Nurse practitioner led fall-risk management in the in-patient psychogeriatric patient population: A participatory action research approach to exploring the maze of evidence based strategies
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Chapter 1. Introduction

This master’s thesis report was synthesized during fall quarter 2011, of the Masters in Advanced Nursing Practice program at the University of Applied Sciences, Rotterdam, Netherlands. While compiling and analyzing the qualitative data of a Participatory Action Research (PAR) project, this paper analyzes the process and findings (process analysis), and reflects on the barriers and facilitating factors for each phase of the implementation project. The research was conducted between December, 2010 and May, 2011 at nursing home de Plantage, Brielle, Netherlands; one of the nursing facilities managed by healthcare organization: Careyn.

1.1 What prompted this research project?

Research has shown that, in addition to an increased fall risk for nursing home residents, fall incidents are greater in psychogeriatric nursing homes compared to somatic nursing homes (Kwaliteitsinstituut voor de Gezondheidszorg [CBO], 2004). Not surprisingly, a systemic review by Härlin, Dassen, Halfens & Heinze (2009), identified the pressing need for more attention to fall-risk management in cognitively impaired older adults. There is a lack of evidence to show that evidence based guidelines on fall-risk management programs - even though these are available - are actually routinely incorporated in care plans at elderly care facilities (Haralambous, Haines, Hill, Moore, Nitz & Robinson, 2010). Taking into account that physical restraint use needs to be decreased in the future, as described below, the need for adequate fall-risk management programs becomes even more crucial, and this was the main motivating factor to the research project presented here.

Background:

For the current research project, we considered the need for increased fall-risk management in the in-patient PG population and analyzed the problem area in advance of implementing an intervention strategy. In a report, which measured the care indicators concerning standards of care at Careyn, the organization-wide wish to change to a better fall-risk management plan of care and decreased fall incidents, was emphasized (Zuurmond, 2010). While we were conducting this research project focusing on closed PG wards, the organization implemented best-practice interventions which raise the bar. A grant from the governmental Care for Better projects (Zorg voor Beter) was approved for the improvement of quality care and fall-risk management at all nursing facilities of Careyn - this includes nursing home de Plantage. A module entitled: “Blijf Staan” (Organisatie voor toegepast-natuurwetenschappelijk onderzoek [TNO], Arcares & Consument en Veiligheid, 2003) was implemented at all Careyn care facilities in order to do so.

At the same time, the author of this paper researched the way in which “Blijf Staan” in combination with the Institute for Quality Health Care (CBO, 2004) fall prevention guideline are suitably implemented with respect to the specific needs of the in-patient PG population. She took into account that the new Law on care and duress (Wet Zorg en Dwang), as will be implemented in the near future by the Dutch government, will place new restrictions on the use of restraints in clients with dementia. For example, the Law prohibits fixing by means of a belt as a fall prevention measure in clients with cognitive impairments (Gulpers, Bleijlevens, Van Rossum, Capezuti & Hamers, 2010). Despite the fact that this new Law will go into effect in two years from now (2013), it is important that care facilities, and their residents and families are familiar with the problems concerning restraint use and the new restrictions that are coming down the pipe-line.

From analyzing the problem area at nursing home de Plantage, where the author of this paper is a member of the care team as student nurse practitioner, the author found that the approach to fall-risk management was often an example of acute care versus chronic care. The physician or nurse practitioner (NP) would visit a resident that had experienced a fall in order to rule out major injuries. However, continuity of care (in terms of preventive strategies), were often neglected to be implemented. For example, the author found that eight of the 24 resident care plans had included
a fall-risk management plan, while in 2009 this ward had the most (24%, \( n = 47 \)) fall reports of seven nursing wards total. Further results of the problem analysis are listed in chapter 3, paragraph 3.1. The author concluded that there was urgent need for improvement on fall-risk management at the PG wards and need to raise awareness on the new Law and its limitations to the use of restraints.

1.2 What have previous innovators done and what were the challenges?

In a review of the literature, which followed the analysis of the problem area, the author focused on studies concerning fall-risk management in the overall geriatric population. The aim was to analyze research papers that examined multifactorial fall prevention interventions implemented by a multidisciplinary team as this is prescribed for by the CBO (2004) fall prevention guideline. After analyzing the different approaches in ten recent studies, and systematically comparing the findings, the author concluded that, despite the successful results of these studies, plausible reason for the success of a multifactorial intervention to fall-rate reduction, or the need for the team to be multidisciplinary, were rarely demonstrated. At the same time, the relationship between positive outcomes of such fall prevention programs and cost-effectiveness were not mentioned.

Psychogeriatric patient population:

As mentioned earlier, fall incidents are greater in psychogeriatric nursing homes than somatic nursing homes (CBO, 2004). This is contributed to the fact that dementia, behavioral disturbances, and the use of psychopharmacca -- three aspects common in the PG patient care -- have been identified as major fall-risk factors (CBO, 2004; Van Doorn, Gruber-Baldini, Zimmerman, Hebel, Port & Baumgarten et al., 2003). Other categories that emerged from a review, which represent major fall-risk factors, were: motor impairment; impaired vision; type and severity of dementia; functional impairments; fall history; neuroleptics; and low bone density (Härlein et al., 2009). The behavioral disturbances, and the lowered cognitive awareness pose a threat to the general safety and wellbeing of the resident, but also to that of others. This is the reason why residents with cognitive healthcare problems are often housed in closed facilities.

Fall-risk assessment in the PG population:

A fall is defined in a variety of ways. For example, the World Health Organization defines a fall as: “… an event which results in a person coming to rest inadvertently on the ground or floor or other lower level.” (World Health Organization [WHO], 2010). However, in actuality the care team at de Plantage built on the judgment and definition of the person reporting the fall -- albeit the care staff, family, or resident self. Before the start of this research project, falls were registered using the electronic patient records, and sometimes the NP or physician were notified. In case there was no injury sustained during the fall, and there was no suspicion thereof, the care staff members would frequently decide to only chart the fall in the electronic patient records and file an incident report, but not notify an NP or physician. These incident reports were then sent to the administrative department. Each month a report on all types of incidents, with graphs on the number of incidents, would be send out to the management teams for review.

According to Neyens, Dijcks, Van Haastregt, De Witte, Van den Heuvel & Crebolder et al. (2006), a multifactorial fall-risk assessment tool should be used in tailoring preventative interventions to the needs of individuals with dementia. However, they go on to say that the Neyens' assessment tool does not guarantee that all risk factors are detected and therefore the identification of fall-risk for each individual is up to the clinical judgment of the different health care professionals. According to Chaâbane (2007), fall-risk assessment should be part of the routine, multidisciplinary patient review. At the same time, each fall should be examined separately in order to identify aspects, such as location, time of day, behavioral patterns and so on, in order to identify associated factors and eliminating the cause of the fall. These so called precipitating factors
should be examined in order to avoid the assumption that falling is an inevitable component to the process of dementia (Chaâbane, 2007).

In terms of fall-risk assessment, Härlein et al. (2009); and Neyens, Dijcks, Kinkelder, Graafmans & Schols (2005), have said that there is a lack of suitable fall-risk assessment tools for patients suffering from dementia. Care and (para-) medical staff are inadvertently left to their clinical judgment. Developing an assessment instrument is often the kind of method used by a particular study group conducting research on fall prevention. Myers & Nikoletti (2003), affirm this by saying that, to develop or use a risk assessment tool has been the major strategy for fall prevention programs and studies. At de Plantage, there had not been an assessment tool in place and care staff were required to use their clinical judgment on falls and fall safety measures. Until shortly before the start of this research project. The organization implemented two assessment forms to be used by the care staff as part of the responsible care improvement efforts (Norm Verantwoorde Zorg [NVZ]). The care staff are required to fill out a Careyn risk-analysis form (appendix A) and, in case the risk is scored as high, a second Careyn risk screening form (appendix B). Both forms are made by Careyn staff. The screening form, for example, is a modification based on the Morse Fall Scale (Morse, Morse, & Tylko, 1989). In paragraph 3.4 we will show the results of an evaluation we did on the use and outcomes of these forms. Unlike most studies, for this research project, a combination of use of clinical judgment, evidence-based knowledge, and (modified) assessment tools was evaluated.

**Falls risk-management interventions:**

Translating evidence based and best practice innovations into everyday nursing home practice comes with a multitude of challenges. It might therefore require a multifactorial approach (Rask, Parmalee, Taylor, Green, Brown, & Hawley et al., 2007; Capezuti, 2004). One study explained that an important factor to fall prevention is education, and that a multidisciplinary team format could address more fall-related conditions through education that are otherwise overlooked by a single discipline (Perell, Manzano, Weaver, Fiuzat, Voss-McCarthy & Opava-Ruter et al., 2008). The CBO recommendations regarding strategies for implementing a fall prevention program aimed at PG residents, was reviewed by Neyens et al., (2005). According to an appraisal of this Neyens’ review, the following recommendations were offered (Vermeulen, 2008):

- Adequate planning, appropriate staffing, good communication, and active evaluation of the implementation process.
- A well functioning fall prevention team (especially at the beginning of the implementation process).
- Registration of the fall risks and preventative measures for every individual
- The interventions need to be tailored and developed for the settings and populations. These interventions should be based on programs that have shown to be significantly effective. A small scale pilot to try out the approach should be done to estimate its attainability.
- The multifactorial intervention program should be part of the daily nursing home health care practices.

Further recommendations by the Neyens et al. (2005) group on implementing the CBO guideline are:

- Management should facilitate and initiate the multifactorial, multidisciplinary approach to fall related problems.
- Schooling and instructions should be repeated on a yearly basis.
- Fall incidents should not only be registered (MIC) but these registrations should be linked to an adequate fall prevention policy.
- The fall prevention tasks should be incorporated in the care process.
- The fall prevention tasks are clearly formulated and outlined for each professional, and a coordination of these tasks is unprecedented.
• The fall prevention tasks should be attainable and executable primarily by appropriate means and well educated staff.

At de Plantage a variety of professional resources are available, such as physiotherapists, occupational therapists, physicians, NP’s, a residential psychologist, a pharmacist, nursing assistants, and care team managers. Collaboration on care planning is in place as the medical and paramedical teams, and care staff are to debrief client care plans at regular (once every six months) multidisciplinary meetings. Therefore, raising awareness on fall prevention could be accomplished without additional costs involved. While providing care coordination support and providing adequate health care, the NP initiated and guided the implementation of a multidisciplinary, multifactorial fall-risk management approach. The aim of this research project was to utilize evidence based knowledge on fall-risk management and implement a tailored fall prevention strategy at both PG wards of nursing home de Plantage.

**Research questions:**

• What aspects of the current body of evidence on elderly fall prevention can be translated into fall prevention strategies tailored to the needs of the psychogeriatric in-patient population?
• How does the NP play a role in the process of implementing a tailored fall prevention strategy at nursing home de Plantage?
• What are the barriers and facilitating factors to each of the implementation phases?

The master’s thesis report presented here is structured in the following way: Chapter 2 discusses the methods used for the research. Chapter 3 discusses the results of the implementation process and includes more details on methods as the research results were divided up into four different phases of action and reflection. Chapter 4 depicts two poignant case examples. Chapter 5, discussion and conclusion, will give answers to the projects’ aim and research questions, will discuss the barriers and facilitating factors of the implementation process, and strengths and weakness of the research. Chapter 6 discusses the recommendations for future research and care improvement projects.

... 

There is a lack of evidence to show that evidence based guidelines on fall-risk management programs - even though these are available - are actually routinely incorporated in care plans at elderly care facilities.

...
Chapter 2. Method

Over the course of the research project the researchers offered expertise and evidence-based knowledge on fall prevention, coordination on care planning, schooling to care staff and education to family members. The outcomes were systematically and the results were analyzed in this master’s thesis report. The study design followed the guidelines of the Participatory Action Research (PAR) model (see paragraph 2.2). The outcomes that were measured were anticipated to be: fall rate; number and type of risk factors assessed; number and type of interventions used; challenges and facilitating factors; and NP role perceptions. Additional outcomes were expected to emerge during the actual implementation process. In the following section the key elements of the research method are described.

Ethics committee approval:

Approval of an ethics committee was not required for this project as the interventions used were based on current standards of care and guidelines for which we strived to have them implemented accordingly.

2.1 Study sample

For this research project we used a convenience sample of all residents living at two PG wards at nursing home de Plantage. At this nursing home there are two closed PG wards that house residents with chronic, degenerative psychogeriatric illnesses. Two wards together can house up to 48 residents (24 beds each) at a time. During the six month period of the PAR-project we assessed a total of 56 residents for fall-risk. There were no inclusion or exclusion criteria used. Eight residents died or got transferred during the project period and eight new residents were admitted. Of these 56 residents, 45% (n = 25) were considered “at risk” of falling. All residents at risk of falling were targeted with treatment interventions. However, two of these 25 residents died or got transferred before the treatment was started and therefore 48% (n = 23) of the 48 residents living there at the time, were treated with fall prevention strategies. Reviewing the medical records, 70% (n = 39) of the 56 residents suffered from a type of dementia; the remaining 30% (n = 17) of the residents that were assessed suffered from post CVA or other cognitive illnesses. In table 1 we listed the demographics on gender, age and type of cognitive illness for the sample population (N = 56) that were assessed and the residents that were treated (n = 23).

Table 1. Demographics of total sample assessed and sample treated

<table>
<thead>
<tr>
<th></th>
<th>Assessed N = 56</th>
<th>Treated n = 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20 (36)</td>
<td>11 (48)</td>
</tr>
<tr>
<td>Female</td>
<td>36 (64)</td>
<td>12 (52)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-80</td>
<td>23 (41)</td>
<td>9 (39)</td>
</tr>
<tr>
<td>80+ &gt;100</td>
<td>33 (59)</td>
<td>14 (61)</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alzheimer’s</td>
<td>27 (48)</td>
<td>11 (48)</td>
</tr>
<tr>
<td>Vascular</td>
<td>6 (11)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Mixed</td>
<td>5 (9)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Lewy Body</td>
<td>1 (2)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Other</td>
<td>17 (30)</td>
<td>5 (22)</td>
</tr>
</tbody>
</table>
2.2 Participatory action research

Because the research design was based on a participatory action research (PAR) model, the NP fulfilled the role of researcher as well as participant. This was the case for every member of the multidisciplinary team. The knowledge that was acquired generated further action and further learning. Participatory action research is a model to implementing innovations in which the collaborative efforts are central to the learning process. PAR is aimed at initiating change. It aims at creating open space for self-directed action and self-directed learning, while the researchers maintain control over the context in which the change is made possible (Boog, 2007). For example, in this project the manner in which the researchers maintained control was by continuously placing the self-directed actions and reflections within the context of the existing body of evidence. The new acquired knowledge that was produced by this action research project generated further action, but continued to be weighed against previous research findings.

Even though there are different phases to action research, the project represented a circular process of planning, acting, collecting evidence and reflecting upon the results (see figure 1 below). We planned the different phases of exploring possibilities, designing new action scripts, and testing the new action scripts in the field, in four phases which are described in more detail in results (chapter 3). In theory, action research sees people as subjects or variables and action-learning happens in phases of reflection. Most importantly, the goal is to generate knowledge (Boog, 2007).

Figure 1. Participating Action Research (PAR): research in cycles

During a six-month period we implemented a multidisciplinary approach to fall prevention at two closed PG wards of nursing home de Plantage. The formal participating researchers were: Huub van Alem (specialist geriatrics medicine), Tanja Ista (occupational therapist), Sandy de Bruyn and Violet Boer (nurse assistants), and Rianne Kooiman (student nurse practitioner) which coordinated and evaluated the project. Part of the disciplines that became more involved during the course of the project were: a second occupational therapist, a second NP, two physiotherapists, the
residential psychologist, the wards physician, and the care team manager. Reliability and validity on the assessment tools that were used are described in chapter 3, paragraph 3.2 below.

### 2.3 Role of the nurse practitioner

As brought up earlier, nursing home staff are using their clinical judgment to monitor fall-risk factors (Neyens et al., 2006), but how well are they trained in doing so? Researchers have stated that the advanced practice nurse (such as the NP) could play a vital role in the process of developing clinical thinking skills (Quigley, 2007; Davies, Doherty, Glover & Johnson, 2004). According to what is taught at the M ANP program in Rotterdam, the NP can play different roles (see table 2), and for each of these roles a number of competencies are required. The author hypothesized that, because the NP is able to fulfill these different roles, she can provide skills, knowledge and professionalism to the process of implementing a healthcare innovation. For example, the NP was able to do a problem analysis to assess the current situation and a structured review of the literature to research the actual risks and the problems related to fall prevention. For this process she used part of the competencies in her role as expert (i.e. do research).

