the number of patients. The data included the total average prevalence of 2011 and 2012, and the prevalence measured in January 2013.

### Participants

The participants were the number of patients on the departments A4, A5, A6, A7, B5, B6, B7, B8 and F1 in 2011, 2012 and January 2013.

### Analysis

A chi-squared test was performed to determine whether there is a significant difference between the expected pressure ulcers prevalence and the observed prevalence.

## **Falls**

### Data collection

Although there are several definitions of falls <sup>[79,80]</sup>, Hughes <sup>[81]</sup> appoints that the American Nurses Association, National Database of Nursing Quality Indicators (ANA-NDNQI) provide an all-inclusive definition of the concept <sup>[82]</sup>: ‘an unplanned descent to the floor (or extension of the floor, e.g., trash can or other equipment) with or without injury. All types of falls are included, whether they result from physiological or environmental reasons’.

The data included the total number of falls in Gelre Hospitals Apeldoorn divided by an estimation of the number of patients. This estimation was done on the basis of the assumption that the bed occupancy always is 100 percent. The falls were measured at nine points in time: each quartile in 2011 and 2012, and the first quartile of 2013. The data was obtained from the previously described database of the department of patient safety and quality of care.

### Participants

The participants were the number of patients, throughout Gelre Hospitals Apeldoorn, in the period of the first quartile in 2011 till the first quartile of 2013.

### Analysis

A chi-squared test was performed to determine if there was a difference between the number of falls in 2011, 2012 and the first quartile of 2013.

## RESEARCH QUESTION II

*What are stimulating and obstructing factors in Gelre Hospitals Apeldoorn for the actual use of the Take Care program, according to board members, medical specialists, heads of departments, care coordinators and nurses?*

A comprehensive description of the interviews is given in this chapter, on the basis of the book 'Basic interviewing', written by Baarda et al. [83] The description starts with choosing a type of interview.

### Interview type

Partially structured interviews, with fixed questions and formulations on the one hand, and a number of open questions on the other hand, were used to answer the second research question. Most of the fixed questions had answer possibilities on a five-category Likert scale, running from 'strongly disagree' to 'disagree', 'uncertain', 'agree' and 'strongly agree'. Goodwin [84] states that a five-point Likert scale provides sufficient discrimination among levels of agreement. The answer possibilities were given weights of 1, 2, 3, 4 and 5, respectively. Other, more complex, scoring methods have shown to possess no advantage. [85] The expected linkages between the determinants and the use of an innovation were positive for almost all determinants: the higher the score of the scale, the higher the expected level of use. Where this was not the case, when a high score represented 'strongly disagree' instead of 'strongly agree', the opposite system of scoring was applied. The answers of the interviewees with regard to the open questions will be used to underpin the scores. An example of a partially structured interview question is given in figure 7.

*The innovation matches with the existing working method*

Strongly disagree    ○    ○    ○    ○    ○    Strongly agree

*Can you explain your answer?*

.....

**Figure 7.** Sample question partially structured interview

### Reliability and validity

In order to improve the reliability of the interviews, a voice recorder was used. When using audio recordings, it is possible to listen to the interview afterwards as many times as needed. As a result, there is a maximum control over the quality of an interview afterwards. [83] The voice recorder that will be used during the interviews is the Olympus VN-8500PC. Regarding validity, one can use other sources of data to increase the correct reflection of reality. The quantitative data described in the previous chapter can be used as a source. If data collected from other sources and the interview results do not contradict each other, this is an indication for a (high) validity. [83]

### Topic list

As was described in the beginning of this chapter, the interviews were held to ask internal stakeholders which determinants influence the actual use of the Take Care program. The MIDI instrument of Fleuren et al. [74] was used as a point of departure. However, due to the limited time available for the interviews, it was not possible to measure all the 29 determinants. It was up to the researcher to determine which determinants were measured. According to Fleuren et

al. [72], it made sense to measure a determinant, when it differentiated depending on the expected variation in the degree of use. Based on this criterion, several determinants were excluded from the research. Other determinants were excluded that, according to the researcher, showed little to no relevance to the Take Care program. In table 4, the crossed out innovation determinants were excluded. The qualitative effect measurement of Take Care on the variable safety culture was incorporated into the question with regard to the outcome expectancy. The components left embodied the topics, while the innovation determinants represented the subtopics.

**Table 4.** Overview innovation determinants (Adapted from Fleuren, M., et al., *Meetinstrument voor Determinanten van Innovaties (MIDI)*, 2012, TNO.)

Determinants with regard to the innovation	
<del>1) Procedural clarity</del>	5) Congruence existing working method
2) Correctness	6) Visibility results
3) Completeness	7) Relevance client
4) Complexity	
Determinants with regard to the user	
8) Personal advantage / disadvantage	14) Descriptive norm
9) Outcome expectancy (safety culture)	<del>15) Subjective norm</del>
<del>10) Task perception</del>	16) Self-efficacy expectation
<del>11) Client satisfaction</del>	17) Knowledge
12) Collaboration client	18) Information processing
13) Social support	
Determinants with regard to the organization	
19) Formal ratification management	24) Availability materials and amenities
<del>20) Replacement in staff turnover</del>	<del>25) Coordinator</del>
21) Capacity / utilization	26) Turbulence in the organization
22) Financial resources	<del>27) Availability information on using innovation</del>
23) Time	28) Feedback to user
<del>Determinants with regard to the socio-political context</del>	
<del>29) Laws and regulations</del>	

Now that it is stated which determinants were measured, the determinants were operationalized, by Fleuren et al. [74], in order to prevent confusion, beginning with those regarding the innovation. Needless to say, the innovation was the Take Care program. The actual questions can be found in the annexes.

### Determinants regarding the innovation

All the determinants belonging to the innovation itself had answer possibilities on a five-category Likert scale, running from 'strongly disagree' to 'disagree', 'uncertain', 'agree' and 'strongly agree'. The opposite system of scoring was applied to the determinant complexity, since the higher the score on this scale, the lower the expected level of use.

- Correctness

The innovation is based on factually accurate knowledge.

- Completeness

The innovation measures all aspects of the nursing process.

- Complexity

The innovation is experienced by the staff as complicated.

- Congruence existing working method

The innovation fits well with how the hospital is accustomed to work.

- Visibility results

The impact of the use of the innovation is clearly visible.

- Relevance client

The innovation is suitable for patients.

### **Determinants regarding the user**

The next component covered the determinants with regard to the user. In MIDI, Fleuren et al. [74] stated that the user can be the end user, as well as the intermediary user. The end user, sometimes referred to as client, was defined as 'person or persons where the effects of the innovation are primarily intended for'; in this case the patient was the end user. The intermediary user represented 'the professionals that ultimately expose the end users to the innovation'; these were the heads of department, healthcare coordinators and nurses.

Five of the seven determinants belonging to the user of the innovation had answer possibilities on a five-category Likert scale. The remaining two, descriptive norm and information processing, had answer possibilities on a seven-point and a four-point Likert scale, respectively.

- Personal advantage / disadvantage

To what extent does the use of the innovation provide advantages or disadvantages for the department?

- Outcome expectancy (safety culture)

I think that the objective of the innovation to improve the safety culture within the department is achieved.

- Collaboration client

Patients will, in general, cooperate when the innovation takes place within the department.

- Social support

I can count on sufficient support from my colleagues, if needed, in addressing the recommendations from the innovation.

- Self-efficacy expectation

If you want to, do you think you will manage to undertake the recommendations from the innovation?

- Knowledge

I think I have sufficient knowledge to implement the recommendations from the innovation.

- Descriptive norm

How big do you think is the group of colleagues in the department that actually does something with the recommendations of the innovation?

- Information processing

To what extent are you aware of the content of the innovation?

### **Determinants regarding the organization**

The final determinants were incorporated into the component regarding the organization; Gelre Hospitals Apeldoorn. Seven determinants were measured to determine the role of the hospital in the actual use of Take Care. Five of these determinants had answer possibilities on a seven-point

Likert scale, while the answers on the two remaining ones, formal ratification management and turbulence in the organization, were either yes or no.

- Capacity / utilization

There is enough staff in the department to implement the recommendations from the innovation.

- Financial resources

There are adequate financial resources available to implement the recommendations.

- Time

The hospital allows sufficient time to implement the recommendations from the innovation.

- Availability materials and amenities

The hospital provides adequate materials and facilities to implement the recommendations from the innovation.

- Feedback to user

In the hospital, regularly feedback takes place on the progress of the implementation of the innovation.

- Formal ratification management

At the hospital, are there formal agreements established by the management with regard to the use of the innovation (in policy plans, work plans, etc.)?

- Turbulence in the organization

Are there, except the innovation, other changes that you encounter now or in the foreseeable future (reorganization, merger, cuts, or other innovations)?

After the topic list was drawn up, one could start recruiting people for the interviews. The process of preparing the interviews, the actual interview itself, and the processing and analyzing of the data afterwards is described in the next paragraphs.

## **Participants**

In a conversation with one of the supervisors, the internal stakeholders, board members, medical specialists, heads of departments, care coordinators and nurses, were selected for an interview. Members of the board and management were chosen based on their knowledge with regard to Take Care and other patient safety initiatives. The heads of the departments on which the Take Care audits had taken place were asked to participate in the interviews. In addition, it was requested to these heads of departments to interview two nurses. Furthermore, the auditors of the 2013 Take Care audits, care coordinators and nurses, were sent a request to participate. Medical specialists, one of every department/specialty presented in table 3, were listed in Excel with a corresponding number, after which the RANDBETWEEN function randomly chose the specialist being interviewed.

## **Data collection**

### Interview scheme

Drawing up an interview scheme was the final preparation prior to an interview. <sup>[83]</sup> The topics, as well as the subtopics and the instructions for the interview, are addressed in this scheme. It is designed in such a way that other people, besides the interviewer, also can interview the person in question. The exact content of the interview scheme can be found in the annexes.

### Beginning the interview

After a proper introduction, the interviewer is arrived at the point that the first open question must be asked. First, the interviewer should not ask guiding or suggestive questions, such as “What do you think of your supervisor’s weak policy?” Asking more general questions is the solution. [83] Second, the interviewee can also be influenced when additions are given. If an addition is added, a question looks like this: “Can you tell us something about your view on the supervisor’s policy ... for example with regard to medication, or reporting incidents?” By removing the additions, the interviewee is not steered into a particular direction. Other factors that should not be added are terminology and double negatives. A double negative uses two negative words in one sentence: “Don’t you think that supervisors should not change their policy?” Finally, the interviewer must ensure that the interview does not become a survey: “The first question is: What do you think of ...? The second question is: ...”

### Responses

Baarda et al. [83] describe possible responses to the question asked. It is possible that the interviewee does not respond immediately. Another common reaction to the opening question is the use of a counter question by the interviewee: “What do you exactly mean?” There are several possibilities to continue after such a question. The interviewer can repeat the question in slightly different words. In addition, repeating the question after the interviewer has shown understanding and narrowing down the question are also methods to continue.

### Rounding off

When all topics are discussed, it is time to round off the interview. By indicating that the last question is asked, one can start rounding off the interview. Subsequently, a short summary is given about the interview and the interviewee is asked whether he wants to add something. If desired, it is promised that a copy of the thesis is send to the interviewee. The interview ends, after the audio recorder is turned off, with a word of thanks.

