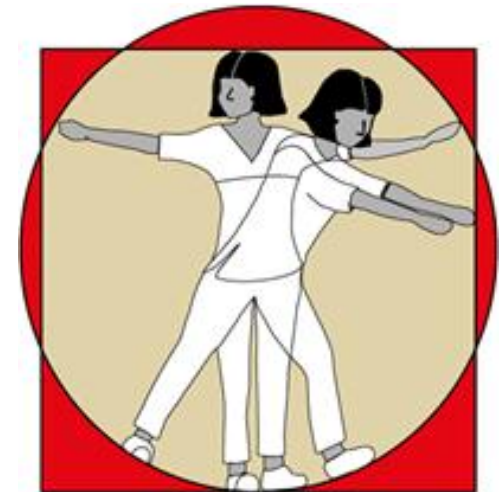


# **Physical Risk Assessment for Health and Aged Care**

**ErgocareBank conference**

**Lassi, Kefalonia Greece**

**17.09.2015**



**ErgocareBank**

**Leena Tamminen-Peter, Ph.D. TPT**  
**Ergosolutions BC Oy Ab**

**Turku, Finland**  
email: [leena@ergosolutions.fi](mailto:leena@ergosolutions.fi)

# Content of the presentation

- **Why and how to find risks?**
- **Risk assessment methods**
- ISO/TR 12296:2012
  - a technical report on safe patient handling
- **Main results of risk assessments in the ErgocareBank -project**
  - in Oulainen Home Care
  - in Tarto Nursing Home
- **Introduction how to plan safe handling policy**

# Why and how to find risks?

Healthcare staff are subject to some of the greatest risk of musculoskeletal disorders (MSD), causing both human and economic costs:

- Long term injuries
  - Absence from work
  - Staff turnover
  - Increased costs to healthcare providers
  - Litigation and insurance claims
- 
- A hazard is present when patients are manually handled.

# What is the ISO TR 12296 about ?

The ISO TR gives an overview of evidence based methods to assess problems and risks associated with manual patient handling, and details how to identify and apply **strategies** and **solutions** to reduce these risks. It reviews hazard identification and **risk assessment**, not just in relation to health risks, but also in identifying and solving problems.

## Content of the ISO TR

- Risk estimation and evaluation
- Organizational aspects
- Aids & equipment
- Buildings & environment
- Staff education & training
- Evaluation of intervention effectiveness

## More info

- the full ISO Technical Report is available for purchase via the internet under <http://www.iso.org>.
- A scientific article by S. Hignett, Fray et al. **International consensus on manual handling of people in the healthcare sector: Technical report ISO/TR 12296** is in the International Journal of Industrial Ergonomics Volume 44, Issue 1
- ArjoHuntleigh has published **An edited Summary of the ISO Technical Report 12296**

[An easy-to-read edited summary is available for download here](#)

