Part two:

Risks and interventions for older hip fracture patients
Chapter 4:
An exploration of the risks for older hip fracture patients

This chapter was adapted from the following report (in Dutch):

Older hip fracture patients are a vulnerable patient group and the care chain they go through includes many risks that can result in suboptimal outcomes for patients. A survey amongst care providers involved in this care chain was conducted to get insight into the risks and where in the care chain they occur from a broad perspective. The results show that complications are the main risk for suboptimal outcomes according to the care providers. These complications include problems such as delirium and wound infection. Also, risks related to the organisation of care were mentioned, such as a delayed operation and the unavailability of rehabilitation options for patients. The results suggest that improvements are possible within the care chain and that they, in addition to the care provision itself, should also focus on the organisation of care for this vulnerable patient group.
INTRODUCTION

It is expected that the incidence of hip fractures will increase in the coming years due to the ageing populations in many Western countries [1,2]. Hip fracture patients face a surgical procedure and long postoperative rehabilitation period, with often disappointing results [3]. Studies have shown that hip fractures have a negative effect on health-related quality of life and activities of daily living [4,5]. It is known that hip fracture patients are a difficult group to manage clinically; these patients are usually of high age and have a variety of comorbidities under varying levels of control, which is associated with an increased risk of rehospitalisation and mortality [6]. To illustrate, a recent retrospective study showed a 8.4% 30-day readmission rate among patients who underwent hip fracture surgery [7]. Reasons for readmission related to the surgical procedure included wound complications, peri-prosthetic fractures and prosthetic dislocations. The majority of patients was readmitted for medical reasons, such as sepsis, pneumonia and urinary tract infection [7].

The care chain for hip fracture patients in the Netherlands includes several steps [8,9]. Usually hip fracture patients arrive at the emergency department (ED) by ambulance. At the ED, the patient’s history in general and in relation to the complaint will be taken. There will also be a physical examination to check on pain, the leg position and the (in)ability to move. Additional examination includes imaging of the pelvis and the affected hip. After this, the fracture-type can be determined and classified, after which options for treatment will be considered. Usually, this involves surgical repair of the fracture, preferably within 24 hours after admission. After the operation, the patient is usually admitted to the surgical or orthopaedics ward and will stay there until they are ready for discharge back to home or to a rehabilitation or assisted living facility [8,9]. The mean length of stay in 2011 was 10 days in the Netherlands [10].

There are many risks involved in this care chain and they can have associated negative outcomes for hip fracture patients. In this study we use the definition of risk as described by the International Risk Governance Council in their report on the International Risk Governance Framework [11, page 4]. A risk refers to “an uncertain (generally adverse) consequence of an event or activity with respect to something that human beings value. [...]” In order to investigate the potential risks for this patient group we conducted a risk inventory amongst care providers involved in the care process for older hip fracture patients. In this inventory the main focus was not primarily on the surgical procedure itself, but more on the risks that may occur in the complete care chain that older hip fracture patients go through. More specifically, the aim was to get insight into types of risks and where they occur in the care chain. These risks are difficult to uncover with retrospective record review studies because they
are often restricted to in-hospital care and focus on undesired outcomes instead of the risks that may lead to these outcomes. In the current study we aim to identify risks related to the surgical procedure and the care provided at the ward. The risk inventory also includes potential risks before and after the hospital admission, risks related to the transfers of the patient and risks related to failures in communication and handovers. The central question for this study is: how do different care providers perceive the risks in the care chain for older hip fracture patients?

METHODS
A short questionnaire was developed and sent to various care providers between June and October 2009. These care providers included: ward nurses (surgical wards), general practitioners, nursing home physicians, physical therapists, nursing home attendants, hospital dieticians and paramedics. They were asked to name five risks or high-risk situations in the care process for hip fracture patients. The risks were then classified into the different phases of the care chain for older hip fracture patients. The phases were based on the Dutch guidelines for hip fracture treatment and include: transfer to the hospital, admission and pre-operative phase, the surgical procedure, post-operative phase, discharge and rehabilitation [8]. The classification of the risks into the phases was done independently by two researchers. Differences in classifications were discussed until consensus was reached.