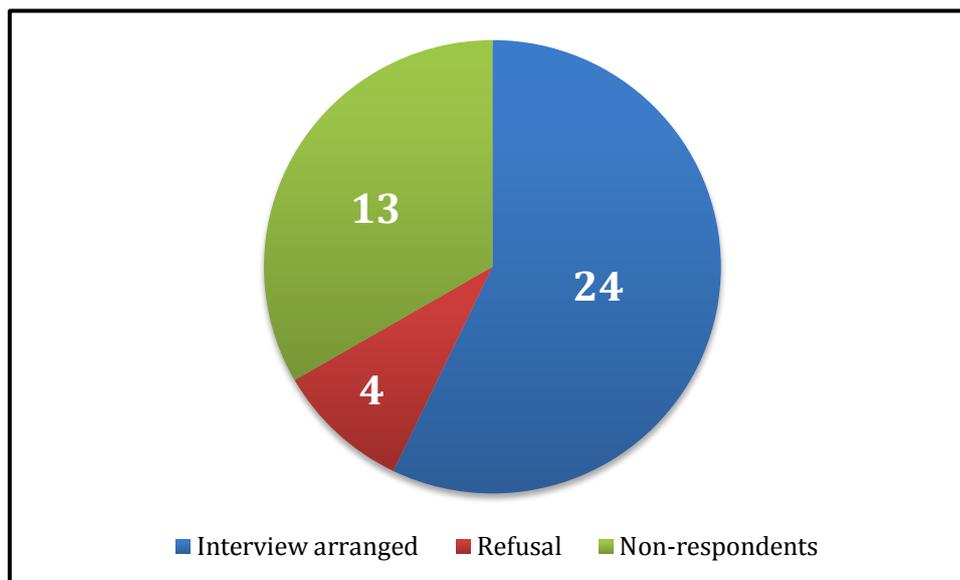
### **Analysis**

According to Wydooghe [86], one must first write out the interviews. After this step is completed, the text should be made easier to read. This means removing repetitions, complementing broken sentences and splitting long sentences in short ones. Now that the raw interviews are processed into a more solid text, one must focus on analyzing the qualitative data.

Baarda et al. [87] provide clear guidance by appointing seven steps that should be undertaken in analyzing qualitative data, beginning with labeling. The function of labeling is to globally identify the text fragments. Although this is regarded as one of the most difficult steps in the analyzing process, the theoretical framework of Fleuren et al. [72] provides assistance. Since the interviews are based on this framework, the labeling has already been done, resulting in a reduction of a large amount of data into a collection of labels. The next step is the process of organizing labels and bringing them back to core themes, a process called axial coding. [87] In the framework, the determinants are already organized into three components, as can be seen in table 4 in the beginning of this chapter. Since all new information is hereby labeled in the same way, the validity of the labels is determined.

### **Response rate**

In total, 42 employees were invited to participate in the study. After the invitations, 24 of the 42 gave permission for an interview (response rate 57,14%). Babbie [88] states that a response rate of 50% is adequate, 60% good, and 70% very good. All employees were contacted by email to make an appointment for the interview in the months May and June. Figure 8 visualizes how many of the invited employees refused to participate or not responded to (several) emails.



**Figure 8.** Response rate interviews

### Background characteristics interviewees

Table 5 presents the background characteristics of the interviewees, including age, gender and job title. The average age of the interviewees in the sample was 40.75 years (SD = 9.36). The average age of the sample corresponded with the mean age of employees of Gelre Hospitals (M = 42.50), and with the age of all personnel in Dutch hospitals (M = 41.80). The male/female ratio in the sample was representative, since the proportion of women in hospital personnel in the Netherlands is high (82%).

Almost half of the sample (46%) was working as a healthcare coordinator and/or nurse. A report written by the foundation Dutch Hospital Data <sup>[89]</sup> showed that, of 120.749 patient-related personnel in Dutch general hospitals, 64.980 (54%) are working as a nurse. As can be seen in table 5, over one fifth (21%) of the interviewees were employed as medical specialist. This was in accordance with national data; De Visser and Schoenmakers <sup>[90]</sup> displayed that in Dutch hospitals almost one fifth of the personnel (19%) had a medical education.

**Table 5.** Background characteristics participants (n = 24)

Demographic	Participants	
	Frequency	Percentage
<b>Age</b>		
< 25	0	0.0
25 - 29	3	12.5
30 - 39	10	41.67
40 - 49	7	29.17
50 and over	4	16.67
<b>Gender</b>		
Male	6	25.0
Female	18	75.0
<b>Job title</b>		
Board member/director	2	8.33
Medical specialist	5	20.83
Head of department	6	25.0
Healthcare coordinator/nurse	11	45.83

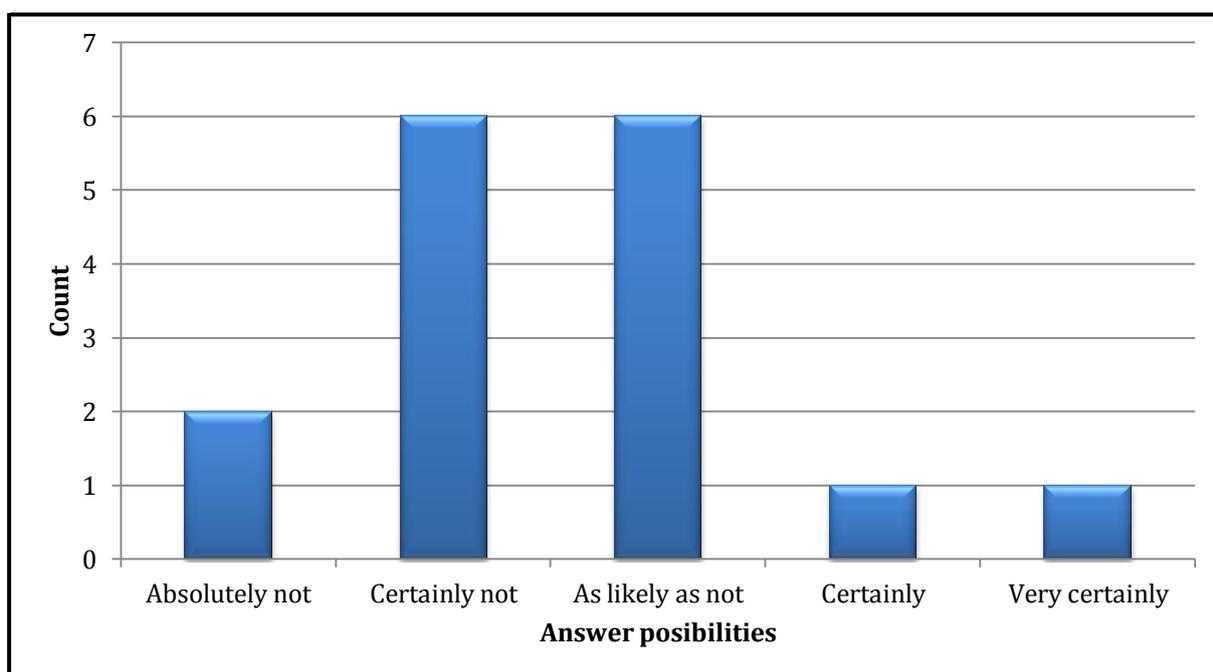
## RESULTS

### RESEARCH QUESTION I

The main findings regarding the effect of the Take Care program on the safety culture, pressure ulcers, falls and the number of VIM-notifications are described and presented below, beginning with the safety culture.

#### Safety culture

Not all interviewees were familiar with Take Care, or could say whether the objective of improving the safety culture was achieved. Therefore, 16 of the 24 interviewees answered the question. Figure 9 displays the calculated frequency distribution.



**Figure 9.** Frequency distribution safety culture, internal stakeholders ( $n = 16$ )

The average score was 2.56 (SD = 1.03). Half of the sample stated that Take Care had no effect on the safety culture, a few (12%) indicated that the program did not have an effect, and more than a third of the interviewees (38%) defined the effect of Take Care as 'as likely as not'.

In the qualitative part, in which the interviewees were asked to explain their answer, those that stated that Take Care had no effect on the safety culture believed that this was due to three frequently heard reasons. First, the program focused not or too little on the processes on a department. *"To improve the safety culture, the audits have to be done in a proper way. Assessing the safety culture on the basis of processes on a department, with open questions, is the right way. [...] Let others tell you what is going right and wrong on a department"*. Second, the reshuffling in late March this year, in which most departments shifted to another location in the hospital, was a frequently mentioned factor. Third, some of the interviewees labeled the objective of improving the safety culture as 'not reached yet'. A head of department explained. *"You are talking about culture, and culture is a long-breath issue"*.

Although the objective of improving the safety culture has not been reached, according to most interviewees it still can be reached. *“Measuring the safety culture is not equal to behavioral change. Take Care is an eye-opener, after which agreements must be made to improve the culture”*, a head of department said. Similar answers were given by the interviewees that defined the effect of Take Care as ‘as likely as not’. *“I cannot say what the effect of the program is. Creating a culture of safety is not easy, of course. Actually, you hope that the objective is completely achieved, but in practice this is not always the case”*.

Two interviewees, from different departments, felt that Take Care had a positive effect on the relevant department. *“The objective is certainly reached; all safety themes are extensively reflected in the program. The subject safety culture is made negotiable and that is the core; talking with each other about safety”*. Only two interviewees believed that Take Care contributed nothing to the safety culture. *“There is no support for improving the safety culture on the department. It is perceived as something from above and as a result, there is a lot of resistance”*.

Medical specialists, not familiar with the program, were asked what role internal audits play in improving the safety culture. Most of the specialists (80%) were of the opinion that internal audits play an important role in improving the culture of safety. *“If you have been working on a department for many years, you do not see certain things anymore. There may be some blind spots, and internal audits can help by assessing certain processes”*.

### Pressure ulcers

The mean prevalence of pressure ulcers in the departments was four percent (SD = 3.32). This is in line with the prevalence of pressure ulcers, in 2012, in Gelre Hospitals broad (3.9%) and Dutch general hospitals (4.0%). Using a chi-squared test, the total prevalence of 2012, as well as the prevalence of each department, with respect to that of 2011 was compared. In addition, the prevalence of January 2013 was also compared with the prevalence of 2011. The results are displayed in table 6. As can be seen, there was no significant difference between the total expected pressure ulcers prevalence in 2012 and the total observed prevalence in 2011,  $\chi^2(1, N = 1391) = 1,509, p = .2193$ . The results also showed no difference between the data of January 2013 with respect to the data of 2011,  $\chi^2(1, N = 804) = 0,0053, p = .942$ .

**Table 6.** Chi-square test - prevalence pressure ulcers 2012 and January 2013 with respect to prevalence of 2011

	N	2011	N	2012	N	January 2013
Total	593	26 (4,4%)	858	25 (3,1%)	211	9 (4,3%)
A4	57	0 (0,0%)	102	3 (2,9%)	20	1 (5,0%)
A5	58	6 (10,3%)	90	1 (1,1%)*	23	0 (0,0%)
A6	81	4 (4,9%)	104	7 (6,7%)	29	0 (6,7%)
A7	68	2 (2,9%)	92	2 (2,2%)	-	-
B5	85	1 (1,2%)	107	1 (0,9%)	33	0 (0,0%)
B6	71	6 (8,5%)	91	7 (7,7%)	24	2 (8,4%)
B7	88	3 (3,4%)	83	2 (2,4%)	27	2 (7,4%)
B8	71	3 (4,2%)	94	1 (1,1%)	24	2 (8,3%)
F1	14	1 (7,1%)	35	1 (2,9%)	10	1 (10,0%)

\*  $\chi^2$ -test, p-value < 0.05

### Falls

The chi-squared test was used to compare the number of falls in 2012 with the number of falls in 2011. Furthermore, the number of falls in the first quartile of 2013 was also compared with the number in 2011. The results are displayed in table 7. No significant difference between the number of falls in 2011 and 2012 was found,  $\chi^2(1, N = 54384) = 0,107, p = .744$ . The results also showed no difference between the falls in the first quartile of 2013 and the number of falls in 2011,  $\chi^2(1, N = 33990) = 1,263, p = .261$ .