**Table 2. Roles, domains and competencies of the nurse practitioner according to the M ANP Rotterdam**

<table>
<thead>
<tr>
<th>Role</th>
<th>Domain</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert</td>
<td>Nurse practitioner</td>
<td>• Give care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Guide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Innovate</td>
</tr>
<tr>
<td>Co-health</td>
<td>Medical interventions</td>
<td>• Assess/Diagnose</td>
</tr>
<tr>
<td>provider</td>
<td></td>
<td>• Treat</td>
</tr>
<tr>
<td>Coordinator</td>
<td>Directorship</td>
<td>• Coordinate</td>
</tr>
<tr>
<td>Advisor</td>
<td>Organization</td>
<td>• Increase knowledge and skills</td>
</tr>
<tr>
<td>Professional</td>
<td>Profession</td>
<td>• Leadership</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-directed learning</td>
</tr>
</tbody>
</table>

Because the NP is able to perform these different roles, she can be of means to health care improvements on different levels. While becoming an expert on the subject of fall prevention, the NP remains a co-health provider and joins the care teams in developing the right treatment and care plans. In her role as advisor, she supports the development of care staff clinical judgment skills. On an organizational level, the NP can provide advice, grounded in scientific evidence and her experience in best-practices. She develops policies on a topic such as fall prevention on an organizational level. She has firsthand experience working as part of the care team at the nursing wards, has interviewed care staff and has read the literature. As a professional NP, she can use her leadership skills and self-directed learning in order to improve her own knowledge and expertise and that of the staff and organization.
Chapter 3. Results of the PAR-project

For this project we planned the different phases of exploring, designing and testing the new action scripts, in four phases. These phases were: Phase one (research and planning); Phase two (assessment); Phase three (intervention); and Phase four (evaluation). In this chapter the outcomes of each phase are compiled, presenting the aim, approach, results and reflection on barriers and facilitating factors for each phase.

3.1 Phase one -- research and planning (November, 2010 - January, 2011)

**Aim:**

In phase one we aimed to research the problem area and establish a multidisciplinary fall prevention team to assess risk factors and recommend treatment options. In this way we aimed to facilitate the research and planning of the implementation of the current body of evidence on fall prevention and evaluate its fit to the psychogeriatric patient population.

**Approach:**

- For the problem analysis, the NP looked at the 2009 MIC forms and analyzed the precipitating factors to fall incidents (see table 3).
- For the review of the literature, the NP used Using Cinahl Plus, PubMed, and Cochrane library for a search on scientific papers published in English or Dutch between 2000 and August 2010. Key terms that were used: fall prevention; fall clinic; fall management; multifactorial; multidisciplinary; and advanced practice nurse. Ten original research articles, experimental and non-experimental, were included (see table 4).
- The NP wrote up a project planning report according to the PAR model (see table 5).
- The NP mobilized and empowered appropriate disciplines by inviting stakeholders, such as: occupational therapist (OT): Tanja Ista, who previously had implemented a fall prevention project at small scale residential PG homes (kleinschalig wonen) and a specialist geriatric medicine (SGM): Huub van Alem, who had a lot of expertise on fall prevention and the Laws concerning care for cognitively impaired patients (Wet bijzondere opnemingen in psychiatrie ziekenhuizen [BOPZ]).
- The NP formed an assessment team together with a nurse assistant from each ward and the OT.
- The NP approached and informed the pre-existing care and management teams.

**Role of the NP:**

- As expert (researcher and care-giver), the NP’s tasks were to research and identify the patient population related problems (for patient, family, and staff) concerning falls in closed PG wards by analyzing the 2009 MIC forms. The NP’s tasks were to research the current body of evidence on fall risk assessment and fall prevention interventions in de PG as well as in nursing home populations. Additionally, the NP’s task was to gain knowledge of the barriers and facilitating factors (e.g. cost effectiveness) to fall prevention strategies in general and analyze the barriers and facilitating factors to the research and planning phase.
- As professional, her tasks were to have the right leadership skills to get disciplines involved, make decisions on the project approach (e.g. risk factors to be assessed and interventions to be used).
- As coordinator, her tasks were to disseminate the right information down to the involved disciplines and keep them involved.
**Results:**

**Problem analysis:**

In the problem analysis that was done previous to the start of the implementation project, a sample of 60 incident (MIC) reports from 2009 were analyzed on precipitating factors as was recommended by Chaâbane (2007). These reports were from all seven wards, including PG, somatic care and residents with non-congenital brain damage. In this dataset one third (32%, n = 19) of the residents fell while walking without the use of an assistive device (such as cane or walker). Furthermore, a fall incident occurred often in the evening (between the hours of 18.00 and 00.00 midnight), and occurred often in the bedroom. In table 3 you will find an overview of the precipitating factors, level of injuries sustained, and post-fall measures taken. From looking at the reports, it came to the NP’s attention that the type of measures that were taken were limited in number and were not well thought out. For example, in one case a resident had fallen out of bed at night. The measure that was taken was to fixate the resident in the wheelchair during the day - a measure which is unrelated to the time and location of the fall incident. Another noteworthy finding in this dataset was that in most cases (75%, n = 45), the staff failed to describe or decide upon any measure.

**Table 3. Aspects of the fall incident reports (N = 60)**

<table>
<thead>
<tr>
<th>Timeframe:</th>
<th>N = 60 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evening (18.00 - 00.00)</td>
<td>26 (43)</td>
</tr>
<tr>
<td>Afternoon (12.00 - 18.00)</td>
<td>18 (30)</td>
</tr>
<tr>
<td>Morning (07.00. - 12.00)</td>
<td>10 (17)</td>
</tr>
<tr>
<td>Night (00.00 - 07.00)</td>
<td>6 (10)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location:</th>
<th>N = 60 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedroom</td>
<td>27 (45)</td>
</tr>
<tr>
<td>Bathroom/toilet</td>
<td>12 (20)</td>
</tr>
<tr>
<td>Living room</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Recreational room</td>
<td>6 (10)</td>
</tr>
<tr>
<td>Hallway</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of fall:</th>
<th>N = 60 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fell during walking (without assistive device)</td>
<td>19 (32)</td>
</tr>
<tr>
<td>Fell/slipped out of (wheel) chair</td>
<td>15 (25)</td>
</tr>
<tr>
<td>Fell/slipped out of bed</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Fell during walking (with assistive device or walker)</td>
<td>5 (8)</td>
</tr>
<tr>
<td>No fall, but identified dangerous situation*</td>
<td>4 (7)</td>
</tr>
<tr>
<td>Fell/slipped off the toilet</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Fell during standing up or sitting down</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Fell during transfer (with lift of care support)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cause:</th>
<th>N = 60 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restraint failed to function (belt/movement sensor)*</td>
<td>10 (17)</td>
</tr>
<tr>
<td>Independently tried to transfer</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Dizzy, health problem or restlessness</td>
<td>7 (12)</td>
</tr>
<tr>
<td>Independent transfer and need to go to the bathroom</td>
<td>7 (12)</td>
</tr>
<tr>
<td>Loss of balance, and walked without assistive device</td>
<td>6 (10)</td>
</tr>
<tr>
<td>Unknown</td>
<td>6 (10)</td>
</tr>
</tbody>
</table>
Loss of balance, but walked with assistive device 5 (8)
Missed the chair or couch while sitting down 2 (3)
Was left unattended 1 (2)
No shoes and slippery floor 1 (2)

**Sustained injury**:  
No injury or not yet known 42 (70)
Bruises, red spots or bumps 6 (10)
Laceration 6 (10)
Superficial skin tear 4 (7)
Pain 2 (3)
Out of socket or fracture 1 (2)

**Measures taken**:  
No measure or not mentioned 45 (75)
Fixation in (wheel) chair with belt, body point or tray table 8 (13)
Movement sensor 2 (3)
Observation 1 (2)
Client was educated on not going to the bathroom alone 1 (2)
Use wheelchair in case client needs to travel far 1 (2)
Help the client stand up or use a gait belt 1 (2)
Check everything 1 (2)

* The dysfunction of a restraint is a reason to fill out a MIC form at this facility. This does not necessarily mean that a fall was the result of the restraint not functioning. This cause can therefore not be associated with a cause of a fall. ** In some cases the resident sustained more than one injury.

Review of the literature:

The aim of the literature review was to compare fall prevention intervention studies on multidisciplinary and multifactorial approaches (see table 4). Most all (90%, n = 9) intervention teams in the studies consisted of a multidisciplinary team, except for Moore, Williams, Ragsdale, LoGerfo, Goss & Schreuder (2010), which consisted of an advance nurse practitioner only. In the study done by Haumschild, Karfonta, Haumschild & Phillips (2003), a consultant pharmacist conducted the medication review, but a team consisting of a nurse and a physician were involved in reviewing and implementing the recommendations from the pharmacist. Usually a physician, a physiotherapist or occupational therapist and a nurse practitioner, nurse or nurse assistant, were part of the multidisciplinary team. Of note was that, in addition to the pharmaceutical study done by Haumschild et al. (2003), two other intervention teams included a clinical pharmacologist (Perell et al., 2008; Hart-Hughes, Quigley, Bulat, Palacios & Scott, 2004). ANP involvement was mentioned in 40% (n = 4) of the studies, but for one of these, ANP’s were involved only in training the intervention teams (Rask et al., 2007).

Of the studies that were reviewed, 60% (n = 6) used a multifactorial fall prevention approach (Neyens, Dijcks, Twisk, Schols, Van Haagstregt & Van den Heuvel et al., 2009; Lord, Tiedemann, Chapman, Munro, Murray & Sherrington, 2005; Moore et al., 2010; Hill, Moore, Dorevitch & Day, 2008; Hart-Hughes et al., 2004; Perell et al., 2008). The other 40% (n = 4) used staff training (Rask et al., 2007; Capezuti, Taylor, Brown, Strothers & Ouslander, 2007), patient education (Clemson, Cumming, Kending, Swann, Heard & Taylor, 2004), or medication modification (Haumschild et al., 2003) only. A significant reduction in fall-rate after intervention was found by 80% (n = 8) of the studies analyzed for the review. These studies found that their multi- or single factorial fall prevention intervention, implemented by a multidisciplinary team, had a significant effect on the reduction of fall incidents. In the two other studies, the fall-rates remained stable pre and post intervention (Rask et al., 2007) -- or fall-rate was not measured, instead, barriers to the implementation of a fall prevention program were analyzed (Capezuti et al., 2007).
Table 4. Recommendations and referrals included in each (N =10) study intervention

<table>
<thead>
<tr>
<th>Authors</th>
<th>Intervention referrals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exercise program</td>
</tr>
<tr>
<td>Neyens et al., (2009)</td>
<td>X</td>
</tr>
<tr>
<td>Lord et al., (2005)</td>
<td>X</td>
</tr>
<tr>
<td>Moore et al., (2010)</td>
<td>X</td>
</tr>
<tr>
<td>Hill et al., (2008)</td>
<td>X</td>
</tr>
<tr>
<td>Rask et al., (2007)</td>
<td></td>
</tr>
<tr>
<td>Capezuzi et al., (2007)</td>
<td>X</td>
</tr>
</tbody>
</table>

Total 6 5 4 4 3 3 3

Project strategy:

The NP chose the participatory action research model (PAR) in order to work collaboratively on implementing an innovative approach and evaluating the qualitative data coming from the research project. For each of the different phases of the PAR approach (as shown in figure 1), the aims and actions were planned out precisely.

Intention-to-treat:

It was not required to repeat an action from one of the phases into the next, as this project did not mean to develop a polished intervention. However, the assessment and intervention phases did continue on and were re-evaluated during each period. The aim of the research project, as stated earlier, was to mobilize and guide the available disciplinary resources and ask them to reflect upon their own practice. An actual fall management intervention was implemented and in doing so a systematic evaluate of the outcomes, the challenges and facilitating factors, was conducted. The intention-to-treat principle was of importance during this project and functioned as a quality of care measure. All residents that were found to be “at risk” of falling, were treated for fall risk. The team assured high quality care by adhering to the intention-to-treat principle. By the end of phase four (evaluation), we were able to analyze the process, barriers and facilitating factors, and we developed an intervention which could guarantee that the fall-risk management approach would be sustained and integrated into daily practice. In table 5 you will see how the NP planned out each phase of the process. In phase one (research and planning) the teams were assembled and would set the context for the next phase. In phase two (assessment) and three (treatment) the actual intervention was implemented, and in phase four (evaluation), the results were evaluated through the process of reflection.
### Table 5. Project strategy according to PAR

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
</tr>
</thead>
</table>

#### Study/plan:
- Who should be invited to the team and how will the organization be informed on the project details.
- Meetings throughout the three-month period for each phase.

#### Action:
- **1. ANP invites team members and informs the organization.**
- **2. Meeting (1):** discuss with team all aspects of the project, and in specific what approach to collaboration we will take in assessment of de patient (phase 2), implementation of the intervention (phase 3) and the type of schooling for staff (phase 3).

#### Collect/evaluate:
- Response from the team members and their initial ideas on the approach they would like to take. Evaluate briefly.

#### Reflect:
- Each member reflects.

---

- **Study/plan:**
  - When and how will each member assess the patients.

- **What plan to take.**

- **What outcomes to measure.** (fall rate, types and number of interventions taken, types and number of risks assessed, challenges and facilitating factors found. Types of responses to these. Problem solving. Reflections.

- **1. Comprehensive fall-risk assessment.** Each member assesses the patients (December, 2010).
- **2. Meeting (2):** discuss the risk factors found and how these should be interpreted as low, medium or high risk level (January, 2011).

- **1. Meeting (3):** discuss potential alternatives to treatment if risks are modifiable, or possible safety and preventative measures if the risks are not modifiable.
- **2. Implement the interventions.**
- **3. Offer schooling or training.**
- **4. Request consultation of a specialist (pharmacist, psychologist, physiotherapist).**

- **Write a master’s thesis report.**

- **Collect/evaluate:**
  - All data regarding the assessment, the multidisciplinary review, and the options regarding fall prevention interventions.

- **Collect/evaluate:**
  - All data regarding challenges and facilitating factors in relation to implementing the interventions.

- **Collect/evaluate:**
  - All data related to the outcome measures.

- **Reflect:**
  - Each member reflects.
Mobilized disciplines:

Multiple disciplines were mobilized, teams were formed, and pre-existing teams got involved. Two different multidisciplinary teams were formed for this project and three teams already existed:

1. Fall-risk assessment team: consisted of a nurse assistant from each of the two PG wards, the OT, and the NP.
2. Consultant fall prevention team: consisted of the NP, OT and SGM.

The pre-existing teams were approached and informed of the upcoming fall prevention project and the recommendations that would be made by the consultant team:

3. Care and medical team at each ward: consisting of the wards physician, the wards NP and nurse assistants.
4. Management team: PG department’s care team manager and location manager.
5. Blijf Staan project teams: while the PAR-project (run by the NP and aimed only at two PG wards of one care facility) ran, the organization requested a governmental grant and hired a project manager for a parallel fall prevention project using the Care for Better (Zorg voor Beter) module: “Blijf Staan”. This parallel project was aimed at all other wards of the 14 total different care facilities of Careyn. These facilities also included PG, somatic and rehabilitation wards. The NP and the project manager stayed in close contact and kept each other informed. The project manager kept the NP informed on PG specific interventions that are part of the Blijf Staan module. These involved a set of worksheets that could be used by care staff and physiotherapists to assess risk factors, and a short description on interventions to be used in this population.

Unplanned results:

The project started living a life on its own (Dutch metaphor for this phenomenon: a growing oil stain): Throughout all phases, the NP, OT, SGM, nurse assistant and Blijf Staan project manager spoke with colleagues, such as physiotherapists, psychologist, care team managers, physicians, nurse practitioners and management which prompted them to look at fall prevention in their own practice. As a result of the topic being discussed amongst colleagues, they were inspired to come up with strategies combining separate care topics with fall prevention. This is an example of how members of an organization can become empowered to search for improvements independently.

Some examples are:

- During the pharmaceutical meeting (FTO) the need to combat polypharmacy was raised. Polypharmacy is referred to when someone uses more than five (>5) medications per day (WHO, 2003). The pharmacist asked the group of physicians and managers for which patient group to start assessing for polypharmacy first. One of the physicians suggested to start with the patients at risk of falling. The NP then discussed this initiative with the Blijf Staan project manager and physician in question and they decided to recommend that a list of all ambulatory residents (from all wards) that use more than five different medications a day should be sent to the pharmacist for review. Because polypharmacy in itself is a fall-risk factor (WHO, 2003), this way a fall prevention strategy would be implemented by screening all ambulatory residents for polypharmacy at all Careyn facilities.

- Another example is that of the PT who had heard about the fall prevention project at her PG ward and started researching the issue of individualized exercise programs for PG residents. Her question was: “Is the approach of individualized training programs not beneficial in the PG population, or do we (PT department) lack the expertise?” She decided to discuss the issue with a PT colleague at a different Careyn nursing home and came up with the following: According to her colleague, the most important indication for physiotherapy treatment in the PG population is that of fall-risk. Physiotherapy is an important aspect, especially in the prevention phase, and any
changes in gait, balance or stability should be an indicator to care staff or PT to start treatments. The PT treatment should be aimed at condition and muscle strength training. This should be done in individual training sessions as group sessions present too much distraction for the resident with cognitive impairments. In a playful matter (such as by playing catch with a balloon) movements can be provoked in the resident with dementia. Because these statements need to still be referenced with existing evidence, the NP asked the PT department to do more research on this.