Table 1 gives an overview of the types of care providers who were involved in this study, how they were approached and how many risk inventories were received from the different care providers.
Table 1: Care providers, method of approach and number of risk inventories

<table>
<thead>
<tr>
<th>Type of care provider</th>
<th>Were approached through</th>
<th>Questionnaires received (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>Participating surgical departments, questionnaires were distributed amongst ten nurses of each department by the head nurse</td>
<td>30 (from 3 departments)</td>
</tr>
<tr>
<td>General practitioner</td>
<td>Sending a questionnaire by mail to general practices in surrounding areas of participating hospitals</td>
<td>6 (out of 30)</td>
</tr>
<tr>
<td>Nursing home physician</td>
<td>Sending a questionnaire by mail to nursing homes in surrounding areas of participating hospitals</td>
<td>5 (out of 12)</td>
</tr>
<tr>
<td>Physical therapists</td>
<td>Participating surgical departments</td>
<td>8 (from 3 departments)</td>
</tr>
<tr>
<td>Nursing home attendant</td>
<td>Sending a questionnaire by mail to nursing homes in surrounding areas of participating hospitals</td>
<td>3 (out of 12)</td>
</tr>
<tr>
<td>Dietician</td>
<td>Participating surgical departments</td>
<td>1 (from 3 departments)</td>
</tr>
<tr>
<td>Paramedic</td>
<td>Sending a questionnaire by mail to paramedic posts in surrounding areas of participating hospitals</td>
<td>2 (from 3 paramedic posts)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>55</td>
</tr>
</tbody>
</table>

**RESULTS**

Figure 1 provides an overview of the risks mentioned by the care providers and classified into the phases of the care chain. It shows that the care providers identified many risks for the post-operative phase of the admission; the time-period between the operation and discharge. Complications such as delirium, wound infections, pneumonia and pressure wounds were mentioned 51 times. Risks were also identified for the other phases of the process, these will be described briefly.

**Transfer to the hospital**

The transfer by ambulance was identified as a risk for vulnerable older hip fracture patients (N=4). Risks related to information and communication were also mentioned (N=3).

**Admission and pre-operative**

Waiting times between admission and the operation were mentioned as a risk for this patient group (N=10). Since hip-fracture surgeries mostly do not get an urgent status, it can happen that patients have to wait a relatively long time because of delays due to urgent operations. This means that the older hip fracture patient is not allowed to eat for a longer time period, which can be harmful since they may already be in a state of malnutrition (N=4). In addition, patients usually experience a lot of pain, which is not always managed adequately according to the care providers (N=4).
Chapter 4

**Operation**

There is not much consensus between the care providers on the risks during the operation. All risks are mentioned only once and relate, for example, to the choice of materials used during the operation and inadequately performed operations.

**Post-operative phase**

Complications are the most often mentioned risks for the post-operative phase (N=51). A second risk is the mobilisation of the patient as soon as possible after the operation (N=24). This includes the risk of the mobilisation exercises together with the physical therapist, but also the exercises the patient has to do alone. It was mentioned that, on some occasions, mobilisation starts too early in the process leading to overestimation by the patient on the possibilities, resulting in overburden. On the other side, the care providers also mention that for some patients mobilisation is started too late or incorrect, for example due to staff shortages. This increases the risk for other complications such as pressure wounds because the patient has to stay in bed.

**Discharge**

Waiting times for rehabilitation and home care are an important risk during the discharge phase (N=4). This often means that patients have to remain admitted to the hospital department. Since the hospital department is not equipped for providing rehabilitation care, this is seen a risk for patients. It is often not possible to provide them with the necessary time, knowledge and attention for the optimal rehabilitation process.

**Rehabilitation**

During the rehabilitation period, either in a rehabilitation centre or at home, the mobility of the patient is considered an important risk (N=7). Examples of the risks related to this are going out of bed at night, using the toilet and the patient washing and clothing himself. In addition, factors in the environment of the patient are mentioned, such as dangerous obstacles (N=5).