**Table 7.** Chi-square test – number of falls 2012 and first quartile 2013 with respect to number of falls in 2011

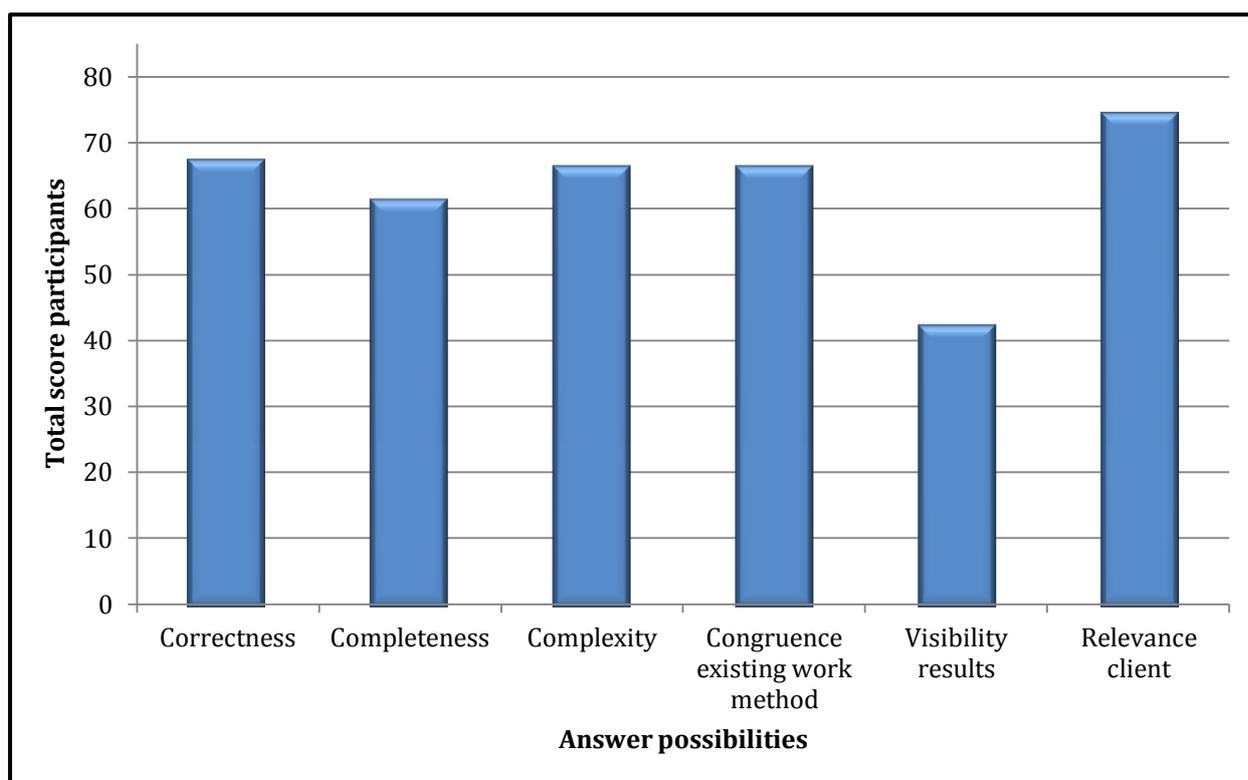
	N	2011	N	2012	N	First quartile 2013
Total	27192	167 (0,6%)	27192	173 (0,6%)	6798	50 (0,7%)

## RESEARCH QUESTION II

The main findings concerning the determinants regarding the innovation, the user and the organization are described and presented below, beginning with the determinants relevant to the innovation. Since some of the interviewees were not familiar with the program, the scores of 17 interviewees are displayed in the figures below.

### Determinants regarding the innovation

The determinants are described separately in the paragraphs below, but first an overview of the total scores is presented to see at a glance what stimulating and obstructing factors are for the actual use of the Take Care program. In figure 10, a relatively high score of a determinant represents a positive influence on the actual use, and a low score a negative influence.



**Figure 10.** Overview scores determinants innovation (maximum score = 85)

#### Correctness: the innovation is based on factually accurate knowledge

Not one interviewee gave correctness a negative score, this is reflected in a high mean score ( $M = 3.94$ ,  $SD = 0.75$ ). With a total score of 67, correctness had the second highest total score within the component innovation. The majority (71%) answered the question with either 'agree' or 'strongly agree'. "What is being done in the program is actually very factual", an auditor explained. "the auditors visit a department and check patient records. A few days in advance of the audit, data regarding the department is gathered. So, current data is used, and all safety issues are considered within the program".

Others were somewhat less positive. "It provides a snapshot; you look at patients who are on the department at that time. [...] The aspects being measured are reasonably objective/factual, the interpretation given to it is subjective". Nearly one third of the interviewees (29%) did not agree or disagree. "There are different ways to generate information during an audit", a head of department clarified, "on the one hand, an analysis on patient records is performed. [...] The part of

*questioning nurses, interviews with nurses, and interviews with patients is, in my opinion, subjective". All medical specialists interviewed stated that an innovation, such as internal audits, should be based on factually accurate knowledge. "Or at least strive for factually accurate knowledge, as much as possible".*

Completeness: the innovation measures all aspects of the nursing process

As was the case with the determinant correctness, the mean score was relatively high (M = 3.59, SD = 0.71). The mean score was somewhat lower due the negative scores given by two interviewees. *"The nursing process is not an autonomous process; there is a lot of common ground with the medical section. I think that, even though it is the nursing process that is being assessed, you need to involve specialists in the medical field too".*

Most the interviewees (71%) believed that Take Care provided a global picture of a department. Nobody answered the question with 'strongly agree'. *"For an overall picture you should visit the department 24 hours. Measuring all aspects of the nursing process is far too much, and therefore not feasible, in two days.*

Besides positive feedback, there were also critical remarks. *"In advance of the audit, they do not look at existing projects on the department"; a head of department explained her critical remark. "There were things in the recommendations after the audits that already were translated into existing projects. [...] They need to tune with what is already happening on the department by interviewing the head of department". As was already mentioned before by other interviewees, not involving other disciplines was also a critical remark. "For example, no questions were asked to the physiotherapist, who visits the department a lot, what he thinks about the prevention of falls. Other disciplines are less addressed during Take Care".*

Complexity: the innovation is experienced by the staff as complicated

The opposite system of scoring was applied to this determinant. The mean score was 4.13 (SD = 0.62), the second highest within the component regarding the innovation. The vast majority of interviewees (88%) believed that Take Care was not experienced by the staff as complicated, or too complicated. However, according to the interviewees, this does not automatically mean that Take Care is seen as positive. While a few interviewees stated that Take Care was experienced positively by the staff, the majority had a different opinion. *"It is experienced as a check on the nursing actions". "Take Care is experienced by some colleagues as a burdensome program". "I think nurses believe that the program will give them a rap across the knuckles". Another reason for these opinions was that "the appreciative inquiry (AI) principle is not addressed in the audit and the report. [...] When I read the report, it said that you are kindly received on the department. However, it continues by enumerating what is going wrong. [...] I got a negative feeling when reading the report".*

How the staff experienced Take Care was, according to the interviewees, also depending on the head of department. *"Sometimes I think that the head of department had some difficulty with implementing the recommendations. Luckily, guidance is hereby provided. The heads of department play an important role in motivating and informing the staff regarding Take Care".*

Congruence existing working method: the innovation fits well with how the hospital is accustomed to work

The answer lies in the high mean score (M = 3.88, SD = 0.70). However, one interviewee gave a negative answer. *"Apparently this is the way they want to work. Personally, I have some difficulty with it". The large majority had a different view. "I think that the program is a good representation of how Gelre Hospitals wants to work. Take Care coincides with other projects within the hospital. It is a bit more accessible since your own colleagues are the auditors. It is nice that nurses are asked to assess other departments. They have a feeling with the nursing activities and they understand how a department operates".*

Visibility results: the impact of the use of the innovation is clearly visible

The total score was considerably lower than the other determinants ( $M = 2.63$ ,  $SD = 1.09$ ). Half of the interviewees told that Take Care had little to no effect. *“The effects are not clearly visible. On the department, you hear little about Take Care. A recommendation is given, we have read it, but it is not clear to me what happened afterwards with it”. “The recommendations emerging from Take Care are really feasible and can improve the quality of care”, a nurse explained. “But if I look at our department, we have completely changed after the reshuffling. Half of the recommendations are now useless; they are no longer relevant anymore”.*

A frequently heard comment was *“to plan the audits after the staff within a department has worked together for six months after the reshuffling. [...] First, we need time to become a department, and then a baseline assessment is realistic. The potency of the program is not utilized now. Before the audits are carried out, we need to have a stabilized hospital and department first”.*

Almost a third of the interviewees (31%) described the progress regarding the recommendations from Take Care as ‘work in progress’ and could therefore say nothing about the effects yet. A smaller group (19%) was positive about the effects of Take Care. *“The effects are visible. Most of the recommendations were small, practical things. That is low-hanging fruit and can be implemented within two months”.*

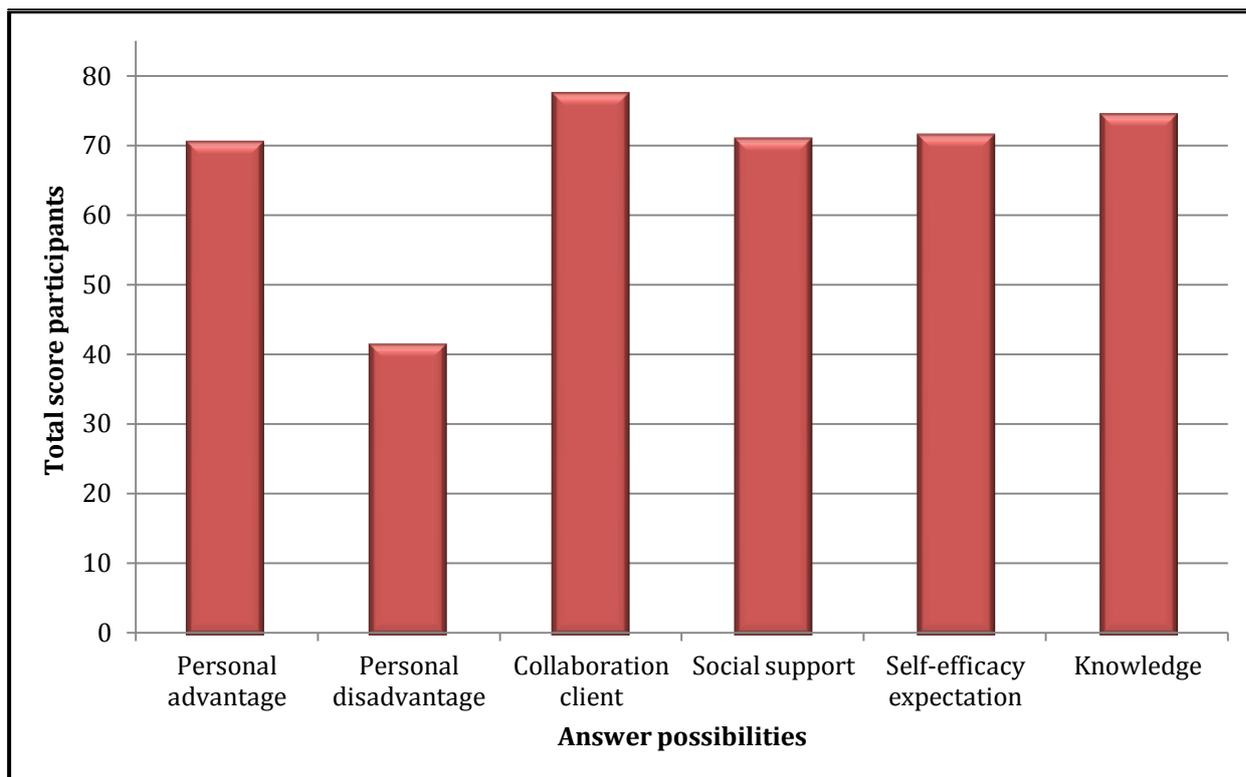
Relevance client: the innovation is suitable for patients

As can be seen in figure 10, this determinant had the highest total score. The determinant also had the highest mean score ( $M = 4.35$ ,  $SD = 0.79$ ). More than half of the interviewees (53%) strongly agreed with the statement that Take Care is suitable for patients. Not one interviewee disagreed. *“Patient participation is an important item when it comes to safety”, a head of department clarified. “The auditors have very specific questions for patients. Stories from patients can sometimes be eye-openers. In advance, it is important to identify which patients are suitable for the interviews. A delirious patient, for example, is unsuitable”.* One interviewee doubted whether interviewing patients had an added value or not.