- Care staff members would start asking important questions, as they had noticed a shift in care and approach to fall prevention. For example, a night nurse noticed the medication adjustments (in phase three) and sent an email to the NP and Blijf Staan project manager asking if this might result in increased behavioral disturbances. Asking these questions meant that care staff were keen on getting information on the causes and effects of fall risk and fall prevention and were getting actively involved in the discussions.
- Lastly, a colleague NP remembered she had once assessed all residents of one of the PG wards for cerumen-impaction (earwax blockage). She found that 16 (67%) of the 24 residents needed to have one or both ears irrigated. The NP suggested that this approach might be an appropriate fall-risk management strategy for the PG population concerning hearing impairments. See chapter 6 for more details on hearing impairments and fall prevention.

Reflection on barriers and facilitating factors:

**Barriers:**

Lack of time posed a barrier to staff involvement. Most disciplines felt the lack of time to add on a new project. For example, the PT department has 20 minutes of time per resident (eight hours a week per ward). Fifty percent of this time is allocated for administrative tasks, care planning and meetings. Again fifty percent of the remaining four hours is spent on observing the residents during ADL or wheelchair use and assessing the problems. What’s left are two hours of time to actively treat (24) residents each week. According to the PT, this comes down to about three to four residents of the 24 total residents at one ward that are being treated at any given time. On the other hand, the NP found that there was no barrier in time for her to organize the project aspects (i.e. plan meetings, write reports, assess the residents of both wards, treat the residents of one of two wards) during her regular schedule.

**Facilitating factors:**

Awareness of the problem and (financial) incentive to improve to better quality care facilitated change. Before the start of the PAR-project, the problem concerning fall incidents had already been identified as incident registration (MIC) rapports showed increased levels of fall incidents for a number of years. However, management was motivated to change to better quality care by the health insurance provider announcing they would withhold a portion (5%) of the general payment package starting in 2011. For part of this withheld portion, the organization could declare costs spent on quality improvement projects and schooling. For this, the organization decided to take fall prevention as one of the major improvement project topics. Earlier, in 2010, the health insurance provider had stated that, in order to continue receiving health care costs coverage, all care organizations were required to do risk inventories twice yearly on the following topics: skin breakdown, falls, medication errors, nutrition, and depression. These were major facilitating factors to the start of the PAR and Blijf Staan projects as there was interest to change, awareness of the need, and financial incentive to make improvements on different levels.

Because a parallel project (Blijf Staan) was initiated at the same time as the PAR-project, this was another facilitating factor. All throughout the nursing home, and from different angles, awareness on the topic of fall prevention was raised.
Being an active member of the care and medical team as project coordinator, was another major facilitating factor. The multitasking NP is trained in different roles, each very important to the implementation of innovative projects. It was a facilitating factor that one discipline could play these different roles. Even though the project was a collaborative effort, to have one discipline evaluate the problem, review the literature, coordinate the program and participate in it as co-health provider meant that the aspects of evidence-based and practice-based knowledge were integrated at the heart of the endeavor. Compared to the project manager of the Blijf Staan project, who was not an active member of the care teams, she found it difficult to gain entrance into these groups. She was viewed as an “outsider” and this was often a barrier to her project. Whereas the NP was viewed as part of the care team, and colleagues would more easily defer to her suggestions. Perhaps this was the most facilitating factor to implementing a care improvement project.

Compared to a project design where the implementation would present additional tasks to be done -- directed down from the top -- the PAR-model offered all participating disciplines the autonomy to start making changes in their own practice and at their own pace. Everyone was inviting to participate and offer their expertise. The NP made sure to mention to each colleague that she knew fall prevention was a well know topic within someone’s scope of practice and that they were invited to tap from their own expertise and literature to suggest ways to make improvements.

### Barriers

- Lack of time

### Facilitating factors

- Raised awareness
- Financial incentive
- Being an active member of the care team
- Participatory and collaborative approach

#### 3.2 Phase two -- assessment (January - March, 2011)

**Aim:**

In phase two the researchers aimed at gathering information on intrinsic and extrinsic risk factors of each resident of two closed PG wards according to the current body of evidence. They did this by means of a multifactorial, multidisciplinary risk assessment. The consultant team then discussed the findings to come to recommendations on tailored fall prevention strategies for each resident at risk of falling.

**Approach:**

- Tools used to assess the risk factors:
  - Electronic patient records
  - Interviewing care staff
  - Excel spreadsheet
  - Blijf Staan module: worksheets for PG population
  - POMA (Tinetti) test
  - Barthel-index
  - AMPS test
  - Careyn risk analysis form
  - Careyn fall-risk screening form
  - Blijf Staan module: environmental check

- Together with the NP, the OT and SGM formed a consultant team and were to review the patient records on functional status, medical and nursing care needs, and the types of fall prevention interventions already incorporated in the plan of care. The main questions that the
consultant team members asked themselves were: what are the factors contributing to fall risk for this individual, and are these factors modifiable? In case of modifiable factors, what are the alternatives and are these alternatives feasible? If not modifiable, what are the protective and preventive measures we could take? In addition to offering treatment recommendations to the care team, the consultant team could suggest that a specialist (such as the residential psychologist, pharmacist, or a consultant psychiatric NP) look at complex cases and evaluate the cognitive status, pharmaceutical alternatives or training and learning abilities of the resident.

- The NP invited a nurse assistant from each ward to join her and the OT in a fall-risk assessment team. This team looked at internal and external risk factors.
- The care team, which consisted of the wards physician, NP, care staff, first responsible nurse assistant (FRNA), OT, PT and the psychologist, gradually became more involved as the project moved along. This team continued to function as the team that implemented the strategies, evaluated the effectiveness and offered feedback on feasibility of the interventions to the NP. The FRNA remained in charge of the care plan coordination for a small number of residents and played a pivotal role in coordinating the continuity of care and evaluating the changes to the care plan.
- The NP and OT used the electronic patient records as well as interviewing care staff to gather the information. The NP used an Excel spreadsheet to gather information on each resident on the following items: name, age, weight loss, number of falls in 2010 and in 2011, (potential) hearing problem, (potential) vision problem, number of risk medications, ambulatory or wheelchair bound during period 1, and on items such as name, age, number of falls in 2010 and in 2011, number of risk medications, and ambulatory or wheelchair bound during period 2 (see table 6). The NP also used part of the worksheets of the Blijf Staan module as an aid to gain insight into the medical status. The OT used the Tinetti Performance Oriented Mobility Assessment or POMA (Tinetti, Baker, McAvay, Claus, Garrett & Gottschalk, et al., 1994), the Dutch version of the Barthel-index (De Haan, Limburg, Schuling, Broeshart, Jonkers & Van Zuylen,1993) and the Assessment of Motor and Process Skills (AMPS) test (Kottorp, Bernspang & Fischer, 2003), in addition to observation to gain insight into the functional status and balance of residents “at risk”.
- The resident FRNA used the Careyn risk analysis form (appendix A), and the Careyn fall risk screening form (appendix B) to score the levels of risk for each resident living at the ward at the time, and the NP reviewed these two forms once they were filled out. These forms were implemented shortly before the start of this project and were evaluated during the schooling session the NP gave (see phase three and four). These forms are used upon admission and every six months, right before the regular multidisciplinary care planning meetings. The two nursing assistants in the risk assessment team did an environmental check (Blijf Staan module), assessing for environmental hazards at each of the two wards.
- Residents considered “at risk” of falling were discussed in the first two consultant team meetings. Residents that continued to experience fall incidents were discussed in the second two consultant team meetings. There were four consultant team meetings total.

**Role of the NP:**

- As co-health provider, the NP’s tasks were to assess the risk factors within her scope of practice of all residents of the NP’s PG ward. For the purpose of this project the NP did the same for the other PG ward and assisted that ward’s NP in doing the same.
- As coordinator, the NP’s tasks were to prepare and run the consultant team meetings.
- As advisor, her tasks were to give advice on the approach to PG related fall-risk factor assessment to all involved disciplines.
- As expert, the NP’s tasks were to research outcome measures of the assessment phase (phase two) and evaluate the appropriateness of the tools used to measure the outcomes. The NP’s task was to systematically analyze the barriers and facilitating factors to the assessment phase.

**Results:**
Tools used:

Not all risk assessment tools were of use. According to the OT, completing the Barthel-index, a reliable and valid tool when used in post-CVA residents (Bugnet, 2008), did not offer support in risk factor assessment in this patient sample. The tool offered a general insight into the abilities of the resident, but the types of activities the residents were capable in doing in this patient sample were very limited. The AMPS (Assessment of Motor and Process Skills), on the other hand, could be of use, in that its different observation items (i.e. navigation and walking) identify fall risk. But in order to be able to use the AMPS, the OT or PT needs to be schooled in it. Only one of four members of the PT/OT department was schooled in using the AMPS. Further research is needed on the validity of the AMPS test (Kottorp et al., 2003). The OT concluded that, using the POMA test alone, offered enough insight into those risk factors that should be alarming to an OT or PT in the PG patient population. These are: coming to a stand (having enough muscle strength of the legs); making transfers (being able to turn); and gait length, rhythm and symmetry. These factors can then be used as a guide in preparing individualized exercise programs. However, when a resident has behavioral disturbances or is difficult to communicate with, the POMA cannot always be completed entirely. One aspect of the POMA, for example, is to push on the sternum of the resident -- something you are not likely to do when you are not able to explain to the resident why you are pushing him or her. More research on the validity of the POMA in populations with mild, moderate and severe dementia is needed (Sterke, Huisman, Van Beeck, Looman & Van der Cammen, 2010).

The Blijf Staan environmental checklist resulted in a list of items that were not considered safe according to the Blijf Staan module. For example, windowsills with sharp edges, or wet floors were found at both wards. A list of the unsafe items was sent to the care team manager and as the Blijf Staan project manager had done the same at all other wards of de Plantage nursing home, the lists were compiled and sent to the head of facilities.

Risk-factor assessment:

Some risk factors could not be assessed or did not show to have a link to falling: At the start of the project we decided to use the CBO (2004) guidelines on risk factor assessment. We additionally used the Neyens et al., (2006) research outcomes for risk factors, but these did not differ much from the CBO guidelines. The risk factors that could not accurately be assessed in this patient sample were hearing and vision problems. Assessing the severity of a possible hearing or vision problem, and the acuity of the sensory aid, was viewed as convoluted in this sample due to severe cognitive impairments and inability to participate in hearing or vision tests. The NP assessed for sensory problems by interviewing the care staff and found that residents with a history of either a hearing or vision problem did not always use their hearing aid or glasses. The NP found that previous to the PAR-project, residents at de Plantage had been checked by a consultant audiologist. Residents are referred to the audiologist by either the speech therapist or the physician. In the time that the NP was an active member at one of the two PG wards, she does not recall that residents were referred to the audiologist. The NP was not able to retrieve information on who had been seen by the audiologist in time for the preparation of this report. In chapter 6 the recommendation to refer all residents with hearing aids, or the suspicion of hearing loss, to the audiologist was included.

There were risk factors that were assessed, but that did not show to have a clear relationship to an increased fall-risk in this patient sample. These were: weight loss (only 1 of the residents that had a fall history had experienced a weight loss of 5% within a month or 10% within 6 months); and age (across age ranges the residents experienced a level of fall risk. See table 1 above).
Two risk-assessment periods:

During the six-month time frame of the PAR-project, we had two periods (period 1 and 2) of phase two -- risk assessment. The residents “at risk” of falling were screened on fall history, medication regimen, behavioral disturbances and co-morbidities (such as cardiac disease or neuropathic disease) by the NP, and were screened on mobility and safety during transfer and ambulatory pattern by the wards occupational- or physiotherapist. These risk assessments were then discussed in the consultant team meetings. After each assessment period, we held a consultant team meeting.

- Period 1 ran from January 1 till February 16
- Period 2 ran from February 16 till March 16

The consultant team meetings were held on February 16, and March 16. Assessment period 1 ran from January 1 till February 16, 2011. However, during this period we were only able to assess 27 residents of the 48 residents living at both wards at the time, because of lost time getting used to doing the risk assessments. Period 2 ran from February 16 till March 16. By this period we had gotten more experienced in doing the risk assessments. During period 2 we assessed 29 new residents. A total of 56 residents were assessed during the PAR-project. In table 6 the results of the assessments, sorted by risk factor and period, are shown.

Table 6. Number of residents per assessed fall-risk factor

<table>
<thead>
<tr>
<th>New residents assessed in period 1:</th>
<th>N = 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk factors:</td>
<td></td>
</tr>
<tr>
<td>Fall history in 2010</td>
<td>14</td>
</tr>
<tr>
<td>Fall incidents since January 2011</td>
<td>7</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>12*</td>
</tr>
<tr>
<td>Risk medication</td>
<td>16</td>
</tr>
<tr>
<td>Mobility or balance problems</td>
<td>5</td>
</tr>
<tr>
<td>Behavioral problems</td>
<td>9</td>
</tr>
<tr>
<td>Co-morbidities posing risk besides cognitive impairments (Korsakoff’s syndrome n =1, epilepsy n =1, cardiac disease with hypotension: SBP &lt;90 or DBP &lt;60 n =1, or infection causing delirious episodes n = 2)</td>
<td>5</td>
</tr>
<tr>
<td>Estimated hearing impairment</td>
<td>3</td>
</tr>
<tr>
<td>Estimated vision impairment</td>
<td>7</td>
</tr>
<tr>
<td>Weight loss</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New residents assessed in period 2:</th>
<th>N = 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk factors:</td>
<td></td>
</tr>
<tr>
<td>Fall history in 2010</td>
<td>17</td>
</tr>
<tr>
<td>Fall incidents since January 2011</td>
<td>9</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>13*</td>
</tr>
<tr>
<td>Risk medication</td>
<td>21</td>
</tr>
<tr>
<td>Mobility or balance problems</td>
<td>5</td>
</tr>
<tr>
<td>Behavioral disturbances</td>
<td>11</td>
</tr>
<tr>
<td>Co-morbidities posing risk besides cognitive impairments (cardiac disease with hypotension n = 2)</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total residents assessed in the PAR-project:</th>
<th>N = 56</th>
</tr>
</thead>
</table>
| * These residents were considered to be “at risk” of falling because they were either ambulatory or independent in making transfers.
Considered “at risk”:

Residents that were ambulatory or independent in making transfers were considered “at risk” of falling. The residents with or without a fall history, and now wheelchair or bed bound were only briefly assessed by the NP and OT with the help of the care staff, but were not discussed in the consultant team meetings. Because it was important to be able to quickly identify residents at risk of falling – as we found that the fall-rate could be up to twice a day -- the NP together with the OT decided that for a cognitively impaired resident to be ambulatory or independent in making transfers, would place him or her at a great level of fall-risk. The residents that were bed or wheelchair bound and not able to independently get out of the wheelchair or bed, were only at risk of falling if care staff were to make an unsafe transfer with the transfer lift. Of the 59 total fall incidents that occurred between January and May, 2011, one fall incident was related to an unsafe dependent transfer.

Consultant team meetings:

Not all residents that were assessed were discussed in the consultant team meetings. For example, of the 27 residents that were assessed in period 1, six had died or were transferred before the meeting took place. Of the remaining 21, 12 were found to be at risk of falling because they were ambulatory or independent in making transfers. These 12 residents (referred to as Group A in table 7) were discussed in the first consultant team meeting on February 16. Of these 12 residents, seven had experienced a fall in period 1 (between January 1 and February 16). These seven residents combined had experienced 20 falls total. During period 2 we had 13 new residents considered at risk of falling, as they were ambulatory or independent in making transfers. Two of these 13 residents died or were transferred before the second meeting took place, and the remaining 11 residents (referred to as Group B in table 7), were discussed in the consultant team meeting on March 16. See table 7 for an overview of each period and number of residents at risk, number of residents that fell, and number of falls within the assessment period.

Table 7. Number of residents that were at risk, that fell, and number of falls in period 1 (group A) and period 2 (group B)

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents at risk:</td>
<td>12</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Residents that fell:</td>
<td>7</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Number of falls:</td>
<td>20</td>
<td>17</td>
<td>37</td>
</tr>
</tbody>
</table>

Participatory action research - a circular process:

In the periods that followed period 1 and 2, we continued to have two more consultant team meetings. These were held on April 6 and May 6. During the time in between these meetings (referred to as periods 3 and 4) we re-assessed all residents for any new fall incidents and we evaluated the implementation of the treatment plans. During period 2, for example, we found that three of the 12 residents from group A had continued to experience fall incidents. In period 3 (between March 16 and April 6) we found that 6 of the 23 residents (group A and B combined) had experienced another fall incident. During period 4 (between April 6 and May 6) we found that 3 of the 23 residents had new fall incidents reported. As we had assessed and discussed all “at risk” residents by the end of period 2, we naturally moved on to discussing only those residents that continued to experience falls in the second two consultant team meetings. In phase three (paragraph 3.3) we will discuss this in more detail.