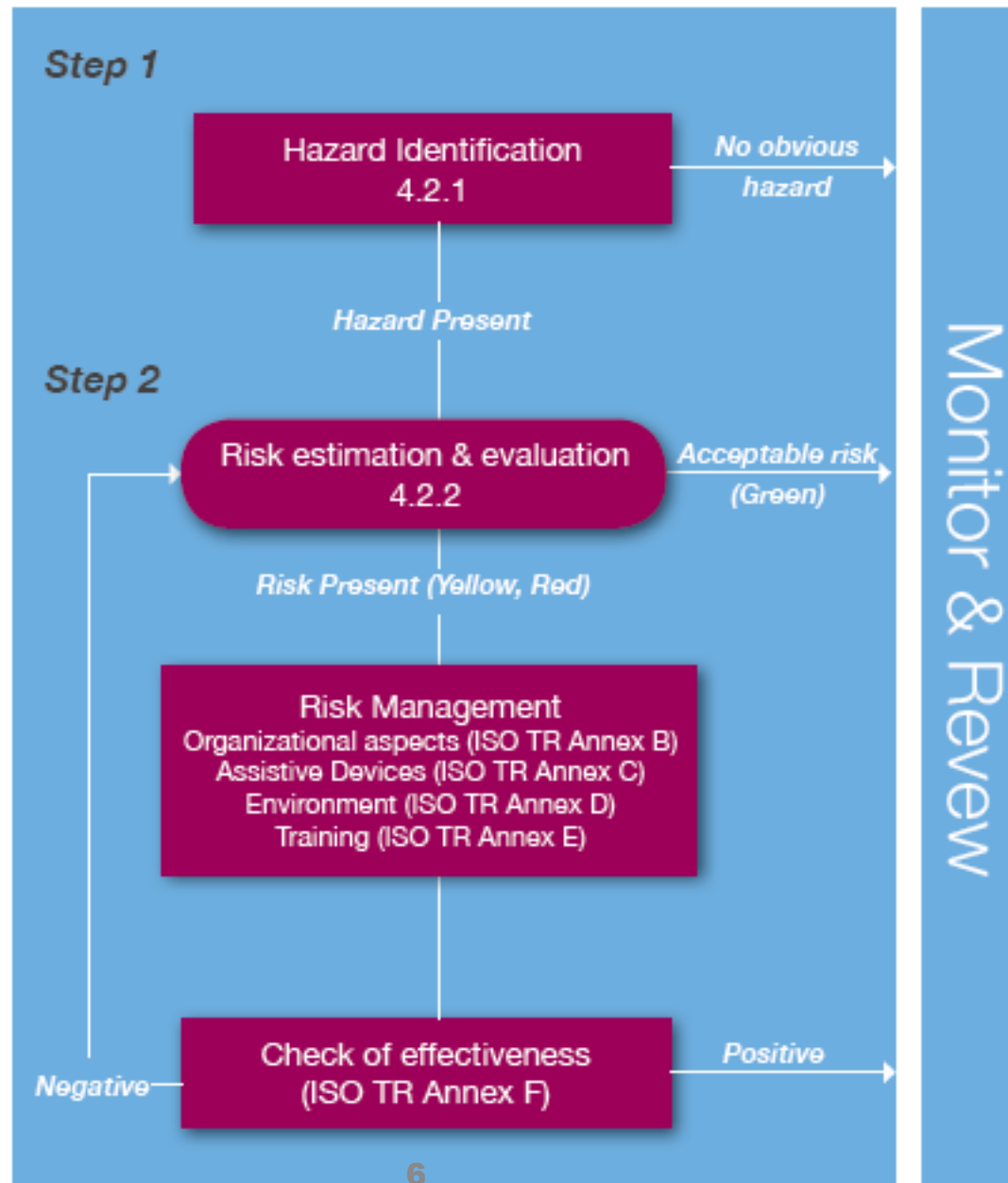


# Two major objectives of Technical Report and also ErgocareBank

1. To improve caregivers' working conditions by decreasing the risk of biomechanical overload, limiting work-related illness and injury, and the consequent absenteeism and costs;
2. To ensure patients' quality of care, safety, dignity and privacy while continuing to meet their needs, including personal care and hygiene.

**A systematic review of patient handling literature shows that strategy for risk assessment, application of engineering controls and management must be comprehensive (multifactor interventions) to be successful.**

# Risk assessment model



# Risk assessment should consider the presence of several factors and how they are related

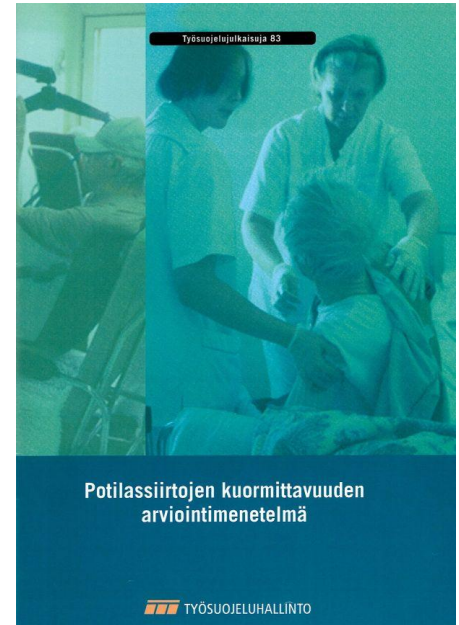
- Type of patient
- Induced “care load”
- Available caregiver staff
- Available and adequate equipment
- Building, environment and spaces
- Training and skill of nursing staff