Medical specialists agreed with the statement that involving patients in internal audits has an added value. *“The patient is key when it comes to patient satisfaction, so it is important to measure the experiences of patients. It is an important indicator of good healthcare”.* *“If you do not take client signals seriously, they may degenerate into complaints”, a board member added.*

### Determinants regarding the user

Figure 11 provides an overview of the total scores of the questions with a five-point Likert scale.



**Figure 11.** Overview scores determinants user with a five-point Likert scale (maximum score = 85)

#### Personal advantage / disadvantage: to what extent does the use of the innovation provide advantages or disadvantages for the department?

In the figure above, it can be seen that the advantages outweigh the disadvantages. This was reflected in the mean scores; the mean score for the advantage was relatively high ( $M = 4.12$ ,  $SD = 0.60$ ) in comparison with that of the disadvantages ( $M = 2.41$ ,  $SD = 0.94$ ). A small group (12%) stated that, in their opinion, the advantages did not outweigh the disadvantages. A nurse clarified. *“It takes quite a lot of time for colleagues participating in the project group. Especially when they are not on their own department for two days”*.

The most frequently heard critical comment referred to *“the agitation that Take Care causes on a department. There is a rather large project team present on the department during the audit. People are walking around on the department, which causes disquiet. For the relevant department this is a great demand”*.

The vast majority (88%) thought otherwise by stating that Take Care mainly provided advantages. *“It is an advantage that colleagues are the auditors. Looking in each other’s kitchen can result in eye-openers, because sometimes you are stuck in certain patterns”*. A board member agreed. *“A strong point from Take Care is the fact that is done peer-to-peer”*. Similar answers were given more often. *“A mirror is hold in front of you by colleagues. The three-dimensional view leads to a beautiful picture of your department”*.

#### Collaboration client: patients will, in general, cooperate when the innovation takes place within the department

The actual use of an innovation is also influenced by the collaboration of the patient. This determinant had a mean score of 4.53 ( $SD = 0.51$ ), the highest among the determinants with a five-point Likert scale. All interviewees believed that patients, in general, will cooperate when

Take Care takes place within a department. *“Patients like to share their experiences, and most patients are willing to express their opinions and comments when they are offered the time and the opportunity. [...] Rather through an interview than on Twitter or Facebook. Prior to the audits, it is important to discuss with the staff on the department which patients are suitable for the interviews. Terminal patients are not suitable, for example”.*

Social support: I can count on sufficient support from my colleagues, if needed, in addressing the recommendations from the innovation

This statement was presented to the interviewees in order to measure the social support. Almost every interviewee (88%) agreed with the statement, resulting a mean score of 4.15 (SD = 0.79). However, one interviewee said *“that there is only support for the recommendations when there is stability. There is no support now, because of the burden of the reshuffling. The recommendations are issues for which I do not have any space and time. Patient care is my number one priority”.*

The ones being more positive stated that *“support depends on whether the recommendations are meaningful or not. [...] As long as the recommendations are understandable and the reason why these recommendations are given is clear”.*

Self-efficacy expectation: if you want to, do you think you will manage to undertake the recommendations from the innovation?

Nearly all interviewees (94%) had a positive self-efficacy expectation. In addition, the mean score was relatively high (M = 4.18, SD = 0.53). According to the interviewees, *“this is due to the fact that the recommendations are very practical. The recommendations are clear and not complex. When it comes to practical matters, these are definitely feasible. As a department, you really can address these matters”.* *“It is possible to address the practical purposes on short notice, the cultural aspect, however, takes more time”*, a colleague added.

Knowledge: I think I have sufficient knowledge to implement the recommendations from the innovation

The most frequently, and usually only, heard answer was *“I think I do”*. This was reflected in the mean score, which was one of the highest within the component regarding the user (M = 4.35, SD = 0.61).

Descriptive norm: how big do you think is the group of colleagues in the department that actually does something with the recommendations of the innovation?

As was mentioned before, the answer possibilities were on a seven-point Likert scale, ranging from ‘no colleague’ to ‘all colleagues’. The mean score of 5.09 (SD = 1.33) indicated that the interviewees believed that a majority of the colleagues actually did something with the recommendations. The estimations differed. *“I think 2/3rd of the people have worked on the improvements”.* *“I think 65 percent”.* *“75 percent”.* *“I think a large part of the colleagues did something with the recommendations”.* *“More than half of my colleagues”.* *“I think 80 – 90 percent”.* *“There is always a small group who believes it is nonsense”*, a nurse said. A small group of interviewees (13%) had much lower estimations. *“I think that eventually around 20 percent really goes through with the recommendations”.*

Information processing: to what extent are you aware of the content of the innovation?

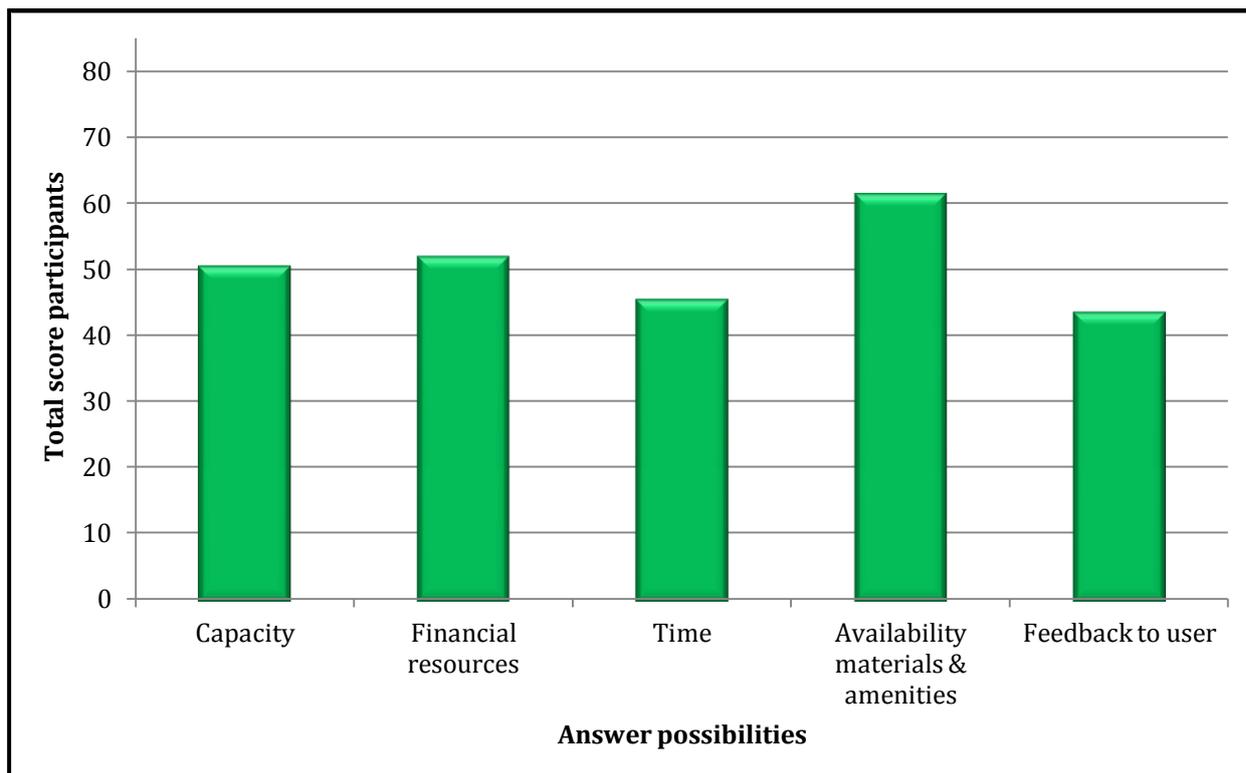
The four-point Likert scale had the answer possibilities ‘I do not know the innovation’, ‘I know the innovation, but have not read it’, ‘I know the innovation and I have read it superficially’ and ‘I know the innovation and I have read it completely and thoroughly’. Nearly all interviewees (94%) stated that they know the program and read it completely and thoroughly. This was also reflected in a high mean score (M = 3.88, SD = 0.49). *“In advance to the audits, they send you a lot of information about the program. I think that you are sufficiently informed about what Take Care*

entails". One interviewee answered that she knew the program, but due to the reshuffling did not read it yet.

The interviewed medical specialists reported that they were not aware of the Take Care program, with the exception of one physician. *"I have seen the audit of the department and discussed it with the care manager. That is all"*. A board member answered that he knew the innovation and had read it superficially.

### Determinants regarding the organization

Figure 12 provides an overview of the total scores of the determinants with a five-point Likert scale.



**Figure 12.** Overview scores determinants organization with a five-point Likert scale (maximum score = 85)

Capacity: there is enough staff in the department to implement the recommendations from the innovation

Nearly half (47%) answered with either 'disagree' or 'strongly disagree', while a smaller group (41%) believed that there is enough personnel. This was also reflected in the mean score, which was 2.94 (SD = 1.30). The ones that disagreed with the statement explained their response. *"Currently, there is a shortage of staff. Therefore, Take Care does not have priority. Patient care should be built up first after the reshuffling, and then you can address the recommendations from Take Care"*.

Those with another opinion stated that *"there is enough space in the personnel to implement the recommendations. When activities cannot be carried out because the staff is too busy with providing care to patients, it is possible that someone is released from care"*. *"More personnel is not always the solution"*, a head of department answered. *"We must stick to the budget, but you can be creative with the use of your services within that budget. As long as you are correct below the line, of course"*.

Medical specialists agreed with the first group. *“There are not enough personnel on the nursing wards, there is a structural deficit. It is nice to improve the safety, but that will cost you staff”*. A board member stated that *“it is important to invest in personnel. You hope that, over the long term, fewer personnel are needed because you work more efficiently. This is the return on investment”*.

#### Financial resources: there are adequate financial resources available to implement the recommendations

As was the case with the previous determinant, there was no unequivocal answer given ( $M = 3.03$ ,  $SD = 1.07$ ). *“I do not have insight into the financial resources”*, was a frequently heard answer. The interviewees that disagreed mainly answered with *“there are none”*. The ones that agreed had a more outspoken opinion. *“You do have room to play with the financial resources, as long as you can underpin why the things you do are better for the purpose of the quality or safety of patient care”*. *“A calamity is more expensive”*, a colleague added.

#### Time: the hospital allows sufficient time to implement the recommendations from the innovation

A coherent factor is time. Of the determinants with a five-point Likert scale, this determinant had the second lowest mean score ( $M = 2.65$ ,  $SD = 1.06$ ). More than half of the interviewed personnel (53%) considered the amount of time to implement the recommendations too low. A nurse explained. *“You have to do everything you want to change in your own time. [...] If I had had more time, the result would have been better. But there is no extra time, because we need the time for our core business: patient care. That must continue”*.

A healthcare coordinator thought otherwise. *“More time is not always the solution, sometimes you just need to do it more convenient. A number of recommendations can simply be done within the existing time”*. *“It depends on the recommendation you want to implement”*, a medical specialist supplemented. *“Some can just save time. You have to do things that are achievable and do not demand an enormous human and financial investment”*.

#### Availability materials and amenities: the hospital provides adequate materials and facilities to implement the recommendations from the innovation

This statement measured the providing of materials and amenities, such as equipment, space or schooling. The majority (65%) agreed, which also can be seen in the mean score. With a score of 3.59 ( $SD = 0.94$ ), this determinant had the highest mean score of the determinants with a five-point Likert scale. *“The past few years, training has been very minimal. That has become much better now. [...] We have gone more towards the teaching hospital, which is a positive thing”*. A medical specialist agreed. *“There is adequate training available”*. A small group (18%) did not agree with the above-mentioned statement. *“I think there are too few hours available for training. I will use a calculation to show you what I mean. Per FTE you get 16 hours of training per year. It has been determined in the training policy that every nurse must go on training two days a year. That is not going to work, since I have more nurses than I have FTEs”*.