- Period 3 ran from March 16 till April 6
- Period 4 ran from April 6 till May 6
Reflection on barriers and facilitating factors:

**Barriers:**

It was a barrier to spent time using assessment tools that had no added value in risk assessment in this patient sample. According to the OT only the Tinetti test showed to have value in risk assessment in this patient sample and offered guidance in preparing individualized exercise programs. At the same time, it was a barrier to spent time assessing risk factors that were not assessable, were not clearly linked to falling, or were not modifiable. As described earlier, the NP and OT decided to use the latest CBO (2004) guidelines for the risk assessment, in combination with current Dutch research on fall-risk management in the PG patient population. While using these risk factors, they came to the conclusion that some risk factors were not of use, because they were either not easily assessed in this patient sample (i.e. hearing and vision); not clearly linked to fall risk in this sample (i.e. age and weight loss); or not modifiable (i.e. age, gender, and cognitive impairments). Even though weight loss is a sign of worsened general health condition, this risk factor is especially linked to increased levels of injuries sustained during a fall (CBO, 2004). This posed a barrier to assessing all residents in a timely fashion, which resulted in the researchers not being able to assess all residents in period 1.

**Facilitating factors:**

After period 1, the NP and OT decided to stop assessing factors such as: weight loss, age, gender, hearing or vision impairments. The expedience of the assessment was now optimal and it functioned as a facilitating factor to be able to quickly identify fall risk factors that would be of use in the discussion on possible interventions. The strategy of regular cerumen-impaction screenings for all PG residents, as proposed by a fellow NP, was not implemented during the PAR-project, but was incorporated in the recommendations in this report.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Facilitating factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time spent on using inappropriate assessment tools</td>
<td>• Targeting risk-factors that are easy to assess, clearly linked to falling and modifiable</td>
</tr>
<tr>
<td>• Time spent on assessing risk-factors not easy to assess, not clearly linked to fall-risk, or not modifiable</td>
<td></td>
</tr>
</tbody>
</table>

**3.3 Phase three -- intervention (February - May, 2011)**

**Aim:**

In phase three we aimed to implement tailored multidisciplinary, multifactorial fall prevention interventions for all residents at risk of falling of the two PG wards.

**Approach:**

- At the consultant team meetings fall prevention strategies were drafted for each individual at risk of falling. The consultant team would get together on average about once a month. At these meetings the NP and OT would describe their findings on the risk assessment. The NP would run the meetings and have the forms ready to describe details on fall history, medication regimen, current treatment plans and co-morbidities. Each case would be discussed with the specialist geriatric medicine and OT, and recommendations for multifactorial risk factors, targeted by the multidisciplinary team were drafted for each individual.
- The recommendations were communicated to the appropriate disciplines. After the meetings, the NP would relate the risk factors and recommendations to all other staff, including care staff, by reporting the findings and recommendations in the electronic patient records (see appendix
C for an example). The NP would discuss the issues with the ward’s physician and nurse assistant during the weekly doctor’s round or with the NP of the other ward. The OT would discuss the findings with the physiotherapists of both wards if needed or would go back to make adjustments to chairs, shoes and environment as recommended, and report accordingly.

- Staff training: schooling was offered (March 21, 2011) by the OT and NP to care staff of both wards to increase awareness on the fall risk factors and the steps to take in order to work on fall prevention (see appendix D for the PowerPoint slides).
- Family education: the NP wrote a separate education plan on behavioral changes in family members believes on the topic of restraint use. The NP and the SGM offered a short information session (May 23, 2011) on fall prevention and minimizing restraint use for family members of both PG wards.

Role of the NP:

- As co-health provider, the NP’s tasks were to implement nursing and medical interventions on risk factors identified for all residents at risk of falling of one of the two PG wards. The colleague NP was responsible for treatment planning of the other PG ward.
- As advisor, the NP’s tasks were to give advice on the approach to fall treatment to all involved disciplines, to provide schooling for care staff and education for family members.
- As expert, the NP’s tasks were to research evidence based interventions and evaluate the outcome measures (e.g. fall-rate and treatments being multifactorial and multidisciplinary). The NP’s task was to systematically analyze the barriers and facilitating factors to the treatment phase.

Results:

Participatory action research - a circular process:

During the six-month period of the PAR-project, we had four rounds of implementing and evaluating fall prevention interventions. After each consultant team meeting, the recommendations were passed on to the appropriate disciplines by the NP and OT and interventions would be implemented accordingly.

- **Intervention round 1** ran simultaneous to assessment period 2 from February 16 till March 16
- **Round 2** ran simultaneous to period 3 from March 16 till April 6
- **Round 3** ran simultaneous to period 4 from April 6 till May 6
- **Round 4** ran from May 6 till finishing this master’s thesis report on June 1

Pre-existing fall prevention strategies:

We found that pre-existing protocols and procedures already encompass a fall preventive measure. Regular blood pressure controls, for example, which are done once every three months for all residents that use blood pressure medication at this nursing home, is a way of preventing falls. The medical team evaluates the BP controls during the weekly doctors’ round. During the PAR-project we added the standard of care that the team should ensure that blood pressures do not fall too low (i.e. SBP <90 or DBP <60) for ambulatory residents. Continuous assessment of the fall-risk for these residents was implemented by means of this standard protocol. Another example of a fall prevention measure, which is already in place by means of a standardized procedure, is that of infection screening and treatment (urinary tract infection or other) for residents suspected of having an (acute) delirious episode when experiencing behavioral changes. See table 8 for a list of targeted risk factors and corresponding interventions.
Table 8. Intervention strategies that correspond to the targeted risk factors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Interventions</th>
</tr>
</thead>
</table>
| Ambulatory:                           | • Tinetti test or observation (strength and mobility screening)  
|                                       | • Blood pressure evaluation                        |
| Risk medication:                      | • Lab evaluation                                  
|                                       | • Blood pressure evaluation                        
|                                       | • Medication screening                             
|                                       | • Medication adjustments                           |
| Mobility or balance problems:         | • Movement sensor                                 
|                                       | • Blood pressure evaluation                        
|                                       | • Medication adjustments                           
|                                       | • Restraints                                      
|                                       | • Exercise                                        
|                                       | • Shoe adjustments                                
|                                       | • Adjusted seats and shower chairs                
|                                       | • Hip guard                                       |
| Behavioral problems:                  | • Medication screening                             
|                                       | • Medication adjustments                           
|                                       | • Behavior observation                            
|                                       | • Staff or family intervision on behavioral disturbances 
|                                       | • Consult with psychiatric NP                      |
| Co-morbidities posing risk besides cognitive impairments (e.g. epilepsy, cardiac disease with hypotension: SBP <90 or DBP <60, infection causing delirious episodes): | • Medication screening                             
|                                       | • Medication adjustments                           
|                                       | • Urine analysis                                  
|                                       | • Delirium observation scale (DOS)                 
|                                       | • Antibiotics treatment                           |
| Hearing impaired:                     | (Recommended: cerumen-impaction check and ear irrigation) |
|                                       | (Recommended: consult with audiologist)            |
| Vision impaired:                      | (Not a targeted risk factor)                       |
| Weight loss:                          | (Not a targeted risk factor)                       |

Targeting fall-risk factors:

Not all risk factors were targeted in this project. Stimulating the use of the vision or hearing aid, while not knowing if the aid is sufficient, was something the consultant team did not prescribe to as being a useful fall prevention strategy. In some cases the aid was found to be a hazard for the resident with a fall history. In one case the resident’s family was asked to reorder a pair of glasses. The wife was hesitant at first, as this was expensive to do. We recommended that she get him his glasses. Once the glasses were in use, the glasses got lost and were not found again. This
example illustrates how difficult it can be to ensure that residents with severe cognitive impairments use an aid that might make transfers safer for them. The OT had called a center for vision assessment (Visio) and asked them to assist in training staff in working with vision impaired dementia patients. They offered to provide us with information, but stated that they had no expertise on vision screening in cognitively impaired individuals. The idea of ear irrigation for residents with cerumen-impaction and consults with the audiologist was added to the list of recommendations for treatment in chapter 6.

**Risk medication:**

One of the major risk subgroups we targeted were the residents with risk medications. For 38% (n = 10) of the 23 residents that were eventually treated, we adjusted part of their medication regimen across the implementation rounds. In table 9 we listed these (n = 10) residents and described the medication adjustments that were made as a fall-risk management measure. We targeted this risk factor by doing a medication screening for all residents that were treated for fall-risk (N = 23). In some cases (n = 3) we did lab evaluations in order to measure blood levels of medications such as Depakine and Clozapine (see table 10 further down).

**Table 9. Residents (N=10) that had medication adjustments in rounds (R) 1 - 4 and the number of falls (F) that were reported on**

<table>
<thead>
<tr>
<th>N = 10</th>
<th>F</th>
<th>R 1</th>
<th>F</th>
<th>R 2</th>
<th>F</th>
<th>R 3</th>
<th>F</th>
<th>R 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Stop Oxazepam</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>B Case of Mr. D.</strong></td>
<td>11</td>
<td>Reduce Haldol</td>
<td>Reduce Lisinopril</td>
<td>7</td>
<td>Stop Lisinopril</td>
<td>Stop Oxazepam</td>
<td>Stop Haldol</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>Reduce Clonapine</td>
<td>Start Depakine</td>
<td>2</td>
<td>Stop Oxazepam</td>
<td>Start Lorazepam</td>
<td>2</td>
<td>Stop Depakine</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>(Delirious episodes w/ infection) Antibiotics treatment</td>
<td>1</td>
<td>Stop Diovan</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0</td>
<td>Stop Cipramil</td>
<td>0</td>
<td></td>
<td>1</td>
<td>(Increased restlessness at night) Start PRN Temazepam</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>F Case of Mrs. O.</strong></td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td>1</td>
<td>(Delirious episodes w/o infection) Start PRN Haldol</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
<td>Reduce Oxazepam</td>
<td>Increase Clozapine</td>
<td>3</td>
<td>Stop Oxazepam</td>
<td>Start Lorazepam</td>
<td>1</td>
<td>Stop Lorazepam (Later on we found out that a medication error had occurred</td>
</tr>
</tbody>
</table>
A multifactorial approach means targeting several different risk factors at a time in the assessment and treatment strategies. For example, of the 12 residents that were treated at the end of assessment period 1 (group A), and the 11 new residents that were treated at the end of assessment period 2 (group B), all (N = 23) residents received interventions that targeted general risk factors (by means of including fall prevention goals into the care plan and by filling out the Careyn risk analysis and fall-risk screening forms), and specific fall-risk factors (by means of screening the medication regimens). Of the residents in group A that were treated (n = 12), in terms of medical interventions, 50% (n = 6) received medication adjustments, 40% (n = 5) received blood pressure evaluation, 17% (n = 2) received antibiotics treatment for infection causing delirious episodes, and 8% (n = 1) received a visit from a consultant psychiatric NP because of behavioral disturbances. See table 10 for an overview of all treatment interventions grouped by discipline and period.

A multidisciplinary approach means that several different disciplines are involved in assessing risk-factors and implementing interventions that fall within their scope of practice. All (N = 23) residents received medical and nursing interventions. However, not all residents received treatment interventions from disciplines such as the paramedical team or the psychologist. For example, 58% (n = 7) in group A, and 64% (n = 7) in group B received staff group-discussion (intervision) sessions on that resident, or consultant meetings with that resident’s family by the psychologist. Eight percent (n = 1) in group A, and 18% (n = 2) in group B received individualized exercise programs by the physio-/occupational therapy department. Table 10 shows how often the different interventions were used and what disciplines were involved.

Table 10. Number of residents treated, disciplines involved and types of interventions

<table>
<thead>
<tr>
<th>Number of residents treated after consultant team meeting on February 16 (group A):</th>
<th>N = 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions:</td>
<td>Nursing:</td>
</tr>
<tr>
<td></td>
<td>Fall prevention care planning</td>
</tr>
<tr>
<td></td>
<td>Risk screening</td>
</tr>
<tr>
<td></td>
<td>Urine analysis</td>
</tr>
<tr>
<td></td>
<td>Medical (physician/NP):</td>
</tr>
<tr>
<td></td>
<td>Medication screening</td>
</tr>
<tr>
<td></td>
<td>Blood pressure evaluation</td>
</tr>
<tr>
<td></td>
<td>Lab controls</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Consultant psychiatric NP
万个
Antibiotics treatment for infection
(resolving delirious episode) 2

Psychologist:
万个
Behavior observation 1
Staff or family discussion on
behavioral disturbances 7

Physio/occupational therapy:
万个
Movement sensors 2
Tinetti test or observation (strength and mobility screening) 7
Restraints 2
Exercise 1
Shoe adjustments 1
Adjusted seats and shower chairs 1
Hip guards 2

Number of residents treated after consultant team meeting on March 16 (group B): N = 11

Interventions:
Nursing:
Fall prevention care planning 11
Risk screening 11

Medical (physician/NP):
Medication screening 11
Blood pressure evaluation 8
Lab controls 1
Medication adjustments 3

Psychologist:
Staff or family discussion on
behavioral disturbances 7

Physio/occupational therapy:
Movement sensors 6
Tinetti test or observation (strength and mobility screening) 6
Restraints 2
Exercise 2
Shoe adjustments 1
Adjusted seats and shower chairs 1

Total number of residents treated in the PAR-project: N = 23

万个
These are actual treatment interventions compared to interventions that enabled us to assess actual cause of certain risk factors (i.e. blood pressure evaluation or urine analysis).

Quality of care:

The approach to care changed. At the start of phase two, the residents of both PG wards were being assessed for fall-risk. This was not done previously at nursing home de Plantage. When discussing the issue of signaling changes in mobility and balance or behavior, we found that the physician, PT, OT and NP departments did not hear of changes in time well enough to start preventative measures. Once the teams heard of there being a problem, the resident would often already be unable to walk independently, or had experienced severe injury during a fall. Starting the PAR-project meant that residents were now assessed and observed closely by NP, OT and care staff. The care teams started providing quality care concerning fall-risk assessment (phase two) and treatment (phase three) right off the bet and continued to do so for the six-month period...
of the PAR-project. The fall rate went down from 20 falls a month, to three falls a month – considering that the periods between the meetings (periods 1 – 4) roughly were about a month long. As shown in the table below (Table 11), the number of fall incidents decreased by each treatment round. In table 11 you will see that some of the residents that were treated for being “at risk” of falling (N = 23) needed to be re-assessed and treatment options were adjusted as they had experienced a new fall incident. These numbers are listed in parenthesis and not added in the total.

As mentioned in paragraph 3.2, we were unable to assess Group B during assessment period 1. The fall-rate of period 1 and 2 for group B were included to the total number of falls and residents that had fallen in period 2. Therefore, the numbers are skewed in period 2. The fall-rate may seem to have increased in that period. However, what had increased were the number of residents and fall incidents we reviewed. Regardless, there was a noticeable decrease in residents with recent fall incidents and a decrease in number of falls from the start of phase two till six months later. According to the 2010 MIC reports, the one ward had an average of 12 falls a month, of which the highest fall-rate was 19 falls in November, 2010 and the lowest rate was 3 falls in February, 2010. The other ward had a fall-rate of an average 5 falls a month, of which the highest rate was 10 falls in April, 2010 and the lowest rate was 2 falls in January and June of 2010. Because of these fluctuating rates, it is not possible to say at this point in the evaluation process that our fall-prevention strategy had a different effect from the pre-existing approach.

The project design did not allow for sufficient control of influencing factors. The aim of this research project was not to establish proof of an effective approach, or establish correlation between intervention and outcome. We aimed to evaluate barriers and facilitating factors to the implementation process of evidence based guidelines to fall prevention in the PG population.

Table 11. Number of residents at risk, number that fell, number of falls and number that were treated in group A and group B and across rounds 1 - 4

<table>
<thead>
<tr>
<th></th>
<th>Round 1</th>
<th></th>
<th>Round 2</th>
<th></th>
<th>Round 3</th>
<th></th>
<th>Round 4</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
<td>At risk:</td>
<td>12</td>
<td>..</td>
<td>11</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>23</td>
</tr>
<tr>
<td>Fell:</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Falls:</td>
<td>20</td>
<td>10</td>
<td>17</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>Treated:</td>
<td>12</td>
<td>(3)</td>
<td>11</td>
<td>(4)</td>
<td>(2)</td>
<td>(2)</td>
<td>(1)</td>
<td>23</td>
</tr>
</tbody>
</table>

Communication:

Relating the recommendations to all other staff was not always possible. The NP found that there was a pre-existing lack of communication. The nurse assistants and psychologist stated that they experienced a lack of communication especially between the nurse assistants and the medical team, and the psychologist and the medical team. This was affirmed by the NP and physician and it was emphasized that it is important to discuss issues more often with the resident’s FRN A and with the psychologist. However, the manner in which this can be improved did not become clear. The FRN A’s are required to check the electronic patient records on developments, but this seemed to not ensure that the FRNA stayed informed at all times. The FRNA were not always present while the medical team was present and this prevented the two teams from discussing issues immediately. It was decided that the group would continue to brainstorm on this issue and try to come up with a solution. Both NP’s and the psychologist continued to discuss fall risk related issues through email, and with the FRN A when present during the weekly doctors’ round. They continued to emphasize the need for the FRNA’s to have their own email addresses to management.
Staff training:

Of the approximate 50 staff members at both PG wards, 26 members participated in the schooling session that was offered by the NP and OT. During the schooling session a PowerPoint presentation was used to walk the care staff through the risk factors of the PG population, and the steps to take in order to work on fall-risk management (see appendix D). At the end of the session, the participants were asked to highlight the risk factors in a case example. They were then asked to fill out the Careyn analysis form and Careyn fall-risk screening tool and the outcomes were discussed right afterwards.