**Risks exceeding individual phases and professions**

Some of the risks mentioned by the care providers could not be categorised into one of the specific phases of the care chain. However, they play an important role in the complete process and include patient characteristics (N=10), such as age, dementia and malnutrition of the patient in general (N=5). In addition, transfers between departments (N=2) and insufficient coordination (N=1) are mentioned as a risk exceeding the individual professions.
Figure 1: Risks for the different phases of the care process

- **Risks exceeding individual phases**
  - Patient characteristics in general (10)*
  - Osteoporosis (2)
  - Poor (nutritional) status patient (5)
  - Pain/pain management (2)
  - Physical problems patient (5)
  - Polypharmacy/benzodiazepines (2)
  - Drinking/eating, dehydration (3)
  - Other (3)

- **Phases related to hospital admission**
  - **Transfer to hospital**
    - Transfer home-hospital (4)
    - Information and communication (3)
    - Other (3)
  - **Admission and pre-operative**
    - Delay/waiting for operation (10)
    - Insufficient pain management (4)
    - Other (3)
  - **Operation**
    - Operation itself (1)
    - Operating table in relation to pressure ulcers (1)
    - Choice of material (1)
    - Comorbidity in relation to operation (1)
    - Operation day (1)
    - Infection during operation (1)
    - Operation technically inadequate (1)
  - **Post-operative**
    - Complications (51)
    - Mobilisation within hospital (24)
    - Nursing/caring for patient (8)
    - Falls (8)
  - **Discharge**
    - Long waiting times for rehabilitation (4)
    - Going home without home care (2)
    - Discharge without preparations (2)
    - Transfer to other care facility or department (2)
    - Discharge preparations/transfer (2)
    - Other (8)

- **Rehabilitation**
  - Mobility (7)
  - Falling material and obstacles (5)
  - Transfers (4)
  - Insufficient supervision (2)
  - Insufficient support due to budget cuts (2)
  - Not enough physical therapy during rehabilitation (2)
  - Rehabilitation at home (2)
  - Insufficient knowledge (2)
  - Other (5)

- **Risks exceeding professions**
  - Transfer to other departments within health care institution (2)
  - Shortcomings in coordination between professions in how to approach the patient (1)
  - Insufficient consultation of primary care during admission and discharge (1)

*Number of care providers mentioning this risk*
DISCUSSION

A risk inventory amongst several types of care providers involved in the care chain of older hip fracture patients revealed a variety of risks for the different phases of care. By classifying the risks into the different phases of the care process, it becomes evident that most risks are identified for the period following the operation, while patients are still admitted to the hospital. Especially complications such as pressure wounds, delirium, pneumonia and wound infections were prominently represented. This provides insight into the moments during which older hip fracture patients are at a higher risk for potential negative outcomes.

Other studies looking at risks for hip fracture patients revealed similar findings. A large retrospective record review study among 616 hip fracture patients showed that 43% of these patients experienced at least one complication [12]. Amongst the most occurring complications were delirium, heart failure, urinary tract infection, pneumonia and wound infection. A large-scale quantitative study looking into adverse events in orthopaedic procedures also found high adverse event and complication rates in hip fracture patients [13].

A recent qualitative study on threats to safe hospital discharge included hip fracture patients as a patient group to study complex care transitions [14]. This study classified the threats into three categories and also found that complications were an important threat to patients. The categories of threats in this study were: (1) direct patient harms such as falls and infections, (2) contributing factors such as the assessment of patients at discharge and follow-up care and (3) latent factors such as discharge planning and timing and referral processes. The authors emphasise the importance of communication and collaboration within the care chain. This is in line with the findings in our study in which risks around information and communication and discharge planning were also mentioned.

The added value of the current study is that the risk inventory was based on the experience and opinion of the care providers throughout the care chain instead of using retrospective methods. Nevertheless, many of the risks mentioned by them are in line with findings in the literature. In addition, risks related to the organisation of care were mentioned, such as delayed surgery and long waiting times for rehabilitation. The study also has some limitations, the number of care providers participating in this study was limited and primarily aimed at care providers not involved in the surgical procedures. This may have led to an underestimation of risks related to the operation itself. Also, participants were not randomly selected and we do not know the response percentage for every type of provider.
To conclude, this study shows that many risks can be identified within different phases of the care chain for older hip fracture patients. The main risks involve the complications a patient can experience, but risks related to the organisation of care were also identified. Based on these findings, it is recommended to focus not only on the medical treatment of the hip fracture, but also on how the care chain can be optimised to facilitate the transition moments and rehabilitation of patients.
REFERENCES


11. IRGC (2012). An Introduction to the IRCG Risk Governance Framework. IRGC, Lausanne. EN