#### Feedback to user: in the hospital, regularly feedback takes place on the progress of the implementation of the innovation

This final determinant with a five-point Likert scale had the lowest total score ( $M = 2.53$ ,  $SD = 1.07$ ). Nevertheless, there was a small group of interviewees (18%) that agreed with the statement. *“You are kept informed and they have held a questionnaire to measure our opinion of the program”*. However, the majority (59%) thought otherwise. *“In the beginning there was feedback, but not anymore. With regard to Take Care, we are currently at a standstill. [...] It is a good thing to increase the awareness of the program; it is indeed a good program”*.

According to some interviewees, the heads of department play an important role in the feedback. Another frequently heard answer was the desire to share experiences. *“What I would*

*like to see is a trend analysis of the audits. What common points are encountered? The departments can also learn from each other; where can I get the knowledge I need? [...] As a result, maybe you do not have to reinvent the wheel on your own department”.*

Formal ratification management: at the hospital, are there formal agreements established by the management with regard to the use of the innovation (in policy plans, work plans, etc.)?

The majority of interviewees (71%) answered with ‘yes’. One interviewee gave a negative answer, while the remaining ones (24%) were unfamiliar with the agreement.

Turbulence in the organization: are there, except the innovation, other changes that you encounter now or in the foreseeable future (reorganization, merger, cuts, or other innovations)?

Nearly all interviewees (94%) believed that there was a lot of turbulence. In each interview, the reshuffling in late March this year was mentioned. *“Take Care is pushed aside by the reshuffling. Everyone’s focus is on patient care now, which is our core business. A department is closed; there is a lot uncertainty now”. “It is too early to do the Take Care audits now. Nothing is as frustrating as doing an audit now and being told that you are not doing well on all points. I am aware of that”.*

*“The turbulence is of a consistently high standard”, a medical specialist answered. “On a scale of 1 to 10, I would give the turbulence in this hospital an 8”, a colleague added.*

### **Rounding off/other**

As was already mentioned, after all topics were discussed, the interviewees were asked whether he/she wanted to add something. The additions are cited below.

*“Sometimes I think you’re too abundantly present with Take Care members. In my opinion, we can do the audits with fewer people. Sometimes you are ready done hours before the original end time. That is too bad; someone is not scheduled for patient care that day”.*

*“Take Care is a very comprehensive tool to see where the department is and on which points the department can grow. An area for improvement is the communication. If I work on a department, it is nice to hear something about the recommendations and the improvement plan. In addition, the audits should take place when a department has collaborated for at least six months. Only then you get a good picture of a department”.*

*“A strong point of Take Care is that it is department wide and peer-to-peer. A weaker point is that it is not clear to me what the results actually are and which results are going to be measured to determine the effect of the program”.*

*“If I could fill in the program, I would choose to participate with the nursing care in the department. Now it feels a bit like a check on the nursing care. I think you also get more feeling with the nurses”.*

*“I would like to see more feedback. Not just around the audit and the re-audit days, but also in between. In this way, you keep momentum. That is the role of the head of department; they should be more in charge of the project”.*

*“It is a big shortcoming that the audits are not appreciative anymore. If the audits are done more appreciatively, this may increase the support for the program. It would motivate me to continue my job as an auditor. Now I do not know whether I want to do the audits anymore”.*

*“The report is, in my opinion, the most important and biggest point of improvement. I have experienced this as very disappointing. We cannot do anything with the report we have received. You have to do a re-examination to get things concretely. Then you do research on the occasion of research”.*

*“Regrettably, the Take Care project is very high deployed and people have talked about it a lot, but I miss the profundity. Focusing on the process is an area of improvement. In addition, I also miss a comparison between departments and a linkage with the ongoing projects”.*

## CONCLUSION & DISCUSSION

In this final chapter, the research questions that have been put forward in the introduction are answered. For clarification, this research was a mixed methods approach on the effect and implementation of the Take Care program, an innovative peer-to-peer audit instrument at Gelre Hospitals Apeldoorn. Data was analyzed and interviews were held to answer the two research questions that were formulated. In addition, the strengths and weaknesses of the study design and methods used are described. In the subsequent paragraph, it is described whether the results agree or disagree with other studies and related theories. In conclusion, recommendations with regard to the implementation of Take Care are provided.

### Answering research questions

The purpose of this study was, on the one hand, to examine the effect of the Take Care program on the variables safety culture, pressure ulcers and falls using a mix of retrospective data and face-to-face interviews with board members, medical specialists, heads of departments, healthcare coordinators and nurses. On the other hand, these interviews were used to ask the internal stakeholders what stimulating and obstructing factors are in Gelre Hospitals Apeldoorn for the actual use of the Take Care program. The determinants were incorporated into three different components; the innovation, the user and the organization.

*What is the effect of the Take Care program on the safety culture, pressure ulcers and falls in the clinical departments of Gelre Hospitals Apeldoorn?*

The results indicated that the program did not cause a positive effect on the safety culture perceptions within the departments. With regard to the pressure ulcers, there was no difference between the expected pressure ulcers prevalence in 2012 and January 2013 and the observed prevalence in 2011, indicating no positive effect of Take Care. Finally, the results showed no significant association between several points in time (2011, 2012 and 2013) and the number of falls. This would seem to suggest no effect of Take Care on the number of falls.

*What are stimulating and obstructing factors in Gelre Hospitals Apeldoorn for the actual use of the Take Care program, according to board members, medical specialists, heads of departments, healthcare coordinators and nurses?*

The study results showed that, within the component regarding the innovation, the internal stakeholders found Take Care relevant to patients. This was promoting for the use of the program. Another determinant that had a positive influence on the use was 'correctness', which measured whether the interviewees believed that Take Care was based on factually accurate knowledge. In the same component, the stakeholders concluded unanimously that the visibility of the results of Take Care was an obstructing factor for using the program.

Regarding the component of the user, all determinants had a positive influence on the actual use of Take Care. Within the final component, the organization, the internal stakeholders designated the availability of materials and amenities to implement the recommendations from Take Care as the only stimulating factor. An obstructing factor for the use of the program was 'capacity', which measured whether there was enough staff in the departments to implement the recommendations from Take Care. Moreover, the internal stakeholders were of the opinion that the limited time available to implement the recommendations also was an obstructing factor. Lastly, the absence of regularly feedback on the progress of the implementation of Take Care and the many ongoing changes in the hospital were factors that contributed to a lower use of the program. The results from this study can be used to design specific implementation strategies,

with the objective of increasing the use of and the support for the Take Care program. The ultimate aim is to improve the safety of healthcare with Gelre Hospitals Apeldoorn.

### **Strengths and weaknesses of study design**

Choosing a mix methods research design combined the strengths of quantitative and qualitative research. The mixed methods research tradition is frequently employed by scientists, and they continue to do so in the 21<sup>st</sup> century.<sup>[91, 92]</sup>

Using the MIDI instrument has led to the measurement of determinants that are considered critical for successful use of innovations. Interviews are a suitable way to measure the qualitative aspects of the use.<sup>[84]</sup> The use of semi-structured interviews increased the comparability of responses, since the same questions were answered. Using an audio recorder provided a completely accurate record of what each interviewee said and allowed better eye contact and better rapport. This was confirmed by Kendall et al.<sup>[93]</sup>

Precautions were taken to prevent several types of potential biases, including selection bias. Selection bias is present when the distribution of the interviewees selected by the interviewer differs from that of the population characteristics.<sup>[94]</sup> As was described before, the background characteristics match with that of the personnel in Dutch hospitals. With regard to measurement bias, which occurs when the research design does not match the research question, MIDI was used to shape the research question and the interviews. The interview scheme was designed in such a way that the interviewer's opinion was not displayed during the interview process; this was done to prevent interviewer bias.

Although the research was carefully prepared, there were some limitations and shortcomings. First, there was no control group in the quantitative research. Therefore, it is possible that the results could be caused by confounding variables. Furthermore, the results showed no effect on the variables pressure ulcers and falls. This, however, does not necessarily mean that Take Care is a poor program. This study showed that the absence of positive results may be caused by the implementation of the program. Once the recommendations are implemented, future effect evaluation can demonstrate whether the implementation is responsible for the absence of positive results.

Third, the effect of Take Care on the variable safety culture was measured using one question. The researcher is aware of the fact that this could be better. In future research, the safety culture can be examined extensively. Fourth, a factor that could not be controlled involved the number of possible interviewees that did not participate. 18 of the 42 (43%) invited interviewees refused or did not respond. Maternity leave, long holidays or being too busy were frequently heard reasons. The effect of the nonrespondents and the refusers on the results was probably not noteworthy, since these individuals were relatively evenly distributed over the different types of internal stakeholders.

Fifth, due to the limited amount of time for the interviews, the duration of the interview was determined at half an hour. As a result, not all determinants could be measured. It is possible that important determinants were not incorporated into the interview. Moreover, the staffs' overloaded work, to some extent, might have affected the answers given. The reshuffling had just recently taken place, a department was closed and an unclear summer period was coming up.

Sixth, the interviews with the medical specialists, not familiar with Take Care, were fixed before the actual topic list was determined. Therefore, the questions asked were general questions regarding the implementation of an innovation. In the view of the researcher, this information had a low added value. Finally, an interview is subjective, by definition. Another researcher performing this study might have interrogated differently during the interviews, which could have led to different results.

## Discussion of results

This study agrees with that of Fleuren et al., [72] in which is stated that the introduction of an innovation to healthcare is widely recognized as a complex process. Several stimulating and obstructing factors for the use of an innovation were found during this research. Most of the obstructing determinants did not relate to the innovation itself, but to preconditions. In other studies on innovation implementation, for example Klein and Knight [95], it is concluded that many organizations fail to realize the expected benefit of an innovation due to implementation failure, not innovation failure. Implementation failure is defined as 'the failure to gain targeted employees' skilled, consistent, and committed use of the innovation in question'. Organizational characteristics, such as management support for innovation, financial resource availability and a learning orientation, enhance the likelihood of successful implementation. Others, like Mulgan and Albury [96], enumerated a number of barriers to innovation. No rewards or incentives to innovate or adopt innovations, for example. Or poor skills in active risk or change management, and short-term budgets and planning horizons.

Success factors are also described. According to Leonard [97], there are five critical success factors for innovation adoption in healthcare: (1) amount of resistance to change, (2) amount of training before and during the transition, (3) amount of contribution from stakeholder groups, (4) communication of technology adoption progress, and (5) level of effectiveness in dealing with unplanned events.

With regard to the first research question, it was concluded in this thesis that Take Care did not cause a positive effect on the safety culture perceptions within the departments. Regarding pressure ulcers, the results suggest no effect of Take Care on the prevalence of pressure ulcers. It should be noted that reducing the pressure ulcers was difficult on several departments, since the prevalence was very low within these wards in 2011. Another possible cause, and at the same time weakness, in the data collection were the measurement points. In 2011 and 2012, the prevalence of pressure ulcers was measured over a one year period, while in 2013 only the first month was measured. This some holds for the number of falls, only that in 2013 the first quartile was measured, in stand of one month. A different possible cause could be the fact that Take Care is still under development. This research showed that positive effects may be absent due to the inadequate implementation. This is also the case regarding the falls. The results also suggested no effect of Take Care on the number of falls. Moreover, the data included the total of number of falls in Gelre Hospitals Apeldoorn. A different result might have been possible when the data included only the falls within the nursing wards.

## Recommendations

To achieve a positive effect on safe nursing, the focus should be on the implementation of Take Care first. A considerable body of evidence now exists that indicates which determinants should be addressed to increase the actual use and the support of the Take Care program within Gelre Hospitals Apeldoorn. Based on the results, several recommendations within the components regarding the innovation, the user and the organization are put forward that could accomplish this. The recommendations are described in detail below and displayed in the overview in figure 13. Hopefully, policy makers and project members will translate these recommendations into actions.