The schooling resulted in the introduction of a three-step strategy to be used by all disciplines. These steps can be summarized as being: Step 1: looking at the risk factors; Step 2: implementing a multifactorial, multidisciplinary approach; and Step 3: evaluating the outcomes. In step 1 the care staff are asked to look at fall history; whether the resident is dependent in ADL; whether the resident is independent in transfers; and the medications the resident is using that might place him or her at greater risk of falling. In step 2 the care staff is asked to do an environmental check to assess hazards; to educate family on risks; to adjust care giving to the pace and needs of the resident; to check movement sensors; vision; hearing; shoes and assistive devices for safety; and to stimulate activities. In step 3 the care staff (and in specific the FRNA’s) are asked to evaluate the care of the residents regularly on whether multiple disciplines were involved, multifactorial interventions were started, the fall rate has increased or decreased, and whether the overall MIC reports have changed.

The schooling was well received and experienced to be relevant to very relevant by 18 of the 21 participants that had returned the questionnaires. The topic on which a lot of the participants had wanted more information on, according to the questionnaires, was information on specific risk medications. What the participants had mostly learned was that they should inform a NP or physician after a fall, even if injury is not suspected.

Family education:

In response to the requests coming from family members and care staff asking to fixate the resident with a high fall rate, the NP wrote a short education program for family and nurse assistants on minimized restraint-use and the new Law (Wet Zorg en Dwang). Parts of this program will be implemented shortly after the PAR-project has ended. The NP and the SGM did offer a short information session on fall prevention and minimizing restraint use to family members of both PG wards, but due to scheduling issues this occurred near the end of the PAR-project.

Reflection on barriers and facilitating factors:

Barriers:

Lack of time posed a barrier to assessment and treatment by the PT and OT department as we described in paragraph 3.1. The time allocated to PT and OT is limited to a number of minutes per week per resident. Because of this limited amount of time, PT and OT could spend only a few hours a week observing the residents during ADL or other activities. This is why, for example only seven of the 12 “at risk” residents in group A and six of the 11 “at risk” residents in group B were assessed using the POMA test or observation (see table 10).

The limited time was also due to a staffing shortage. Lack of staff personal posed a barrier because of the added workload. This nursing home has a multitude of disciplines available and each discipline has a number of hours per week allocated for the PG wards. Fall-risk management interventions could be implemented on a weekly basis - albeit that attention is needed to use the limited hours efficiently. However, the temporary lack of staff within the departments during the
PAR-project created a deficit, as hours needed to be used for other tasks. This was a major barrier for OT and PT interventions, as both departments lacked staff personal to cover all hours.

Cognitive impairments posed a barrier to targeting risk factors. One of the barriers to working with cognitively impaired residents and promoting the use of assistive devices or sensory aids is that the residents are not always able to remember to use them. In addition to the example given above, where the resident kept losing his glasses, another example is that of a woman who would forget to use her walker. The care staff were able to remind her to use her walker, but in some cases the resident was left unattended. During dayshifts one PG ward has 3 to 4 nurse assistants working at a time. At nightshifts there is one nurse assistant working at a time. The ward houses up to 24 residents of which, during the time of this project, one ward had 12 residents that were independent in making transfers or were ambulatory. It was therefore impossible during certain shifts to not leave residents unattended.

Having several team structures posed a barrier to good communication. Several temporary teams were put into place for the sake of the PAR-project: a consultant team (NP, OT and SGM) to offer recommendations on treatment planning; and an assessment team (OT, NP and nursing assistants) to make an inventory of the risk factors. Several teams were already in place: the care team (physician, NP and nursing assistants or FRNA) to instigate and evaluate the medical and nursing care plans; and the wards paramedical teams (OT and PT) to suggest changes in exercise training and safety measures (i.e. movement sensors, adjustments to shoes and chairs). These different teams were somewhat linked during the PAR-project as the NP started communicating with and through these different structures. However, information easily got lost between the teams. One factor that played a role in the ill communication was that at the multidisciplinary team meetings, which occur once every six months for each resident, not all disciplines are always present. This is because the paramedical disciplines are only invited by the nurse assistant once they are involved in the planned care. At the same time, the nurse assistant that is present at the doctors’ round, is not necessarily the nurse assistant that is involved as FRNA for the resident being discussed.

Last, the psychologist and social worker formed an additional team and kept falling outside of the information dissemination as they were not part of any of the other teams and were rarely invited to a multidisciplinary team meeting. The efforts in which the NP tried to keep the psychologist involved was through stopping by her office on different occasions and informing her of general and specific cases concerning the project. Unfortunately, the NP did not manage to get the psychologist actively involved but until the care team manager arranged for a meeting between the physician, both NP’s, psychologist and a nurse assistant from each ward. They discussed the concerns related to the fear of increased behavioral disturbances and the medication adjustments that were implemented as fall preventative measures.

The question was whether the behavioral disturbances and aggression should be more important topics to address than fall risk -- in case both are present. According to the nurse assistants, the level of aggression can be great in this patient population and staff and other residents run the risk of getting hurt. The NP’s and physician did not deny this fact, and stated that this topic should be part of the decision making process. At the same time, there should be room to assess whether a medication is still needed for a resident, and this might take two or more weeks to figure out while reducing or discontinuing the dose. The psychologist was in agreement with the fact that most psychopharmaca should be used only temporarily and have great, often permanent side-effects.

The psychologist mentioned that she missed the continued multidisciplinary communication and that she noticed that she is not informed enough of changes. When asked who should be responsible in informing her, the psychologist said that medication changes (that will affect mood, behavior and cognition) should be forwarded to her by the NP or physician on residents that the psychologist is involved on. On other developments, the FRNA should keep the psychologist better informed.
Misconception on effectiveness of restraint use formed a barrier to use alternative fall prevention measures. The NP found that nurse assistants’ and family members’ lack of understanding on use of (pharmaceutical) restraints and the negative side-effects posed a barrier to the improvement of care on fall prevention by means of alternatives to restraint use. Additionally, the PT department identified the need for them to start looking for alternatives to the use of restraints to offer moments of rest for residents that wander obsessively. For these residents it is not recommended to add on more exercise programs as exhaustion is the main fall-risk factor. However, PT staff mentioned that they currently have limited resources on, and knowledge of alternatives to restraint use.

**Facilitating factors:**

Recognizing fall prevention strategies in pre-existing protocols and procedures was a facilitating factor to the implementation of fall prevention interventions. The NP, OT and SGM found ways to fine-tune pre-existing protocols (such as blood pressure or lab evaluations) and used these in their recommendations for fall prevention care planning. This way, the disciplines experienced less added workload, as the procedure were already implemented on a regular basis.

Offering staff training and family education were facilitating factors to raising the awareness of the problem and developing clinical judgment skills or decreasing misconceptions on restraint use. The NP found that after the schooling session, the nurse assistants would come to her to inform her of fall related events more easily, but this continued to be a point of improvement. Because the family education session was scheduled near the end of the project, the research team was unable to describe the results in this report. However, during the session we had 19 participants. One family member’s opinion on the fall prevention care for her father was that she felt that she was kept informed well by the nurse assistants. Yet, she was not able to say what different disciplines had gotten involved in the fall prevention care for her father, besides the physician who had adjusted his medication.

### Barriers

- Lack of time
- Staffing shortage
- Cognitive disabilities
- Lack of communication between teams
- Many different team structures

### Facilitating factors

- Recognizing, fine-tuning and using pre-existing fall prevention strategies
- Raising awareness and resolving misconceptions through staff training and family education

#### 3.4 Phase four --- evaluation (April - June, 2011)

**Aim:**

In phase four we aimed to evaluate and reflect on the processes of phases one through four and distill the findings in this master’s thesis report. Additionally, we aimed to come to agreements on an organizational level to ensure continuous implementation of the already existing and innovative approach to fall prevention as developed through this process in, combination with the Blijf Staan project approach. These three approaches complimented each other well.

**Approach:**

- The OT, NP and SGM wrote reflection reports on phases two and three. For these reflections they used the STARR method (situation, tasks, activities, results and reflection) method. The project outcomes and reflections are described in this chapter.
- We evaluated the pre-existing fall prevention strategy. For this we analyzed the two Careyn risk assessment tools during the schooling session.

- After reflecting upon the different team structures (paragraph 3.1 and 3.3) and evaluating the Careyn tools and other existing assessment tools (see paragraph 3.2), the NP and Blij Staan project manager collaboratively designed a flow sheet (see appendix E). The goal of this flow sheet is to have a guide to all staff on how to work on fall-risk management while combining the PG specific approaches of the PAR-project with the existing approaches. The work process (as described in the flow sheet) will be evaluated six months after implementation.

- The NP ran a short pilot project to try out electronic fall rounds.

- The NP met with one of the two nurse assistants that had joined in the assessment team and interviewed her on the process barriers and facilitating factors.

**Role of the NP:**

- As expert, her tasks were to research the project outcomes, to guide the disciplines in reflecting on their own practice and to ensure that the innovative approach to fall prevention would be implemented permanently and successfully at the facility. The NP’s task was to systematically analyze the barriers and facilitating factors of the overall project.

- As professional, her tasks were to engage in the process of self-directed learning by means of the reflective process on the situation, tasks, activities, results and own reflections.

**Results:**

**Project outcomes:**

The project outcomes are compiled and analyzed in this thesis report. The results of each the phases are listed in chapter 3. In the reflection sections the barriers and facilitating factors are described. These will be discussed in more detail in chapter 5. Additional results in phase four are described in this paragraph.

**Evaluating Careyn assessment tools:**

The schooling session provided a means to introduce and evaluate the Careyn assessment tools. We had found that, even though the Careyn risk assessment tools had been implemented in October of 2010 and were meant to have been in use by February 2011, none of the residents had these forms filled out by then. Therefore, we decided to use the forms in the schooling session in order to provide assistance in understanding when and how to use these forms, but more importantly, in order to evaluate the value of the outcomes of the forms as these forms were modified versions of exiting evidence based assessment tools (see paragraph 2.1).

The Careyn risk analysis form is a tool that is used by the nurse assistant to quickly identify risk on the areas of: skin breakdown; incontinence; medication use; depression; and falls. This tool was created by a Careyn staff member and developed in order to comply with the requirement that the insurance company had placed on receiving overall coverage (see section on financial incentive under facilitating factors in paragraph 3.1). Once someone has a high risk in any of these areas, the nurse assistant is asked to fill out a separate screening tool for that area. The section on falls in the risk analysis form and the risk screening tool (on fall-risk only) were used during the schooling session by all participants using one case example. Of the 26 participants, 12 completed risk analysis forms and 9 completed fall-risk screening tools were returned.

Before filling out the form and tool, the NP had given specific instruction to say "no" or score zero points for any subject for which there was no information listed in the case. All scores were then compared as a group. In table 12 the outcomes of the Careyn risk analysis form are listed. The form is supposed to be used in all Careyn facilities, including home health and assisted living facilities. Residents in some of these facilities are able to answer the questions such as: "Do you
easily trip?" However, residents with cognitive impairments in all of the Careyn psychogeriatric department are often not able to answer these questions.

Table 12. Outcomes of (N=12) participants that filled out the Careyn risk analysis form (falls portion only) by using the information given in a case example

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>No answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you easily trip?</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Do you sometimes fall?</td>
<td>12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Are you able to easily move about in your home?</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Did you fall in the past 30 days?</td>
<td>12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Conclusion: increased risk</td>
<td>11</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Additional action needed?</td>
<td>10</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

The fall-risk screening form, for which the outcomes are listed in table 13, is similarly used in all Careyn care facilities. Not surprisingly, when using these forms in the cognitively impaired patient population, the nurse assistant is required to answer the questions for the resident. The nurse assistant is advised to discuss the questions with the family, but this approach is not implemented properly yet, and should get more attention. Because of the generalized aspect of these forms, a PG specific risk assessment was not incorporated into the pre-existing Careyn fall prevention approach.

Table 13. Outcomes of (N = 9) participants that filled out the Careyn fall-risk screening tool by using the information given in a case example

<table>
<thead>
<tr>
<th>Question</th>
<th>None*</th>
<th>Some*</th>
<th>Very*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall history**</td>
<td>-</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Co-morbidities</td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Problems ambulating***</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Mental status problems**</td>
<td>-</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Vision problems</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Risk medication***</td>
<td>7</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Orthostatic hypotension</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Problems with dizziness</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Toileting at night**</td>
<td>9</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

* Possible answers in this tool differ. For example, for fall history possible answers are a score of 0 or a score of 25. Possible answers for co-morbidities are a score of 0 or a score of 15. Whereas for ambulatory problems possible answers were three fold (a score of 0, 10 or 20) and so on. Therefore, we decided to use: none, some or very, for this table so that the answers could be compared.

** These questions were answered unanimously.

*** For these questions there are 3 possible answers, for the other questions there are only 2 possible answers.

There were a lot of discrepancies in filling out the assessment tools. We found that the forms had not been filled out identically, which resulted in noteworthy discrepancies in outcome scores. Of the fall-risk screening tool, for example, the lowest score was 65, which implied a low fall risk, even though the resident in the case example had broken her nose after a fall. The highest score was 115, which implied a high fall risk.

As a group we then discussed the manner in which the items of the screening tool had been scored. We found that, for the items for which they had no, or limited information in the case
example, the participants had projected the need for a higher or lower score, depending on the clinical judgment of the nurse assistant. Some participants decided to score higher, even though they did not have enough information on items such as ambulatory pattern \((n = 5)\), orthostatic hypotension \((n = 6)\) or dizziness \((n = 3)\). On the subject of toileting at night, there was no information available in the case example, yet, everyone scored identically. Compared to dizziness, on the other hand, a subject which equally had no information available on, the participants were not unanimous in their answers. Some \((n = 3)\) said yes, the patient experiences spells of dizziness, and some \((n = 6)\) said no. These subjects (dizziness and toileting at night) were not listed as risk factors during the schooling session.

We found that these risk assessment tools could not be used to identify level of risk in the case example during the schooling session. After discussing this finding with the consultant team together with the Blijf Staan project manager, we came to the conclusion that these tools cannot be used as fall-risk predictors or level of risk identifiers. However, these tools could still be used to inventory potential type of risk. Therefore, we decided to link each risk factor in the fall-risk screening tool (see table 13) with the appropriate discipline or department. The nurse assistant should approach these disciplines if a resident has a positive score on that subject. For example: fall history; co-morbidities; mental status problems; vision problems; risk medication; orthostatic hypotension; and problems with dizziness should be discussed with the physician or NP. Problems with ambulation and toileting at night should be discussed with OT or PT, whereas mental status problems should also be discussed with the psychologist. Because not all important fall-risk factors that should be assessed and targeted in the PG population are part of the Careyn fall-risk screening tools, the care teams should be familiar with the CBO guideline to assess those risk factors that are common in this patient population. Ongoing education is therefore crucial.

**Flow sheet:**

An integration of the different work processes (on the level of care giving and management) for all disciplines involved was depicted in a flow sheet. The flow sheet was a result of the Blijf Staan project manager and the NP collaborating on how to implement the innovations permanently and successfully at the different homes and wards. They managed to depict the tasks and disciplines in a clear, easy to follow flow sheet and discussed the implementation of it with the quality care managers. Having this flow sheet, and having the fall prevention strategies outlined clearly, meant that there was a standard of care concerning fall prevention throughout the Careyn facilities. In the flow sheet there are activities related to prevention, intervention, and evaluation, described for each discipline. It integrates individual risk assessment and treatment with tasks concerning raising the overall awareness, checking for environmental hazards and education. This flow sheet includes the Blijf Staan module goals, the pre-existing approaches, and incorporates a fall-risk management approach specific towards the PG population needs and their risk factors. As identified in chapter 1, the PG population is at greater risk of falling than other residents in nursing homes, or community dwelling residents (CBO, 2004). It is therefore imperative that fall prevention strategies are tailored to the specific risk factors in the PG patient population.