### Recommendations regarding the innovation

- This research showed that the completeness of the Take Care program could be improved. A possible solution is to involve the heads of department in the audits. By interviewing the head of department in advance of the audit, it can be tuned which projects are already dealt with. This prevents unnecessary work for the audit team and disappointment for the heads of department. As a result, the perception of the program is more positive.

- Another recommendation regarding the completeness of the innovation is to involve other disciplines in the audit. Asking questions to the physiotherapist or dietician, for example, provides a lot of information about how things are going on a department. Since the nursing process is not an autonomous process is, also specialists and physician assistants should be involved.
- The researcher believes that the perception of the completeness of Take Care can be improved when Take Care, the KPI-rounds and the safety rounds are integrated into one Gelre Hospitals Apeldoorn broad safety program. The KPI-rounds and the safety rounds can function as measurements between the Take Care audit and re-audit to check whether the department is on the right track or not. By integrating the separate safety initiatives into one program, clarity is provided, awareness is increased and the impact is higher.
- Some of the staff experienced the program as complicated, in particular the report. For some interviewees, this is the biggest point of improvement. A possibility to make the experience less complicated might be to use the appreciative inquiry principle in the report. Now, the emphasis is on the things that are going not so good. Furthermore, the vaguenesses in the report should be removed. In the opinion of the researcher, heads of department can only assess how big a problem is when a word such as 'sometimes' is expresses as 'in four of the ten cases'.

#### Recommendations regarding the user

- Although most interviewees gave a positive answer to the question regarding the personal advantage/disadvantage, the researcher is of the opinion that this determinant can even have a better impact on the use of Take Care. The audits can be done with fewer people, for example. First, the relatively large amount of project members on a department gives unrest. You expect a lot of a department. Second, the auditors which do not have to take part in the audits can return to their department to provide patient care that day.
- The same applies to the determinant social support. In the opinion of the researcher, the influence of this determinant can be improved when experiences are shared, for example among heads of department. In a trend analysis or a joint consultation, successes can be celebrated and heads of department can learn from each other. Do others run into the same problems? Where can I get the knowledge I need? As a result, heads of department do not have to reinvent the wheel.

#### Recommendations regarding the organization

- To increase the low mean score of the determinants capacity and time, the researcher has noticed that more capacity and time sometimes is not the solution. A number of recommendations can simply be done within the existing time and capacity. On some departments, the heads of department need help with implementation and visibility of the recommendations of Take Care.
- The feedback to the department can also be improved. During the interviews, the researcher frequently heard that there was little or no feedback to the department about the progress of the innovation, the experiences of other departments and the assurance of the recommendations. A possible solution to this problem is face-to-face exchange, since this is the most effective communication strategy. <sup>[98]</sup> In addition, regular updates on the intranet about the implementation and results of Take Care are, according to the researcher, also a possibility.

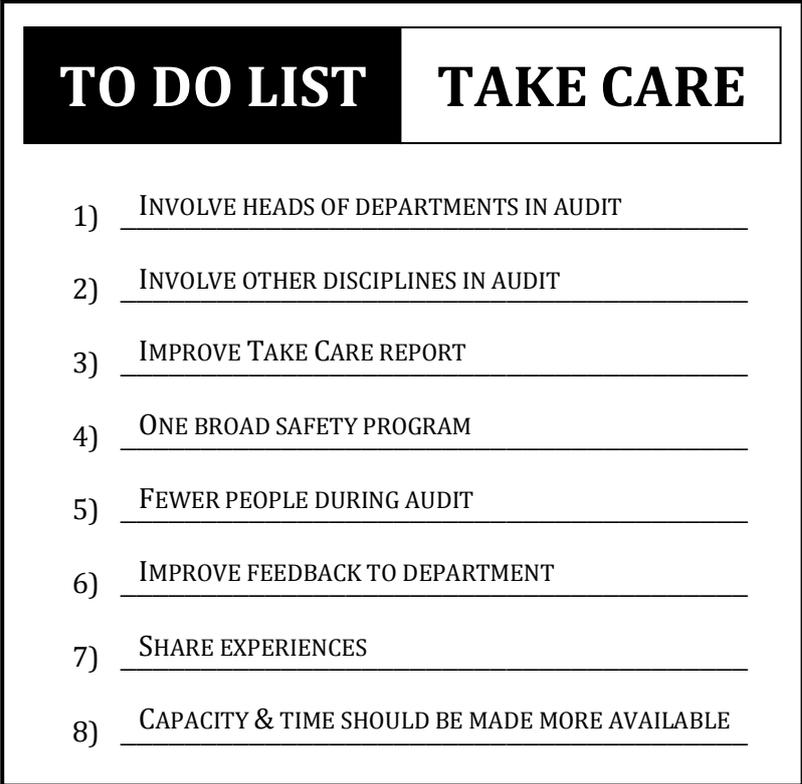


Figure 13. Recommendations implementation Take Care

## LITERATURE

1. Kohn, L.T., J.M. Corrigan, and M.S. Donaldson, *To err is human: building a safer health system*. Vol. 627. 2000: National Academies Press.
2. Amalberti, R., et al., *Five system barriers to achieving ultrasafe health care*. *Annals of internal medicine*, 2005. **142**(9): p. 756-764.
3. Everdingen, J.J.E., et al., *Patient Safety Toolbox: Instruments for improving safety in health care organisations*2007: Bohn Stafleu van Loghum.
4. Wagner, C. and G. Van der Wal, *Voor een goed begrip. Bevordering patiëntveiligheid vraagt om heldere definities [For a good understanding. Improving patient safety requires clear definitions]*. *Med Contact*, 2005. **60**: p. 1888-1891.
5. Healy, J., *Improving health care safety and quality: reluctant regulators*2011: Ashgate Publishing, Ltd.
6. Bellamy, M., F.A. Rozovsky, and J.R. Woods Jr, *The handbook of patient safety compliance: a practical guide for health care organizations*2005: Jossey-Bass.
7. Fairfield, C., *Improving the safety of health care: the leapfrog initiative*. *Eff Clin Pract*, 2000. **6**: p. 313-316.
8. DuPree, E., R. Anderson, and I.S. Nash, *Improving quality in healthcare: start with the patient*. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine*, 2011. **78**(6): p. 813-819.
9. Wollersheim, H., et al., *Kwaliteit en veiligheid in patiëntenzorg*. 2011.
10. Gluck, P.A., *Patient Safety: Some Progress and Many Challenges*. *Obstetrics & Gynecology*, 2012. **120**(5): p. 1149-1159.
11. Krause, T.R. and J. Hidley, *Taking the Lead in Patient Safety: How Healthcare Leaders Influence Behavior and Create Culture*2008: Wiley.
12. Brennan, T.A., et al., *Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I*. *New England journal of medicine*, 1991. **324**(6): p. 370-376.
13. Briant, R., et al., *Representative case series from New Zealand public hospital admissions in 1998—III: adverse events and death*. *Journal of the New Zealand Medical Association*, 2006. **119**(1231).
14. Baker, G.R., et al., *The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada*. *Canadian Medical Association Journal*, 2004. **170**(11): p. 1678-1686.
15. Soop, M., et al., *The incidence of adverse events in Swedish hospitals: a retrospective medical record review study*. *International Journal for Quality in Health Care*, 2009. **21**(4): p. 285-291.
16. Mendes, W., et al., *The assessment of adverse events in hospitals in Brazil*. *International Journal for Quality in Health Care*, 2009. **21**(4): p. 279-284.
17. Aranaz-Andrés, J.M., et al., *Impact and preventability of adverse events in Spanish public hospitals: results of the Spanish National Study of Adverse Events (ENEAS)*. *International Journal for Quality in Health Care*, 2009. **21**(6): p. 408-414.
18. Thomas, E.J., et al., *A comparison of iatrogenic injury studies in Australia and the USA I: context, methods, casemix, population, patient and hospital characteristics*. *International Journal for Quality in Health Care*, 2000. **12**(5): p. 371-378.
19. Zegers, M., et al., *Adverse events and potentially preventable deaths in Dutch hospitals: results of a retrospective patient record review study*. *Quality and Safety in Health Care*, 2009. **18**(4): p. 297-302.
20. de Vries, E.N., et al., *Development and validation of the SURgical Patient Safety System (SURPASS) checklist*. *Quality and Safety in Health Care*, 2009. **18**(2): p. 121-126.
21. Sande, R., et al., *Gestructureerde kortetermijnrisicotaxatie kan de separatietijd bekorten en agressie-incidenten verminderen*. 2009.
22. Sino, C. and A. de Jong, *Medicatie achter de voordeur*. *Onderwijs en gezondheidszorg*, 2010. **34**(3): p. 18-21.
23. Bakkers, M., *Geïnformeerde patiënt reduceert herhaalbezoeken en second opinions*. *Zorg en Financiering*, 2011. **10**(3): p. 20-25.
24. Banta, H.D., *Health care technology and its assessment in eight countries*2004: DIANE Publishing.
25. Donchin, Y., et al., *A look into the nature and causes of human errors in the intensive care unit*. *Critical care medicine*, 1995. **23**(2): p. 294-300.

26. Harrison, B.T., et al., *An analysis of the causes of adverse events from the Quality in Australian Health Care Study*. Med J Aust, 1999. **170**(9): p. 411-415.
27. Benner, P., et al., *Individual, practice, and system causes of errors in nursing: a taxonomy*. Journal of Nursing Administration, 2002. **32**(10): p. 509-523.
28. Balas, M.C., L.D. Scott, and A.E. Rogers, *The prevalence and nature of errors and near errors reported by hospital staff nurses*. Applied nursing research: ANR, 2004. **17**(4): p. 224.
29. Considine, J., *The role of nurses in preventing adverse events related to respiratory dysfunction: literature review*. Journal of advanced nursing, 2005. **49**(6): p. 624-633.
30. Page, A., *Keeping patients safe: Transforming the work environment of nurses* 2004: National Academies Press.
31. Friesen, M.A., M.B. Farquhar, and R. Hughes, *The nurse's role in promoting a culture of patient safety* 2005: Center for American Nurses.
32. Leape, L.L., et al., *Systems analysis of adverse drug events*. JAMA: the journal of the American Medical Association, 1995. **274**(1): p. 35.
33. Morath, J., *Nurses create a culture of patient safety: It takes more than projects*. OJIN: The Online Journal of Issues in Nursing, 2011. **16**(3).
34. Singer, S., et al., *Relationship of safety climate and safety performance in hospitals*. Health services research, 2009. **44**(2p1): p. 399-421.
35. Mardon, R.E., et al., *Exploring relationships between hospital patient safety culture and adverse events*. Journal of patient safety, 2010. **6**(4): p. 226-232.
36. Estabrooks, C.A., et al., *Measuring the hospital practice environment: A Canadian context*. Research in Nursing & Health, 2002. **25**(4): p. 256-268.
37. Sexton, J.B., *A Matter of life or death: Social psychological and organizational factors related to patient outcomes in the intensive care unit*. 2011.
38. Sandars, J. and G. Cook, *ABC of patient safety*. Vol. 72. 2009: BMJ Books.
39. Chen, I., H.F. Ng, and H.H. Li, *A multilevel model of patient safety culture: cross-level relationship between organizational culture and patient safety behavior in Taiwan's hospitals*. The International Journal of Health Planning and Management, 2012. **27**(1): p. e65-e82.
40. Poley, M.J., et al., *Patient safety culture in a Dutch pediatric surgical intensive care unit: an evaluation using the Safety Attitudes Questionnaire*. Pediatric Critical Care Medicine, 2011. **12**(6): p. e310-e316.
41. Campbell, E., *AORN guidance statement: creating a patient safety culture*. AORN J, 2006. **83**: p. 936-42.
42. UKCC, *Code of Professional Conduct*, 1992, UKCC: London.
43. Shekelle, P., et al., *Making Health Care Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices*. Prepared by the Southern California-RAND Evidence-based Practice Center under contract HHS2902007100621.) Rockville, MD: Agency for Healthcare Research and Quality, 2013.
44. Pronovost, P., et al., *An intervention to decrease catheter-related bloodstream infections in the ICU*. New England journal of medicine, 2006. **355**(26): p. 2725-2732.
45. Dixons-Woods, M., et al., *Explaining Michigan: developing an ex post theory of a quality improvement program*. Milbank Quarterly, 2011. **89**(2): p. 167-205.
46. O'Grady, N.P., et al., *Guidelines for the prevention of intravascular catheter-related infections*. Clinical infectious diseases, 2011. **52**(9): p. e162-e193.
47. Saint, S., et al., *Translating health care-associated urinary tract infection prevention research into practice via the bladder bundle*. Joint Commission journal on quality and patient safety/Joint Commission Resources, 2009. **35**(9): p. 449.
48. Foxman, B., *Epidemiology of urinary tract infections: incidence, morbidity, and economic costs*. American Journal of Medicine, 2002. **113**(1): p. 5-13.
49. Umscheid, C.A., et al., *Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs*. Infection control and hospital epidemiology, 2011. **32**(2): p. 101-114.
50. Organization, W.H., *WHO guidelines on hand hygiene in health care: first global patient safety challenge. Clean care is safer care* 2009: World Health Organization.
51. Backman, C., D.E. Zoutman, and P.B. Marck, *An integrative review of the current evidence on the relationship between hand hygiene interventions and the incidence of health care-associated infections*. American journal of infection control, 2008. **36**(5): p. 333.
52. Cameron, I.D., et al., *Interventions for preventing falls in older people in nursing care facilities and hospitals*. Cochrane Database Syst Rev, 2010. **1**.

53. Coussement, J., et al., *Interventions for Preventing Falls in Acute-and Chronic-Care Hospitals: A Systematic Review and Meta-Analysis*. Journal of the American Geriatrics Society, 2008. **56**(1): p. 29-36.
54. Oliver, D., et al., *Strategies to prevent falls and fractures in hospitals and care homes and effect of cognitive impairment: systematic review and meta-analyses*. *bmj*, 2007. **334**(7584): p. 82.
55. Silveira, M.J., S.Y. Kim, and K.M. Langa, *Advance directives and outcomes of surrogate decision making before death*. New England journal of medicine, 2010. **362**(13): p. 1211-1218.
56. Wadey, V. and C. Frank, *The effectiveness of patient verbalization on informed consent*. Canadian journal of surgery. Journal canadien de chirurgie, 1997. **40**(2): p. 124.
57. Meri n, A., et al., *Multidisciplinary team training in a simulation setting for acute obstetric emergencies: a systematic review*. Obstetrics & Gynecology, 2010. **115**(5): p. 1021.
58. Rab l, L.I., D.  stergaard, and T. Mogensen, *Outcomes of classroom-based team training interventions for multiprofessional hospital staff. A systematic review*. Quality and Safety in Health Care, 2010. **19**(6): p. e27-e27.
59. Benson, L., et al., *Using an advanced practice nursing model for a rapid response team*. Joint Commission journal on quality and patient safety/Joint Commission Resources, 2008. **34**(12): p. 743.
60. van der Linden, W., A. Warg, and P. Nordin, *National register study of operating time and outcome in hernia repair*. Archives of Surgery, 2011. **146**(10): p. 1198.
61. Yule, S., *Safety culture and safety climate: A review of the literature*. Industrial Psychology Research Centre, 2003: p. 1-26.
62. Sammer, C.E., et al., *What is patient safety culture? A review of the literature*. Journal of Nursing Scholarship, 2010. **42**(2): p. 156-165.
63. Guldenmund, F.W., *The nature of safety culture: a review of theory and research*. Safety science, 2000. **34**(1): p. 215-257.
64. Cooperrider, D., D.D. Whitney, and J. Stavros, *The appreciative inquiry handbook: For leaders of change*2008: Berrett-Koehler Publishers.
65. Hammond, S. and F.O.W. Works, *Thin Book of Appreciative Inquiry (Thin Book Series)*1998: Thin book publishing company.
66. Jamtvedt, G., et al., *Audit and feedback: effects on professional practice and health care outcomes*. 2010.
67. Bloom, B.S., *Effects of continuing medical education on improving physician clinical care and patient health: a review of systematic reviews*. International journal of technology assessment in health care, 2005. **21**(3): p. 380-385.
68. Struben, V. and C. Wagner, *Ontwikkeling van een Instrument voor Zelf Evaluatie van de Pati ntveiligheidscultuur (IZEP)*. 2006.
69. Parker, D. and P. Hudson, *Understanding your culture*. Manchester: Shell International Exploration and Production, 2001.
70. Teigland, C., et al., *Clinical informatics and its usefulness for assessing risk and preventing falls and pressure ulcers in nursing home environments*, 2005, DTIC Document.
71. Rogers Everett, M., *Diffusion of innovations*. New York, 1995.
72. Fleuren, M., K. Wiefferink, and T. Paulussen, *Determinants of innovation within health care organizations Literature review and Delphi study*. International journal for quality in health care, 2004. **16**(2): p. 107-123.
73. Paulussen, T.G.W., *Adoption and implementation of AIDS education in Dutch secondary schools*. 1994.
74. Fleuren, M., et al., *Meetinstrument voor Determinanten van Innovaties (MIDI)*, 2012, TNO.
75. Clara Cohen, M.O., and Deepali Patel, *Design Considerations for Evaluating the Impact of PEPFAR: Workshop Summary*2008: The National Academies Press.
76. Spector, P.E., *Research designs*1981: SAGE Publications, Incorporated.
77. Bergstrom, N., *Treatment of pressure ulcers: clinical practice guideline*1994: DIANE Publishing.
78. Bennett, G., C. Dealey, and J. Posnett, *The cost of pressure ulcers in the UK*. Age and ageing, 2004. **33**(3): p. 230-235.
79. Masud, T. and R.O. Morris, *Epidemiology of falls*. Age and ageing, 2001. **30**(suppl 4): p. 3-7.
80. Close, J., et al., *Prevention of falls in the elderly trial (PROFET): a randomised controlled trial*. Lancet, 1999. **353**(9147): p. 93-97.
81. Hughes, R.G., *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*2008, Rockville (MD): Agency for Healthcare Research and Quality.

82. Montalvo, I., *The National Database of Nursing Quality Indicators™ (NDNQI®)*. Online J Issues Nurs, 2007. **12**(3).
83. Baarda, D.B., M.P.M. Goede, and A. Van der Meer-Middelburg, *Basisboek interviewen: handleiding voor het voorbereiden en afnemen van interviews*2007: Wolters Noordhoff.
84. Goodwin, C.J., *Research in psychology: Methods and design*2009: Wiley.
85. Oppenheim, A.N., *Questionnaire design, interviewing and attitude measurement*2000: Continuum.
86. Wydooghe, B., *SADAN Informatiesysteem. Sociaal-Agogische Digitale en Analoge Naslag. Boek III: Spell! Schrijf-en oefenboek*2005: Garant.
87. Baarda, D., M. De Goede, and J. Teunissen, *Basisboek kwalitatief onderzoek. Handleiding voor het opzetten en uitvoeren van kwalitatief onderzoek*2005, Groningen: Wolters Noordhoff.
88. Babbie, E.R., *The practice of social research*2012: Wadsworth Publishing Company.
89. DHD, *Kerngetallen Nederlandse Ziekenhuizen*, 2013, Dutch Hospital Data: Utrecht.
90. de Visser, S. and F. Schoenmakers, *Werknemersenquête Zorg en WJK 2011*, in *Onderzoeksprogramma Arbeidsmarkt Zorg en WJK*2012, Panteia: Zoetermeer.
91. Brewer, J. and A. Hunter, *Foundations of multimethod research: Synthesizing styles*2006: SAGE Publications, Incorporated.
92. Maxwell, J.A. and D.M. Loomis, *Mixed methods design: An alternative approach*. Handbook of mixed methods in social and behavioral research, 2003. **1**: p. 241-272.
93. Kendall, K.E., et al., *Systems analysis and design*1992: Prentice Hall Englewood Cliffs.
94. Ferber, R. and H.G. Wales, *Detection and correction of interviewer bias*. Public Opinion Quarterly, 1952. **16**(1): p. 107-127.
95. Klein, K.J. and A.P. Knight, *Innovation implementation overcoming the challenge*. Current Directions in Psychological Science, 2005. **14**(5): p. 243-246.
96. Mulgan, G. and D. Albury, *Innovation in the public sector*. Strategy Unit, Cabinet Office, 2003.
97. Leonard, K.J., *Critical success factors relating to healthcare's adoption of new technology: a guide to increasing the likelihood of successful implementation*. Electronic Healthcare, 2004. **2**(4): p. 72-81.
98. Sanson-Fisher, R.W., *Diffusion of innovation theory for clinical change*. Medical journal of Australia, 2004. **180**(6): p. S55.

# **ANNEXES**

## **Content**

- I. Content four components of Take Care**
- II. Interview scheme**

## I. Content four components of Take Care

### PATIENT RECORDS

*Are the appropriate forms used the right way?*

<b>Nursing record</b>		
Nursing anamnesis	Yes/No	
Risk list	Yes/No	
Arrangement sheet	Yes/No	
Additional info	Yes/No	
Nursing care plan	Yes/No	
Reporting	Yes/No	
Pressure ulcer risk score	Yes/No	Not applicable
Wound anamnesis	Yes/No	Not applicable
Wound treatment	Yes/No	Not applicable
Internal nursing transfer	Yes/No	Not applicable
Checklist discharge	Yes/No	
Medical treatment code is mentioned in the file, clearly visible and up-to-date	Yes/No	
<b>In medical record</b>		
Paramedical order form (are all orders listed according to the guideline)	Yes/No	
Medical treatment code form	Yes/No	
<b>At the bed of the patient or in medical record</b>		
Moisture balance/measurement list	Yes/No	
Temperature list	Yes/No	
<b>All subjects of the risk list are, if necessary, processed into the file in interventions, observations and activities</b>		
attn. MRSA	Yes/No	Not applicable
attn. Nutrition	Yes/No	Not applicable
attn. Delirium	Yes/No	Not applicable
attn. Falling	Yes/No	Not applicable
attn. Katz/ADL	Yes/No	Not applicable
attn. Pressure ulcer	Yes/No	Not applicable
<b>Orders</b>		
All orders from the medical and nursing record are fully processed in the record	Yes/No	
If not, estimate the percentage conducted according to prevailing agreement	%	

All activities and intervention in the record are based on orders or protocol	Yes/No	
If not, estimate the percentage conducted according to prevailing agreement	%	
<b>Examination and treatments</b>		
In the file, it is described that the patient is informed	Scale	Very bad - very good
In the file, it is recorded that the information has been understood	Scale	Very bad - very good
It is clear that resulting actions are performed/planned	Yes/No	
If another caregiver than the main practitioner takes over (a part of the) treatment, this is mentioned in the record	Yes/No	Not applicable
<b>Reporting and nursing care plan</b>		
To what degree is the reporting understandable to you?	Scale	Very bad - very good
The reporting is consistent with the crosses plan and the order sheet	Scale	Very bad - very good
The reporting is for one explanation susceptible	Scale	Very bad - very good
<b>SURPASS</b>		
The checklist is fully completed and signed	Yes/No	Not applicable
<b>Discharge</b>		
Is the discharge date known	Yes/No	
Is the discharge date pre-announced at least 24 hours before discharge	Yes/No	
Checklist is completed at discharge	Yes/No	Not applicable
<b>Pain registration</b>		
Pain registration form in the is present in the medication register	Yes/No	
Pain is asked and registered 4 times per day and if pain score >4 measures have been taken	Yes/No	
If not, estimate the percentage conducted according to prevailing agreement	%	