**Electronic fall–rounds:**

Ongoing fall-rounds by the NP are a way to ensure fall prevention in the high risk PG patient population. The NP had set out to improve fall prevention strategies specifically aimed at the high risk PG patient population. By comparing the 2009 and 2010 MIC forms from all seven wards, the NP found that at the two PG wards, the fall rate was highest. She and the OT also found that the fall rate could be up to twice a day for some of the PG residents. In their assessment phase, they would often feel the need to check the electronic patient records on a weekly basis in order to keep up with the “fallers”. As the consultant and assessment team structures were only put into place temporarily for the sake of doing research, and would not continue to exist after the PAR-project, it was important to implement the flow sheet, and clarify disciplinary roles and tasks.
Both NP’s of the PG department decided to run a short pilot project to see how ongoing fall-rounds would ensure timely fall prevention actions, and would promote the continuity of care for the PG residents. They designed the so-called “electronic fall-rounds”. Once every two weeks the NP’s would pull up chartings with the term “falls” in the subject heading and would take the necessary steps to implement a multifactorial, multidisciplinary fall prevention strategy (if none was in place) in the way the consultant team had done.

From comparing the 2011 MIC forms with the number of falls that had been reported on in the electronic records during the time of the PAR-project, the NP found that there were less MIC forms filled out than electronic reports written. For the 59 fall reports that were found in the electronic patient records, only 42 MIC forms were filled out. This supports the need for the NP’s to use the electronic records in assessing fall history on a regular basis and coordinating the continuity of care. Therefore, the primary task that was added to the flow sheet, which embodies a specific PG population focused fall-risk management approach, is that of the bi-weekly electronic fall-rounds conducted by the NP’s.

**Nurse assistant interview:**

The increased awareness was viewed as beneficial by the care staff according to the nurse assistant that was interviewed by the NP. This nurse assistant had joined in the assessment team, and found that the raised awareness on the subject of falls had contributed to an increase in quality of care on her ward. She stated that the residents were still at high risk of falling, but that she and her colleagues were more easily alerted to risk factors as they were reminded of them in the schooling session, and asked to assess them by means of the risk analysis and screening tools. She did not have the sense that fall incidents had decreased. If she had to formulate what was the most influential factor to the high fall rate at her ward, she would say that the ward is too hectic: too many residents; too many of the residents are ambulatory and wandering; and too often hazardous objects standing in the hallways. Nursing home de Plantage is planning to adjust the two PG wards by dividing each ward up into two small-scale residential care units. Now the wards house up to 24 residents each, and exist of one large living room and open kitchen. There is a circular hall-way with doors out to the patio. The two wings of each ward go out in separate directions with eight single and two double rooms on each side. The wards would easily be divided up into two smaller units with two living rooms and two kitchens.

**Reflection on barriers and facilitating factors:**

**Barriers:**

The fall-risk management approach, that was implemented prior to the start of the Blijf Staan and PAR-projects by means of the Careyn risk analysis form and the fall-risk screening form, is meant to target all Careyn clients (in-patient and out-patient clients). This encompasses a hugely diverse set of risk populations (i.e. community dwelling elderly, somatic, rehabilitation, and psychogeriatric populations). This posed a barrier to adapting the fall-risk management approach to population-specific needs. For example, the fall-risk screening tool does not include all important fall-risk factors that play a role in the in-patient PG population.

**Facilitating factors:**

The flow-sheet (appendix E) that was developed by the NP and Blijf Staan project manager, was a way in which the researchers knew how to move beyond the existing approach (the Careyn forms), while mapping the responsibilities and actions of each discipline, and implementing a PG specific intervention -- that of the bi-weekly electronic fall rounds done by the NP. Because a number of different Careyn facilities house PG residents, albeit in small-scale residential facilities (kleinschalig wonen) or nursing wards, the Careyn-wide approach to fall-risk management could be tailored to the needs of the high-risk PG population by means of the flow-sheet and this should
become a facilitating factor to the implementation process of the findings of the PAR-project. A draft version of the flow-sheet was included in this document (appendix E), but the final version is still being completed and has not yet been implemented at the Careyn care organization.

The electronic fall-rounds were mirrored after the wound rounds already done by all NP’s at this facility. The wound rounds are based on a weekly evaluation of the wound care, and this is done by checking the actual status of the wounds and then writing up a short wound evaluation report. If needed, changes can be made to the wound care plan. For the fall-rounds, the NP needs to evaluate the fall history and the continuity of care concerning fall-risk management. This is done by checking the electronic records once every two weeks. Having gathered the necessary information, the NP writes up her short report and gets disciplines further involved. In her role as adviser, she may offer recommendations on the care approach to the different disciplines.

The outcome of the pilot project was that it was not time consuming; a fall round of one ward (housing 24 residents) would take the NP about five minutes to screen for fall history. In case there were new fall-incidents reported, the NP would need about 30 minutes to gather information, send emails to the appropriate disciplines and write up the process notes. The NP’s found that they were able to include these tasks into their daily schedule. The fall-rounds became facilitating factors to implementing and evaluating the fall-risk management approach on an individual level as well as on an organizational level. Because the wards noticed the reoccurring fall-risk progress notes, the awareness on the subject stayed current. Because the disciplines kept being asked to be involved in specific cases, their awareness of the problems stayed current. Because the NP kept evaluating the continuity of care, she was able to identify lack of knowledge on specific risk factor areas and could include this in her teaching. The standard of care that was used to evaluate the quality of care concerning fall-risk management was that 1) More than one discipline needed to be involved, and 2) More than one risk-factor needed to be targeted. Hence a multidisciplinary, multifactorial fall-risk management approach for the in-patient PG population would be guaranteed.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Facilitating factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population-wide (generalized)</td>
<td>Flow sheet</td>
</tr>
<tr>
<td>fall-risk management approach</td>
<td>Electronic fall rounds</td>
</tr>
</tbody>
</table>
Chapter 4. Two poignant case examples

In this chapter we will describe two poignant cases of residents that were assessed for fall risk and were treated accordingly. The reader is able to follow the steps we took in each of the periods and rounds in (re-)assessing the treatment plan and adjusting it accordingly. The case of Mr. D. is an example of the interventions being successful in reducing the number of falls. This research did not set out to scientifically prove that our interventions were the cause of that success, as the research model limits us to doing process analysis only, but none the less, this resident’s fall-rate decreased considerably. The case of Mrs. O. is an example of a resident where we were unable to identify the correct type of risks. This resident was left untreated, but was kept under close watch. No falls occurred during the five months, but until the very end. An awful fall happened for reasons we were unable to predict at the time. Afterwards we implemented a tool (Delirium Observation Scale) which should assist the care staff, physicians and NP’s in identifying delirium immediately and act appropriately. We also discussed the need for improved communication between the psychologist and the medical team as risk assessment on behavioral disturbances is an important factor to identifying the types of risk.

The Case of Mr. D.

Mr. D. is an 84 year old Caucasian male suffering from Alzheimer’s disease. He has been living at one of the closed PG wards of nursing home de Plantage since 2006. His wife and four children come to visit him regularly. Because of restlessness and aggravation during the move, and Mr. D not being able to comprehend the changes because of his worsening cognitive impairment, he was started on Haldol and Oxazepam right before he was admitted to the ward. Mr. D. likes to walk obsessively in the hallways, but started experiencing a greater level of fall-risk resulting in him falling ten times in 2010. During their assessment, the NP, OT and nurse assistants found that Mr. D. had the following fall risk factors: recent fall history; cognitively impaired; use of five different risk medications (Haldol, Oxazepam, Temazepam, Lisinopril, and Citalopram); ambulatory and independent in making transfers; dependent for ADL; behavioral disturbances; disturbed gait pattern (walks obsessively, balance is off, weakened muscle strength, and stiffness); low blood pressure (BP 110/70); history of vision problems and not wearing his glasses.

During assessment period 1, Mr. D. continued to fall 11 more times. He was discussed at the consultant team meeting on February 16th, 2011. The treatment recommendations that were made were: to screen his medications, to continue to control his blood pressure, to do the Tinetti observation test, and to offer him exercise training if possible. His daily activities were mapped by the care staff in order to build in moments of rest. The OT assessed the use of hip guards and the nurse assistants assessed his need for using his glasses. The physician and NP decided to discontinue his Haldol and decrease his Lisinopril dose as recommended by the consultant team. They used a schedule over a period of two weeks to reduce and stop the Haldol. OT had noted that Mr. D. would get out of bed a number of times at night, therefore a movement sensor was placed by his bed. The nurse assistants added fall risk to his care plan and the disciplines were to discuss his risk at the next multidisciplinary team meeting.

During the next period (period 2), Mr. D continued to fall 7 more times. These were half as many falls as the period before, but the length of this period was also about half as long. Blood pressure was assessed again and Mr. D. was now suffering from hypotension (BP 86/58). The physician and NP decided to discontinue the Lisinopril altogether. PT had implemented a body point belt to fixate him in a chair for short periods of time during the day (30 minutes at a time) in order to provide him with moments of rest. It turned out that the nurse assistants had a hard time stimulating Mr. D. to sit down on his own -- a side effect of long term Haldol use could be that the individual is not able to rest (a
syndrome called Acathisia). PT had also tried adjusting his shoes, as he was carrying his weight on his heels, but this had no observable effect. Despite expected aggravation, the hip guards OT wanted to implement, were accepted by Mr. D. and his wife felt that this was the main reason why his balance and stability had improved. Nurse assistants had tried for Mr. D. to wear his glasses, but they kept getting lost and his wife was unwilling to continue buying new glasses. The physician and NP reduced the Oxazepam dose at this point as it was unclear whether behavioral disturbances were still a current problem.

In the next period (period 3) Mr. D. continued to fall one more time. However, the care staff stated that his behavior was unmanageable during ADL now that the Oxazepam and Haldol had been discontinued. Mr. D. would get physically aggressive towards them and other residents. Even though Mr. D. had been discussed twice during the bi-weekly intervision meetings with the psychologist, where the care staff is assisted in managing behavioral disturbances by means of needs-driven dementia-comprised behavior interventions, the care staff found that his behavior was too dangerous and unmanageable. The physician decided to start Mr. D. on Zuclopentixol, an antipsychotic medication which can be administered in very low doses. His blood pressure was still hypotensive (106/56) and continued to be monitored as Zuclopentixol also poses a risk to decreased blood pressure. PT found that because Mr. D. would walk too extensively, offering him additional exercise programs would increase his risk of falling because of potential exhaustion. They decided to focus on offering him moments of rest by fixating him in a chair for short periods of time. For the walks outside with his wife, PT arranged for an electric wheelchair. This way his wife was able to push him without straining too much.

Over the next period (period 4) Mr. D.’s behavior was noted to be very pleasant and he has not fallen since.

In evaluating his case, the consultant team found that all factors of his fall-risk had been attempted to be managed and several different disciplines had been involved in his care concerning fall-risk and behavioral disturbances. This makes his fall-risk management strategy a good example of a multifactorial, multidisciplinary approach to fall prevention. Mr. D.’s fall-rate decreased from seven falls a month to zero falls a month in a four month period.

The Case of Mrs. O.

Mrs. O. is an 81 year old Caucasian female suffering from a mixed form of dementia (Alzheimer’s and vascular dementia). She has been living at this closed PG ward since 2009. Her children come and visit her every so often. Mrs. O. is able to ambulate independently and she frequently goes into the bathroom to wash her hands vigorously. She then leaves the water running and goes to her room where she falls asleep in her armchair. She once fell, back in 2010, and broke her hip. She was sent to the nearby hospital for surgery and was able to recover well from the events. When she was assessed by the NP, OT and nurse assistants, between December, 2010 and February, 2011, they found that Mrs. O. had the following fall risk factors: cognitively impaired; use of one risk medication (Irbesartan); ambulatory and independent in making transfers; dependent for ADL; history of vision problems and wearing her glasses.

Because there had been a pre-existing lack of communication between different members of the multidisciplinary team, the NP and physician were unaware that Mrs. O. had been monitored by the psychologist for behavioral disturbances, and possible episode of hallucinations and had been discussed in the bi-weekly staff intervision meetings with the psychologist.
Mrs. O. had been discussed once during the fall prevention consultant team meetings, but no treatment recommendations were offered. Because of the use of Irbesartan, the NP decided to keep a close watch on her blood pressures. Her BP was 130/80 then and was not concerning to the NP. Further action on medication adjustments were not instigated.

During the course of the fall prevention implementation project, the NP continued to monitor blood pressure controls and fall history of Mrs. O. on a monthly basis. All throughout the four month period, Mrs. O. had stable blood pressures and no fall incidents. Until one evening; Mrs. O. suddenly experienced a spell of delirious behavior. She was running around the ward and knocking on windows. At 0400 AM she was found on the floor in a puddle of blood. Her face had been seriously injured, and bruised, and her nose and mouth were bleeding. That night, the physician on-call ordered a one-time dose of Haldol and a restraining vest for her to stay in bed. The next morning the NP asked the care staff to do a urine analysis to rule out delirium from a urinary tract infection (UTI). She asked the physician to assist her in doing a physical exam in order to rule out fractures and to see if another type of infection (such as pneumonia or erysipelas) might be the cause of her delirium. No causes of infection were found. Mrs. O. had been lucky, as she had not injured herself too traumatically, beside the painful looking bruises in her face.

After discussing her case during a next fall prevention consultant team meeting, the SGM suggested for the nurse assistants to do the Delirium Observation Scale (DOS). This observation tool is filled out during three consecutive shifts (by three different nurse assistants) and can help to determine if behavioral changes are caused by delirium. The DOS score was clearly positive for delirium, but Mrs. O. had no acute reasons to be delirious. The NP decided to read the medical history of Mrs. O. and she found a report on her history of alcohol abuse. The physician and NP suspected that this could very well be the cause of spells of hallucinations for her (Korsakoff’s syndrome) and made a note of it in the electronic patient record. Now the NP and physician were able to plan for future delirious behavior by prescribing PRN Haldol and informing the care staff of this resident’s expected future episodes of increased confusion and restlessness. In order to prevent falls, the nurse assistants should pro-actively administer the Haldol in such cases.

Upon finalizing phase four of the PAR-project, the NP found out that Mrs. O. had been monitored by the psychologist in relation to behavioral disturbances. The psychologist had noted in the patient records, eight months prior to the fall, that hallucinations and restlessness were present and had communicated this via email to the wards physician. The physician, in turn, failed to respond. The NP did not find medical notes in the charting on the findings the psychologist had passed on to the physician.

When evaluating this case, the NP noted that the fall risk factors were incomplete at the start of the treatment phase, and that behavioral disturbances (hallucinations or delirium) should have been part of the list of risk factors. From this exemplary case we now know that it could have been very beneficial for the psychologist to have been part of the assessment team in order to alert to risk factors such as behavioral disturbances.
Chapter 5, Discussion and conclusion

In this chapter we will discuss the findings and reflections in more detail and come to relevant conclusions to the profession of the nurse practitioner in relation to implementing a fall-risk management approach adapted to the specific needs of the PG in-patient population. From analyzing the barriers and facilitating factors in each of the phases above we saw themes emerge and were able to group the conclusions accordingly.

Project aim:

The aim of this research project was to utilize evidence based knowledge on fall-risk management and implement a tailored fall prevention strategy at two PG wards. Regardless of the effectiveness of the approach, which we were not able to measure; in our opinion we were able to successfully implement a multifactorial, multidisciplinary fall-risk management approach for all residents “at risk” of falling of two PG wards.

The research questions were:

• What aspects of the current body of evidence on elderly fall prevention can be translated into fall prevention strategies tailored to the needs of the psychogeriatric in-patient population? We would answer this by saying that we were able to translate the recommended multidisciplinary, multifactorial approach to fall-risk management into strategies for the PG population. In doing so we used our clinical judgment on population specific risk factors in comparison to the recommended risk factors and reflected on interventions targeting these risk factors.

• How does the NP play a role in the process of implementing a tailored fall prevention strategy at nursing home de Plantage? The NP is competent at playing multiple, central roles because she is trained in doing research, innovate, guide and give care. The NP can assess, diagnose and treat. The NP can coordinate, increase knowledge and skills and the NP has enough leadership skills to do so. Through the process of self-directed learning, she is an independent asset to the multidisciplinary team. In a quality improvement project, these competencies come together and facilitate the integration of direct patient care, process evaluation and evidence based knowledge. More on the role of the NP is listed in paragraph 5.2 under facilitating factors to implementation.

• What are the barriers and facilitating factors to each of the implementation phases? Answers to this question are listed here.

5.1 Barriers to implementation

According to Vermeulen (2008), lack of time, added workload, and ill communication between care staff and the fall prevention teams negatively influence the implementation process of a fall prevention program. In our research project we found that these same areas predominantly posed barriers through all phases of the process.

Lack of time and added workload:

Because fall-risk management projects can easily become time consuming efforts to enhance quality care, it is imperative that participating professionals prioritize accurately by selecting the residents that are most likely to respond to the intervention (Capezuti, 2004). Even though the CBO guideline states that case-finding is futile in nursing homes, as all residents in nursing homes are at some level of fall-risk (CBO, 2004), the question on how to implement an approach that is to the point and cost-effective remains. Considering the limited number of hours for OT and PT, in addition to a temporary reduced number of staff in both departments, the implementation of a
multidisciplinary, multifactorial fall prevention strategy was reserved for those residents that would potentially benefit the most from the interventions.

The selection of the residents was based upon the clinical judgment of the disciplines involved. One of the reasons we were left to our clinical judgment was the fact that nursing home de Plantage does not have an adequate assessment tool that could help us identify levels of risk (high, medium, or low). It can, however, help us identify types of risk, and this is still very beneficial to the assessment phase. The tool is therefore used to assess which (multi-)factors, by which (multi-) disciplines should be further evaluated. The question on what resident is most at risk, remains to be determined by the expertise of the disciplines involved. Hence, the collaboration between disciplines on determining the level of risk, is unmistakably important. We recommend that adequate staffing becomes a priority for this facility as the quality of care suffers directly when there is a (temporary) staffing deficit.

III communication:

While a vast body of evidence on falls and their related risk factors in the elderly population is available, elder care on fall risk continues to be fragmented and clinicians across disciplines wrestle with this issue. Not surprisingly, since the problems concerning falls have a multifactorial etiology, and fall prevention strategies need to therefore be multifactorial in their approach. Hence, coordination of fall-risk management (assessment and interventions) is of the essence (Capezuti, 2004). Bourbonniere & Evans (2002) recommend that a combination of educating staff and advanced nursing consultations are beneficial to exemplify care based on best practices to staff working with frail older adults. During phase two and three of the PAR-project, the pre-existing lack of communication between disciplines became an obstacle to the dissemination of information. Additionally, the presence of the different team structures formed a barrier to effective communication. A result was that some residents (e.g. Mrs. O.) did not receive the most optimal type of treatment as information on risk factors was missing.

Write, Goldman and Beresin (2007), describe the three essentials for successful fall management, as being: communication, policies and procedures, and teamwork. They found that staff members at the forefront of ensuring post-fall interventions – in a nursing home this would be the nursing assistants – that these team members were most likely to lack information on fall history and of the changes in care plans. Wright et al., (2007) therefore recommend that for a successful fall management program to be implemented, the organization needs to first know how the information will be communicated so that barriers are overcome. They describe the type of communication issues that may influence the process, as being: staffing patterns; frequency in staff rotation of daily care assignments; and alerting ancillary care team members of care plan changes.

The NP only became aware of the lack of communication while working on implementing the fall prevention project. In her project planning she had not specifically thought out the process of how to communicate the information. However, several elements helped her to improve the communication gaps. Along the course of the project the NP was able to build bridges across these gaps by interacting with the different disciplines on a regular basis through email, meetings, and short discussions. Seeing these different lines of communication as a web, the nurse practitioner is like a spider in its web. However, the breadth of the lack of team collaboration and communication was too extensive to solve by means of this fall prevention research project. As seen by the case of Mrs. O., where an underlying deficit in teamwork is at the root of the problem, we recommend that a project solely aimed at improving team collaboration and communication be initiated and run by the NP.

Behavioral disturbances and restraints:

A topic which continued to be at the center of our decision making process was that of behavioral disturbances. Behavioral disturbances contribute to an increased fall risk in the PG patient
population (Härlein et al, 2009). Disturbances in behavior, such as: agitation, vocalization, aggressiveness, and wandering, are commonly seen in the care for elderly with cognitive impairments (Voyer & Martin, 2003). We found that possible (acute) episodes of delirium, which are characterized by sudden behavioral disturbances, also pose a latent risk to increased fall incidents. These behavioral changes may result in use of restraints and narcolectics; isolation of the resident; falls; and burnouts among health care professionals (Voyer et al., 2003). Voyer et al. (2003), identified that non-pharmacological nursing interventions, either as alternatives to psychotropic drugs or as adjunct therapies, are not yet adapted enough in mental health nursing.

During our research project we found that there is a prevalent lack of understanding on the effectiveness of (pharmaceutical) restraint use and this formed a barrier to decrease the use of restraints or adjust medications. Behavioral disturbances are, together with fall-risk, a risk factor to use of restraints (Van Norden, Verhoeven & Schots, 2010). The prevalence of use of restraints in Dutch nursing homes, according to Hamers & Huizing (2005), is between 41% en 61%. In our research project, the misconceptions were found in both care staff and family members. They believed that fixating the resident in a chair or bed, or with the use of psychotropic drugs, is the most effective way to prevent falls. This stood in the way of the fall prevention team reducing restraint use during the PAR-project.

In phase three we described how the NP worked on overcoming the barrier of misconceptions on the negative side-effects of restraint use, by writing an education program for family members of PG residents. At the same time, we hypothesize that the new Law will form a potential facilitating factor to introducing non-fixation policy, as this will be required by law in 2013. Continued education and information will be needed to overcome these misconceptions. Tailing the PAR and Blijf Staan projects, a project on reducing restraint use will be designed and implemented at this nursing home by the SGM. We recommend that the NP, as advisor, focuses her educational efforts on reducing misconceptions in the care staff and family, while promoting the use of non-restraint fall prevention measures in her practice as co-health provider and in that of other disciplines.

Besides the (medical) restraint use side-effects to increased fall risk, behavioral disturbances pose a latent risk factor to falling and should be part of the risk assessment. However, the existing risk screening tool that Careyn uses, does not include behavioral disturbances (besides mental health problems, though this implies cognitive impairments). We therefore recommend that delirium is made part of the risk factors during assessment and that the DOS is used when uncertain of the reason for the change in behavior, in addition to the UTI screening already present at this facility. As with all prevention efforts, the first step to early detection and efficient management of delirium is through increasing knowledge and awareness on the topic (Ski & O’Connell, 2006).

**Population-based care versus generalized care:**

The Careyn fall-risk management approach currently is meant to target all Careyn clients (in-patient and out-patient clients). We must ask if the diverse set of individuals and patient populations will have access to the appropriate and needed care services (Chassin & Calvin, 1998). The CBO (2004) fall prevention guideline differentiates between community dwelling elderly; nursing home and assisted living facility residents; and hospitalized elderly populations. For each of these subpopulations the specific risk-factors, and interventions targeting the risk-factors are described and compared with existing evidence. Even though in all three of these areas the elderly client is at increased risk of falling (CBO, 2004), the intrinsic and extrinsic risk factors cannot be generalized. This is not mentioned in specific terms by the research group that developed the CBO guideline, but is implied by the fact that they delineated between these three settings. The generalized approach to fall-risk management in the current Careyn care service posed a barrier to implementing interventions that aimed at providing appropriate care for the PG population. Furthermore, the Careyn assessment tools are not reliable and therefore posed a barrier to risk identification in the PG population. Ongoing education is recommended.
5.2 Facilitating factors to implementation

Awareness of the problem:

It is possible to say that the fall prevention projects (PAR and Blijf Staan) would not have been initiated if the insurance company had not required all care organizations to use a portion of the insurance coverage for quality care improvement projects. At the same time, the topic of fall prevention was chosen by Careyn, because it had identified the increased fall-incident levels previously. Registration and evaluation of fall incidents was already in place at the Careyn facilities in terms of fall incident (MIC) reports. This increased awareness of the problem. Financial and problem-driven incentives to change to better quality care were major facilitating factors to our implementation project.

In order to implement general measures to fall prevention, ensuring correct registration of fall incidents (in the charting and in terms of incident reports) is one of the recommendations made by the CBO (Neyens et al., 2005). Because all residents are at some level of risk of falling within the nursing home setting (CBO, 2004), general measures to safety and awareness help to reduce fall risk for all residents. These general measures to increased awareness are realized by: continuously alerting to the problem through schooling or instructions; structural attention to the topic in the daily care process (for example by discussing the topic during staff meetings); adequate staffing to offer sufficient supervision; safe dependent transfer techniques; correct use of aids; clarifying procedures in case of a fall event; and ensuring correct registration of fall incidents while basing the policies and procedures on the registration evaluations (Neyens et al., 2005).

In our attempt to implement the fall prevention interventions, we focused on general measures through schooling staff members, educating family, and by means of disseminating information on the project to the different disciplinary departments. For this last subject we faced obstacles, as the NP had not determined in what manner the information would be communicated. This is why we recommend that, at the start of the project, the information dissemination process should be designed by the project coordinator. In our case, for example, we could have said that the NP writes up a short monthly summary that is emailed to all departments.

Advance practice nursing:

As reflected upon in chapter 3, being an active care team member, and a co-health provider, the NP connected with paramedical, medical and care staff colleagues on a daily basis. The different teams were somewhat linked during the PAR-project as the NP started communicating with and through these different structures. Still, information easily got lost between the teams. In order to communicate effectively within an organization as large and varied as a nursing home, it is important for the multidisciplinary team meetings to be frequent enough and attended well enough. We recommend that all disciplines are present at all multidisciplinary meetings. We also recommend that the psychologist is made part of the team as she is otherwise not involved enough in the decision making process. In her ability to assess potential behavioral problems, the psychologist is an asset to the medical and paramedical teams in raising awareness on existing and potential problems. As far as the communication between teams on a weekly basis, it is important for the FRNA to be present during the doctor’s round as often as possible and for her to read the electronic patient records on a regular basis.

Not all interventions needed to be multidisciplinary: Some interventions, however multifactorial, such as blood pressure control and medication screening, were not considered multidisciplinary. These interventions could be initiated and evaluated by a single discipline such as the NP. According to the CBO guideline (2004), the goal should be to treat all residents at risk of falling with a multidisciplinary approach. This is a point of discussion, as research has not shown the need for the approach to be multidisciplinary for all residents and this project has shown that one discipline (the NP) could provide a multifactorial fall prevention strategy. At the same time, the
identification of fall risk is up to the clinical judgment of the different health care professionals, as current assessment tools do not face up to the challenging problems of fall risk in the dementia population (Neyens et al., 2006).

In our research we found that a lack of communication between disciplines resulted in one resident not having the right risk factors assessed and treated. A multidisciplinary risk assessment would have been necessary for this individual in order to come up with a complete assessment of the risk factors. This is the main reason why we recommend that a multidisciplinary approach specifically to fall risk assessment is used in order to prevent omitting important information and basing a multifactorial intervention on the wrong risk factors. Multidisciplinary risk assessment ensures a multifactorial approach, as each discipline has its own area of expertise.

5.3 Strengths and weaknesses of the project

Project design:

A strength of the research project was its project design. Using a participatory action research design to implementing a multidisciplinary guideline to fall-risk management was very effective as this research model is solely based on multidisciplinary action and collaboration. Asking the involved disciplines to reflect on their own actions was the key to success. This meant that the participants had a level of self-directed action and self-directed learning that propelled the project. For the NP, as project coordinator, to also be an active participant and active member of the multidisciplinary team, this facilitated the implementation process as she connected with the participants from the ground up.

Validity:

A weakness of the project was its validity. We were not able to measure the effectiveness of the intervention. The researchers could not say that the outcome of a decreased fall-rate was related to the implemented strategies. We did see a decrease in falls over the course of the project, but comparing this with the fall-rate in 2010, we saw months with very high fall-rates and months with very low fall-rates. The research period of six months was not long enough to analyze the effects of our fall-risk management approach towards fall-rate as we would need at least 12 months of measuring fall-rate in order to compare these with the previous year. We did not have a control group and we did not do pre- and post tests – all threats to the internal validity. Our measurements were focused on what was done, how it was done and by whom, and what were the barriers and facilitating factors (process analysis). We measured several different outcomes (e.g. fall-rate, type of risk factors assessed, type of interventions, type of medication adjustments and so on) and this makes it hard to come to conclusions on the outcomes.

In terms of what was done, how it was done and by whom, we did see a difference in approach to fall-risk management from the previous approach. These differences were:

- All residents of the PG wards were being assessed for fall-risk not just with the Careyn screening tools, but by assessing intrinsic risk-factors that were based on the body of evidence. These assessments were not just done by the nursing assistants, but were done by nursing assistants, NPs, and the OT and PT department.
- A multidisciplinary consultant team analyzed the assessments and gave recommendations on the care planning that was aimed at the PG population and based on existing evidence as well as best practice approaches.
- Extrinsic risk factors were assessed. The environment of both wards was checked by using the Blijf Staan environmental check list and the findings were passed on to management.
- Residents with a recent fall event were now being assessed on precipitating factors and a care plan was designed aiming at multiple risk factors. This was different from before, as previously the resident would only be checked for injury which is a form of acute care that is not suitable to the chronic care needs of nursing home residents.
• Care planning was now based on evidence based guidelines and could be evaluated not on effectiveness (see validity), but more so on quality. The guideline states that a sufficient approach to fall-risk management is that of a multidisciplinary, multifactorial, approach (CBO, 2004). Evaluating if the steps taken to fall-risk management involved multiple disciplines and targeted multiple risk factors meant that we had a standard of care with which we could determine the quality of our care giving.

• How these changes will continue to be implemented was a question the NP and Blijf Staan project manager grappled with. They’re answer was to designed a flow sheet combining all approaches, but this tool needs to still be implemented and evaluated.

• The bi-weekly electronic fall-rounds done by the NP for all PG residents is something which supports the need for better attention to fall risk in the PG population.
Chapter 6. Recommendations

Lack of time:

We recommend that adequate staffing becomes a priority on the list of management as quality of care suffers directly when a staffing deficit is present. Because of limited time allocation, PT and OT need to be able to prioritize care needs and collaborate on care planning in order to use their allocated time most effectively. The PT stated that fall-risk should be the most important indication for PT treatment in the PG population and should therefore potentially get precedence over other less common care needs (such rehabilitation). This is an example of how a discipline uses his or her clinical judgment in prioritizing care. The next step is to research the body of evidence and test the acuity of our clinical judgment. Alternatives to the work processes, in order to prevent wasting time unnecessarily, is something the different departments need to investigate further. Can the time spent on assessment and observation be reduced while the time for treatment is increased?

Schooling:

We recommend that the NP focuses her educational efforts on promoting the use of non-restraint fall prevention measures, enhancing need-driven care and psychosocial interventions for behavioral disturbances, and offer teachings on strategies to improve use of aids and assistive devices in residents with cognitive impairments. Through schooling, the NP can reduce misconceptions of the care staff and family, while improving psychosocial care as is recommended (CBO, 2005). The NP could continue to educate the care staff and raise awareness on these areas, possibly enabling the care team to reduce the use of psychopharmaca. Ongoing education on fall-risk factors in the PG population remains crucial. The Careyn fall-risk screening tools do not include all important risk factors. The care teams should therefore be familiar with the CBO guideline.

Improving care:

We recommend that delirium is made part of the risk factor assessment and that the Delirium Observation Scale, in addition to UTI screening, is used when uncertain of the reason for acute changes in behavior. Behavioral disturbance are part of the fall-risk factors, as outlined by the CBO guideline. However screening for delirium is not mentioned by the CBO. This topic could be part of a future research project on fall-prevention in the PG population. We recommend that a multidisciplinary approach to specifically fall risk assessment is further improved in order to prevent omitting important information and basing the interventions on the wrong risk factors (as was seen in the case of Mrs. O.). A better control mechanism, to evaluate if requests and referrals are followed up on, is important in order to work collaboratively on care planning. As was seen in the case of Mrs. O., the physician failed to follow up on a request made by the psychologist (to investigate the episodes of hallucinations). At the same time, the psychologist failed to evaluate if something was done with her request. Last, changing the environment of the two reasonably large closed PG wards into that which resembles small scale residential facilities, could mean that there is a calmer environment, and more time and attention for the individual (Zadelhoff, Abma, Verbeek & Widdershoven, 2010).

At small scale residential facilities, the care is tailored to the unique needs of the individual and this is made possible because there are a limited number of residents present (Zadelhoff et al., 2010). However, according to Hazelhof (2008), small scale residential facilities do not necessarily lead to a reduction of behavioral disturbances or use of psychopharmaca. According to research, 80% of people with dementia will display some form of problem behavior (Hazelhof, 2008), and at small scale living facilities these behavioral disturbances are seen equally. Continuing to place attention on psychosocial interventions and improving need-driven care is key when working with people with cognitive impairments.
Future (research) projects:

We recommend that projects are started by setting measurable goals and that there is space and time for presenting the outcomes to colleagues. We recommend that the following projects are run at nursing home de Plantage:

- A project solely aimed at improving team collaboration and communication.
- The subjects of hearing and vision impairments in the PG population should also be investigated further. The medical complications related to earwax blockage are researched and according to some the complications include diminished hearing and vertigo (Subha & Raman, 2006). We recommend that half-yearly cerumen-impaction screenings are done in order to rule out hearing loss from impaction. In terms of screening vison impairments in residents with cognitive impairments, we were not able to find a solution to this problem over the course of this project, and we therefore recommend that a NP or physician investigate this issue further.
- Delirium screening, as an intervention targeting fall-risk related to behavioral disturbances should be part of a future research project on fall-prevention in the PG population.
- A future project run by the PT department investigating the currently limited resources on, and knowledge of alternatives to restraint use, and researching evidence on which care needs should be prioritized in the PG population should generate enhanced, quality care.
- For this project, we were not able to investigate to what extend our interventions had let to a decrease in restraint use. A future research project on restraint reduction should be conducted at this facility.