PATIENT INTERVIEWS

<b>General</b>					
Gelre Hospitals would like to be a safe hospital. What is your sense of safety in this hospital, expressed with a grade from 1 till 10?	1 - 10				
Can you give an example of a situation in which you did not feel safe?	Free text				
If you have a complaint, would you discuss it with your doctor or nurse?	Yes/No				
On a scale from 1 till 10, to what extent are you involved with the course of events surrounding your treatment?	1 - 10				
Is it prompted if you want to be resuscitated in critical situations or if you want to undergo certain treatments or not?	Yes/No				
How would you rate the treatment in the hospital?	1 - 10				
Do you know who the ward doctor is?	Yes/No				Not applicable
Do you know who your attending specialist is?	Yes/No				
If another caregiver than the main practitioner has taken over (a part of the) treatment, you were informed about this timely and clearly	Yes/No				Not applicable
Do you have tips and/or advices for the nurses or other caregivers?	Free text				
<b>On the occasion of the patient record</b>					
<i>if applicable</i>					
attn. MRSA, are you informed about this and is everything clear?	Yes/No				Not applicable
did you receive the folder?	Yes/No				
attn. Nutrition, are you informed about this and is everything clear?	Yes/No				Not applicable
did you receive the folder?	Yes/No				
attn. Delirium, are you informed about this and is everything clear?	Yes/No				Not applicable
did you receive the folder?	Yes/No				
attn. Falling, are you informed about this and is everything clear?	Yes/No				Not applicable
did you receive the folder?	Yes/No				
attn. Pressure ulcer, are you informed about this and is everything clear?	Yes/No				Not applicable
did you receive the folder?	Yes/No				
<b>Physical examinations</b>					
Can you indicate how you think you have been informed about the upcoming researches and treatments?	Scale	Very good	Sufficient	Moderate	Poor
Can you indicate if you are informed betimes about the researches and treatments?	Scale	Very good	Sufficient	Moderate	Poor
Did you receive written information about the research?	Yes/No	Not applicable			
If you would have to rate this information, how would you grade it?	Scale	Very good	Sufficient	Moderate	Poor

<b>ADL</b>					
To what extent is the ADL support you receive determined in consultation with you?	Scale	Not applicable			
		Very good	Sufficient	Moderate	Poor
Can you indicate to what extent the determined support matches with your expectations	Scale	Not applicable			
		Very good	Sufficient	Moderate	Poor
<b>Information alignment</b>					
To what extent is the information you have received from different caregivers unambiguous?	Scale	Very good	Sufficient	Moderate	Poor
Do you have tips and/or advices how we can improve this?	Free text				
<b>Medication</b>					
Is it explained to you why you have to take your medication?	Scale	Very good	Sufficient	Moderate	Poor
If, for some reason, you are not allowed to take your medication, has it been explained why?	Scale	Very good	Sufficient	Moderate	Poor
Do you get the (right) medication at the appointed time?	Scale	Very good	Sufficient	Moderate	Poor
<b>Discharge</b>					
Do you already know when you are going home?	Yes/No				
Are the agreements surrounding your discharge sufficiently clear?	Scale	Not applicable			
		Very good	Sufficient	Moderate	Poor
Do these agreements match with your expectations?	Scale	Not applicable			
		Very good	Sufficient	Moderate	Poor

NURSE INTERVIEWS

<b>General</b>							
What do you think is going well in the department (top 3)	List	Atmosphere	Collaboration	Expertise	Other, namely		
What do you think can improve (top 3)	List	Staff commitment	Doctors	Nurse guidance	Less paperwork	More computers	Other, namely
If you have to give your department a grade with regard to patient safety, what would that grade be:	1 - 10						
During office hours	1 - 10						
Outside office hours	1 - 10						
There are agreements that sufficient professional expertise and skills is available 24/7 to give form and substance to the care processes responsibly	Scale	Very good	Sufficient	Moderate	Poor		
How safe do you feel to speak freely in all situations with other caregivers?	1 - 10						
<b>Rounds</b>							
What is your role during the rounds?	List	Supportive	Initiating	Steering	Other, namely		
Do you feel that you have sufficient input during the rounds?	1 - 10						
What do you think is the most important criteria for doing rounds?	List	Knowledge	Experience	Insight	Preponderance	Other, namely	
To what extent do you meet these criteria?	1 - 10						
How is checked whether the formulated policy with regard to nursing and medical records matches with each other?	List	Not	If something is not clear	Always after the rounds	Other, namely		
What can be done differently in the rounds?	Free text						
<b>Discus, further to records</b>							
Is the record used according to the arrangements?	1 - 10						
Discussing notable observations, focus on safety issues	Free text						
<b>EWS</b>							
Do the doctors adequately respond to the EWS alerts?	1 - 10						
<b>Performing orders</b>							
How do you record a verbal or telephone order given outside the rounds?	List	Not	Nursing arrangement sheet	Nursing report	Medical arrangement sheet	Medical decursus	Other, namely
How do you record that the order has been carried out?	List	Not	Nursing arrangement sheet	Nursing report	Medical arrangement sheet	Medical decursus	Other, namely

<b>Discharge policy</b>							
Can you estimate the percentage of patients in whom at least 24 hours before the discharge is determined	%						
The criteria on which the discharge is determined are sufficiently clear	1 - 10						
<b>High Risk medication</b>							
Do you the VTGM protocol?	Yes/No						
Does your colleague, in controlling a solution, do the new calculation them self?	Yes/No						
Does a colleague of yours check the pump mode while attaching the medication?	Yes/No						
<b>MDO</b>							
Is the MDO prepared?	Yes/No						
If so, how does this take place?	Free text						
Who leads the MDO?	List	Specialist	Physician assistant	Care coordinator	Nurse	Other, namely	
Can you indicate what the value of the MDO is for you:							
At process level	1 - 10						
At outcome level	1 - 10						

OBSERVATIONS PATIENT VISITS AND MEETINGS

<b>Medication</b>					
What is the contribution of the nurse?	Scale	Very good	Sufficient	Moderate	Poor
Nurse has visibly the overview on the situation of the patient	Scale	Very good	Sufficient	Moderate	Poor
The rounds is disturbed several times	Scale	Very good	Sufficient	Moderate	Poor
The patient receives clear, unambiguous information about the policy	Scale	Very good	Sufficient	Moderate	Poor
Doctor or nurse asks the patient if he/she has understood the information	Scale	Very good	Sufficient	Moderate	Poor
<b>MDO (if observed)</b>					
There is a clear division of roles	Scale	Very good	Sufficient	Moderate	Poor
Are all participants addressed?	Scale	Very good	Sufficient	Moderate	Poor
What are the participating disciplines	Free text				
How are patients that will be discussed prepared	Scale	Very good	Sufficient	Moderate	Poor
<b>Answer bell</b>					
To an emergency signal is responded immediately	Yes/No	Not applicable			
The bell is answered within 3 minutes	Yes/No				
<b>General</b>					
Isolation and infection control policy is conducted according to protocol	Yes/No				
<b>Behavior</b>					
Nurses give each other feedback on their actions	Scale	Very good	Sufficient	Moderate	Poor
There is a fast and adequate response to questions from patients or family	Scale	Very good	Sufficient	Moderate	Poor
General rules of etiquette are respected	Scale	Very good	Sufficient	Moderate	Poor
Nurses do not speak about patients, but with patients	Scale	Very good	Sufficient	Moderate	Poor
Nurse is recognizable for the patient	Yes/No				
There are agreements on the division of tasks, responsibilities and competences between different professional disciplines involved in the same processes and these agreements are communicated with those directly involved	Scale	Very good	Sufficient	Moderate	Poor
<b>Share medication</b>					
Medication is shared according to the protocol	Yes/No				
Through the organization of the medication sharing, the number of disruptions limited to a minimum	Scale	Very good	Sufficient	Moderate	Poor
Medication changes are explained to the patient	Scale	Very good	Sufficient	Moderate	Poor
<b>General: central indexes</b>					
At the secretariat, a SAP screen is available with the current patient overview	Yes/No				
INR-form	Yes/No				
Blood glucose form	Yes/No				

## II. Interview scheme

### Introduce oneself

- Introduce yourself
- Put respondent at ease (talk about weather, office, etc)
- Ask approval audio recorder
- Set recorder

### Introduction

- Where is the interview about (exemplify research)
- Explain what will happen with the data

#### Int: READ ALOUD / PARAPHRASE

*"Before we start with the interview, I first want to tell you once again where this interview is about. I want to talk to you about the implementation of the Take Care program. The interview will contribute to my research, on behalf of Bert Kleinlugtenbeld, to which determinants influence the use of an innovation. The point is that you give your own opinion on these matters as much as possible, there are no 'right' or 'wrong' answers.*

*I will be using an audio recorder to record the interview, so that I can listen and process the information later on. During the interview, I will occasionally make notes to retain the main outline. Afterward, the interview is processed into a text file. Your name will not be mentioned herein. Furthermore, no one else but me has access to the data.*

*Before we start with the actual interview, I would like to ask you a couple of questions with regard to your personal information. Do you have any questions so far?"*

### Personal information

#### Int: READ ALOUD / PARAPHRASE

*"Do you want to answer the following questions briefly?"*

*What is your age?*

*Which studies did you attend?*

*Can you tell something about your working experience briefly?*

### The interview

#### Int: READ ALOUD / PARAPHRASE

*"Thank you for answering these questions. I want to continue with the interview now. The questions asked relate to determinants with regard to the innovations, the user and the organisation that influence the actual use of an innovation, like Take Care. The structure of the request is as follows: I submit a statement, you give your opinion on this statement, and I ask you to explain your answer. We start with determinants concerning the innovation. I would like to emphasize again that there are no 'right' or 'wrong' answers."*

### Determinants regarding the innovation

*Take Care is based on factually accurate knowledge*

Strongly disagree

o

o

o

o

o

Strongly agree

Notes

*I believe that Take Care measures all aspects of the nursing process*

Strongly disagree                      0        0        0        0        0                      Strongly agree

Notes

*Take Care is experienced by the staff as complicated*

Strongly disagree                      0        0        0        0        0                      Strongly agree

Notes

*The program fits well with how the hospital is accustomed to work*

Strongly disagree                      0        0        0        0        0                      Strongly agree

Notes

*I think that the impact of the use of Take Care is clearly visible*

Strongly disagree                      0        0        0        0        0                      Strongly agree

Notes

*I think that the innovation is suitable for patients*

Strongly disagree                      0        0        0        0        0                      Strongly agree

Notes

**Determinants regarding the user**

Int: READ ALOUD / PARAPHRASE

*"The next questions relate to the user."*

<i>To what extent does the use of Take Care provide advantages or disadvantages for the department?</i>							
Strongly disagree	0	0	0	0	0	Strongly agree	<u>Advantage</u>
Strongly agree	0	0	0	0	0	Strongly disagree	<u>Disadvantage</u>

Notes

<i>I think that the objective of the program is achieved within the department: to improve the safety culture</i>							
Strongly disagree	0	0	0	0	0	Strongly agree	

Notes

<i>Patients will in general cooperate when Take Care takes place within the department</i>							
Strongly disagree	0	0	0	0	0	Strongly agree	

Notes

<i>I can count on sufficient support from my colleagues, if needed, in addressing the recommendations from Take Care</i>							
Strongly disagree	0	0	0	0	0	Strongly agree	

Notes

<i>How big do you think is the group of colleagues in the department that actually does something with the recommendations of Take Care?</i>								
No colleagues	0	0	0	0	0	0	0	All colleagues

Notes



<i>The hospital allows sufficient time to implement the recommendations from Take Care</i>						
Strongly disagree	<input type="radio"/>	Strongly agree				

Notes

<i>The hospital provides adequate materials and facilities to implement the recommendations from the Take Care program</i>						
Strongly disagree	<input type="radio"/>	Strongly agree				

Notes

<i>Are there, except Take Care, other changes that you encounter now or in the foreseeable future (reorganization, merger, cuts, other innovations)?</i>						
	No	<input type="radio"/>	<input type="radio"/>	Yes		

<i>In the hospital, regularly feedback takes place on the progress of the implementation of Take Care</i>						
Strongly disagree	<input type="radio"/>	Strongly agree				

Notes

**Rounding off**Int: READ ALOUD / PARAPHRASE

*"I have come to the end of my interview. I have no further questions. Are there from your side still topics that you want to discuss and that I did not asked? "*

.....

*"Then I would like to thank you for participating in this interview."*