We recommend that innovative projects are coordinated by the NP, as the multitasking NP is trained in different roles, each very important to the implementation and evaluation of innovative projects. While the NP is an active member of the care team, to then coordinate projects, the process is facilitated by the NP working from the ground up. Even though this project was a collaborative effort, to have one discipline evaluate the problem, review the literature, coordinate the program and participate in it as co-health provider meant that the aspects of evidence-based and best practice knowledge were integrated at the heart of the endeavor. When asked what managers could do to ensure that the NP reserves time for quality care improvement projects, the main requirement that motivates the NP in doing so is by truly feeling responsible for the quality of care.
Summary

Introduction: In addition to an increased fall risk for nursing home residents, fall incidents are greater in psychogeriatric nursing homes. Dutch nursing homes do not, as of yet, have specific guidelines or structured fall prevention programs for the cognitively impaired patient population and little research exists on fall-risk management in this patient population.

Methods: Using a Participatory Action Research model the researchers implemented the Institute for Quality Health Care (CBO) guidelines for nursing home fall-risk management and (existing and self-made) assessment tools for risk assessment at two psychogeriatric wards of nursing home de Plantage. A multidisciplinary consultant fall prevention team and assessment team were formed. A collaborative approach to multifactorial fall-risk management was implemented and the qualitative data were analyzed using the methods of process and content analysis.

Results: In a six-month time frame there were four assessment periods and four intervention implementation rounds. There were four meetings of the consultant fall prevention team. Fifty nine residents were assessed on fall risk factors. Residents that were ambulatory or could make transfers independently were considered to be “at risk” of falling. Twenty three residents were treated using a multidisciplinary, multifactorial approach because they were considered to be “at risk”. Interventions targeting evidence based fall risk factors including nursing, medical, paramedical and psychological interventions. A tools evaluation pointed out that the self-made tools are not reliable and could not be used as risk identifiers. Electronic fall-rounds by the NP ensured continuity of care.

Conclusion: Despite the successful results of this study, assuming correlation between the interventions and the outcomes in terms of fall-rate reduction could not be measured. There was a fall-rate reduction, but this was not different from fluctuating fall-rates in the previous year. There was no barrier to implementing a multidisciplinary, multifactorial fall-risk management approach at the PG wards despite barriers such as: limited time, staffing shortage, added workload, and ill communication. What facilitated the process was the involvement of the NP on different levels, the action research project design, financial and problem-driven incentives, and the raised awareness through staff training and family education.
Samenvatting (Nederlandse versie)

**Introductie:** Samen met het verhoogd valrisico in verpleeghuizen, zijn val incidenten hoger in psychogeriatrische verpleeghuizen. Nederlandse verpleeghuizen hebben tot nog toe geen specifieke richtlijnen of gestructureerde valpreventie programma's voor bewoners met een cognitieve stoornis en er bestaat weinig onderzoek naar valpreventie programma's in deze patiënten populatie.

**Methode:** Doormiddel van het actie onderzoek model implementeerden de onderzoekers de richtlijn valpreventie van het Kwaliteitsinstituut voor de Gezondheidszorg (CBO) voor verpleeghuis bewoners en (bestaande en zelfgemaakte) assessment instrumenten voor risico assessment op twee PG afdelingen van verpleeghuis de Plantage. Een multidisciplinair val preventie advies team en een assessment team werden gevormd. In samenwerkingsverband werd een multifactoriale valpreventie aanpak geïmplementeerd en werd de kwalitatieve data geanalyseerd met behulp van inhoud en proces analyses.

**Resultaten:** Gedurende zes maanden waren er vier assessment periodes and vier interventie implementatie rondes. Er waren uiteindelijk vier vergaderingen met het advies team. Negenvijftig bewoners werden gescreend op valrisico factoren. De bewoners die konden lopen of zelfstandig transfers konden maken werden gezien als “valgevaarlijk”. Drieëntwintig bewoners werden behandeld doormiddel van een multidisciplinaire, multifactoriale aanpak omdat zij gezien werden als valgevaarlijk. De interventies die gericht waren op evidence based valrisico factoren waren: verpleegkundige, medische, paramedische en psychosociale interventies. Uit de evaluatie van de instrumenten kwam naar voren dat de zelfgemaakte instrumenten niet gebruikt kunnen worden voor risico identificatie. Elektronische valronden door de NP garanderen continuïteit van zorg.

**Conclusie:** Ondanks de succesvolle uitkomsten van het implementatieproject, kon er geen link worden gelegd tussen de interventies en de uitkomsten als het ging om vermindering van valincidenten. Er was een vermindering in valincidenten, maar hierin was geen verschil herkend met de fluctuerende valincidenten uit het voorgaande jaar. Er waren geen barrières voor het implementeren van een multidisciplinaire, multifactoriale valpreventie aanpak, ondanks barrières als: tijdslimiet, tekort aan personeel, verhoogde werkdruk, en gebrekkige communicatie. Wat het proces faciliteerde was de betrokkenheid van de NP op verschillende niveaus, het actie onderzoek project ontwerp, financiële en probleemgerelateerde motivatie, en bewustwording door scholing en voorlichting.
Epilogue

This master’s thesis report was the final assignment of the Masters in Advanced Nursing Practice program. The research project was designed to improve care concerning fall-risk management in the psychogeriatric patient population. We focused on implementing multidisciplinary, multifactorial approaches and analyzed the process in doing so. The project design was modeled after the participatory action research approach and involved a collaborative effort to quality care improvement. So much can be learning from collaborating on improving care. Being enabled to find our own way in the maze of care protocols and webs of communications, propelled by our own insights, was perhaps the most precious experience in coordinating this project.

I would like to thank Jeroen Merkx, medical team manager at Careyn, for encouraging me to do research on the topic of fall prevention and for guiding me in finding my way in the creative process of doing research. I would like to thank Lillian Maas en Jacomine de Lange for guiding me in the process of doing research and writing this paper. I would like to thank Liesbeth Ridder for her support and all other colleagues at nursing home de Plantage for their involvement in the project. I would like to especially thank Dr. Huub van Alem and Tanja Ista for sharing their expertise on fall-risk management, and for joining me in the consultant team, and thank Sandy de Bruyn and Vivian Boer for their input while being part of the assessment team. I would like to thank Ellen Hoogsteden for her input and for the laughs. I would like to thank my sister (Masja) and mother (Addie) for being there while I was re-immigrating back to the Netherlands. I would like to thank all the ever cheerful children in my life (Hadassa, Maroesja, Joel, Leon and Noa). Last, I would like to thank my partner, Lukas, for supporting me throughout these two years and for his wholehearted, insightful, loving presence in my life.

... 

Let this report be evidence to show that evidence based guidelines on fall-risk management programs are actually routinely incorporated in care plans at elderly care facilities

...
References:


Voyer, Ph. & Martin, L.S. (2003). Improving geriatric mental health nursing care: making a
case for going beyond psychotropic medications. *International Journal of Mental Health Nursing;* 12, 11 - 21.


LET OP!!!: Appendix A hier invoegen en deze pagina weggooien!
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Appendix C. Electronic progress note example on how the recommendations were communicated to other team members

Subjectief: Valpreventie team gesprek. Aanwezig: Tanja (ergo), Huub (arts), Rianne (NP).

Objectief: Dhr valt de laatste tijd veelvuldig. De laatste 3 maanden viel dhr 11 keer. Dhr loopt en staat zelfstandig. Screeningslijst valrisico score 95 (hoge risico). Dhr is brildragend, maar draagt zijn bril nooit, heeft zwerfgedrag en voorgeschiedenis van nachtelijke onrust. Laatste RR 90/50 P64. Heeft >4 soorten risico medicijnen. Dhr is makkelijk in de omgang en krijgt graag aandacht.

Evaluatie: Valgevaar n.a.v. meerdere valrisicofactoren: dementie, loopdrang, cardiovasculaire aandoening (nu hypotensie), polypharmacy en meerdere risico medicijnen.

Plan: In overleg met Huub en Tanja: Bij artsen visite zal NP advies voor medicatie wijzigingen bespreken. De visus is moeilijk te evalueren bij
Appendix D. PowerPoint slides that were used in the schooling session offered to PG care staff of both wards

Valpreventie in de PG

Rianne Kooiman, NP Io & Tanja Ista, Ergotherapeut
21 maart 2011

Doelgroep en Onderwerp

- Verzorging van de PG afdelingen van de Plantage
- Valpreventie voor dementerenden en Actie Onderzoek
Valpreventie

- Stap 1 = kijken naar de risicofactoren
  - Een multidisciplinaire aanpak (lijst invullen)

- Stap 2 = kijken naar de behandel-mogelijkheden
  - Een multifactoriale aanpak (disciplines inschakelen)

- Stap 3 = kijken naar de uitkomsten
  - Blijven evalueren (o.a. in MDO)

Multidisciplinaire aanpak

- Verzorging
- Ergotherapeut
- Nurse practitioner/arts
- Psycholoog
- Fysiotherapeut
Stap 1

- Kijken naar de risicofactoren:

<table>
<thead>
<tr>
<th>Val risicofactoren in verpleeg/verzorgingshuis (CBO, 2004)</th>
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<tbody>
<tr>
<td>Eerder gevallen</td>
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<tr>
<td>Mobiliteit en balansproblemen</td>
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<tr>
<td>Afhankelijkheid in ADL activiteiten/verplaatsingen</td>
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<tr>
<td>Leeftijd</td>
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<tr>
<td>Omgevingsfactoren</td>
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<tr>
<td>Orthostatische hypotensie</td>
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<tr>
<td>Psychofarmaca/ hartmedicatie</td>
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<tr>
<td>Dementie en cognitie</td>
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<tr>
<td>Gedragsproblemen</td>
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<tr>
<td>Visusstoornis</td>
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<td>Angst om te vallen</td>
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</tbody>
</table>

Stap 1, wie doet wat?

- Verzorging
  1. Eerder gevallen?
     Goede MIC-rapportage, melding val aan NP
  1. Afhankelijk in ADL activiteiten?
     (Zoekt iemand steun, risico op uitglijden, pijn, vermoeidheid, e.d.)
  1. Onafhankelijk bij verplaatsingen?
     (draaien, zelfstandig opstaan, loopdwang)
  1. Medicatie kritisch bekeken?
Stap 1, wie doet wat?

- Ergotherapeut
  1. Mobiliteit en balans problemen?
  2. Afhankelijk in ADL activiteiten? (cognitieve vaardigheden, visus, pijn, vermoeidheid)
  3. Onafhankelijk bij verplaatsingen?
  4. Omgevingsfactoren (voorzieningen, hulpmiddelen)
  5. Visus

- Nurse practitioner ism arts
  1. Eerder gevallen?
  2. Onafhankelijk bij verplaatsingen?
  3. Orthostatische hypotensie?
  4. Psychofarmaca?
  5. Gedragsproblemen?
  6. Hartmedicatie?
Stap 1, wie doet wat?

- Psycholoog ism arts/NP
  1. Dementie en cognitie status?
  2. Gedragsproblemen?
  3. Psychofarmaca?

Stap 2

- Kijken naar de behandel-mogelijkheden:

<table>
<thead>
<tr>
<th>Preventie maatregelen in verpleeg/verzorgingshuis (CBO, 2004)</th>
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<tr>
<td><strong>Algemene maatregelen:</strong></td>
</tr>
<tr>
<td>Veiligheidsbeleid (bouwtechnisch)</td>
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<tr>
<td>Bewustwording (scholing, voorlichting)</td>
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<tr>
<td><strong>Specifieke maatregelen:</strong></td>
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<tr>
<td>Kritische evaluatie van medicatie</td>
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<tr>
<td>(Individuele) oefenprogramma’s</td>
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<tr>
<td>Bedalarm</td>
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<tr>
<td>Aanpassing van omgevingsfactoren</td>
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<td>Aandacht voor visusstoorrissen</td>
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<tr>
<td>Verbetering van schoeisel</td>
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<tr>
<td>Goed onderhoud en verantwoord voorschijven van hulpmiddelen</td>
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<tr>
<td>Behandeling van orthostatische hypotensie</td>
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<tr>
<td>Een multifactoriale aanpak</td>
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</table>
Multifactoriale aanpak

- Algemene én specifieke maatregelen
  (Enkele voorbeelden: pedicure bij pijnlijke ingegroeide nagel, krachttraining, antislipmatje, belsensor, trippelstoel, langzaam overeind komen, rustmomenten bieden, safehips, medicatie aanpassen, bril, etc.)

- Meerdere specifieke maatregelen tegelijk
  (op basis van een individuele risico evaluatie)

Stap 2, wie doet wat?

- Verzorging
  1. Veiligheidsbeleid: omgevingscheck
  2. Bewustwording: geven van voorlichting
  3. Aanpassing omgeving/ begeleiding (tempo, gerust stellen, structuur)
  4. Bedalarm
  5. Aandacht voor visus
  6. Verbetering schoeisel
  7. Onderhoud hulpmiddelen
  8. Activiteiten begeleiding
**Stap 2, wie doet wat?**

- **Ergotherapeut**
  1. Veiligheid: omgevingscheck (vb. mogelijkheid tot steun nemen, energieverdeling, stoel in gang, deugdelijk materiaal, antislipmat)
  2. Bewustwording: scholing
  3. Bedalarm (bereik, waar?, welk?)
  4. Aandacht voor visus (verlichting, voor ADL bril op)
  5. ("Onderhoud" en) verantwoord voorschrijven van hulpmiddelen (safehip, (bed)beugels)
  6. Advies ADL/ aanbieden activiteiten (omgaan met pijn, gedrag, creatief aanbieden bewegingsactiviteiten)

- **NP/arts**
  1. Bewustwording: scholing en voorlichting
  2. Kritische evaluatie van medicatie
  3. Aandacht voor gedragsproblemen
  4. Aandacht voor visus
  5. Behandelen orthostatische hypotensie
Stap 2, wie doet wat?

- Psycholoog/arts/NP
  1. Aandacht voor gedragsproblemen (ABC's)  
     (oorzaak onrust? , hoe rust brengen)
  2. Intervisie

- Fysiotherapeut
  1. (Individuele) oefenprogramma's
  2. Onderhoud en verantwoord voorschrijven van hulpmiddelen
Stap 3

- Blijven evalueren

**Evaluatie criteria**

<table>
<thead>
<tr>
<th>Kriterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meerdere disciplines hebben ernaar gekeken?</td>
</tr>
<tr>
<td>Meerdere behandelingen zijn gestart?</td>
</tr>
<tr>
<td>Hoe vaak valt de bewoner nu ivm voorheen?</td>
</tr>
<tr>
<td>Zijn de MIC cijfers veranderd?</td>
</tr>
</tbody>
</table>

**Blik op de risicofactoren**

**Casus**

**Wat doet u?**

- Vul de risicoanalyse in.
  - Heeft ze geen, laag of hoog risico?
  - Heb je nog aanvullende informatie nodig? En zo ja van wie?
- Wat ga je doen?
Zorgprocess

<table>
<thead>
<tr>
<th>Preventie</th>
<th>Interventie</th>
<th>Evaluatie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fysio/Ergo: Observatie mobiliteit en balans (Tinetti), training in transfers, inzetten hulpmiddelen, advies beweging, oefen programma.</td>
<td></td>
<td>Psycholoog: voortgang evalueren tijdens twee-wekelijkse intervisie, aanwezig tijdens ZLP overleg.</td>
</tr>
<tr>
<td>Activiteiten Begeleiding: Beweeg groepjes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appendix E. Flowsheet (-draft version), designed by NP (Rianne Kooiman) and Blijf Staan project manager (Ellen Hoogsteden), May, 2011**
## Organisatie

### Preventie
- **Management - organisatie niveau:** Vraagt subsidie aan en zet het onderwerp op de kaart.
- **Management - locatie niveau:** Neemt aandachtspunten van zorg team manager (ZTM) mee in de planning.
- **Management - afdeling niveau:** Zit in MIC commissie, stelt ad hoc valpreventie teams samen voor jaarlijkse uitvoering van actie plannen, sponsord scholing, draagt zorg dat EVVers de formulieren correct gebruiken en neemt aandachtspunten -- gesignaleerd uit Blijf Staan module -- mee naar team overleg met locatie manager.
- **MIC commissie (en ad hoc valpreventie teams):** Blijf Staan module actieplan jaarlijks uitvoeren.
- **Clientenraad:** (Optioneel) assisteert bij uitvoering van actieplan.
- **Scholingsbureau:** Jaarlijkse scholing en voorlichting (voor personeel en familie).

### Interventie
- **Management - afdeling niveau:** Neemt aandachtspunten -- gesignaleerd uit MIC evaluatie -- mee naar team overleg met locatie manager.
- **MIC commissie (en ad hoc valpreventie teams):** Initieren van actieplan specifiek mbt MIC evaluatie uitkomsten.

### Evaluatie
- **Management - alle niveaus:** evalueren uitkomsten MIC evaluaties.
- **MIC commissie (en ad hoc valpreventie teams):** MIC en EZD evaluatie ieder kwartaal.
- **EZD werkgroep:** Implementeren electronische versie van risico analyse en screeningsformulieren.