There are a number of evidence based method for risk assessment in Patient Handling. The following 4 practical methods are Presented in the TR and they are applied to a common scenario

- Dortmund Approach
- MAPO-Index
- PTAI Patient (Patient Transfer Assessment Instrument)
- Care Thermometer

PTAI- method in internet:

[http://tyosuojelujulkaisut.wshop.fi/documents/2009/04/TSJ\\_83.pdf](http://tyosuojelujulkaisut.wshop.fi/documents/2009/04/TSJ_83.pdf)



Care   
Thermometer  
*A self assessment tool from ARJO*

**Risk Assessment**



**Risk Management**

Based on:

Organisational aspects

Buildings & environment

Adequate aids and equipment

Training & education

Check effectiveness



# The risk assessment methods used for Home Care and Nursing Home –Work

## ❖ Patient Transfer Assessment Instrument

**PTAI – method** (*Karhula et al. 2009*)

- ❖ [http://tyosuojelujulkaisut.wshop.fi/documents/2009/04/TSJ\\_83.pdf](http://tyosuojelujulkaisut.wshop.fi/documents/2009/04/TSJ_83.pdf)

## ❖ Dortmund Approach (*Dortmund Lumbar- Load Study 3 Jäger et al. 2008a, Theilmeyer et al. 2008*)

- ❖ Measurement of caregiver's action forces in 15 patient transferring situations. Method can be used for rapid evaluation of low-back loading.
- ❖ Available in ISO/TR 12296:2012

## ❖ Care Thermometer – classification only used

- [www.carethermometer.com](http://www.carethermometer.com)



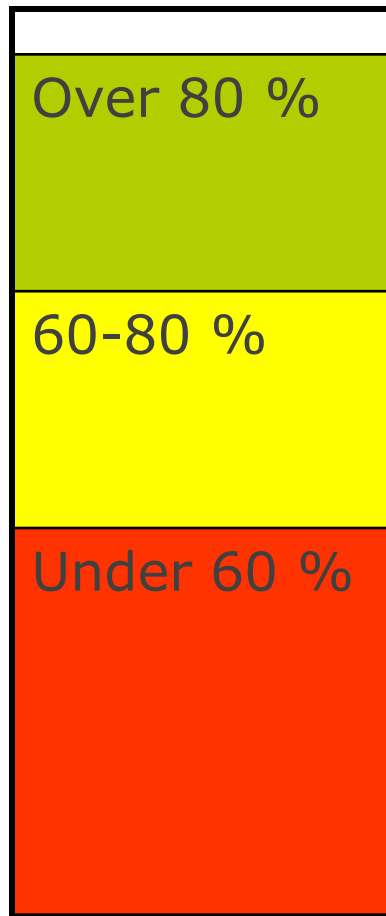
# Evaluation principles of

PTAI

- A total of 15 factors are observed or interviewed.
- Every factor has three criteria and they all must be in order before the "in order" column can be marked.
- If 1–2 of the criteria are in order, the "partially in order" column is marked according to whether 1 or 2 criteria are in order.
- If no criteria are met, the section being assessed is "not in order".

In order 3/3	Partially in order 2/3                      1/3		Not in order 0/3

# Interpreting the **PTAI** - index



## **Over 80 %**

- The situation in terms of patient transfer ergonomics is good in the evaluated transfers.
- The evaluator and/or occupational health care representative provide instructions on maintaining and further improving the situation.

## **60–80 %**

- The load of patient transfers is quite high, and measures to correct the problems identified in the evaluation form should be taken at the workplace.

## **Under 60 %**

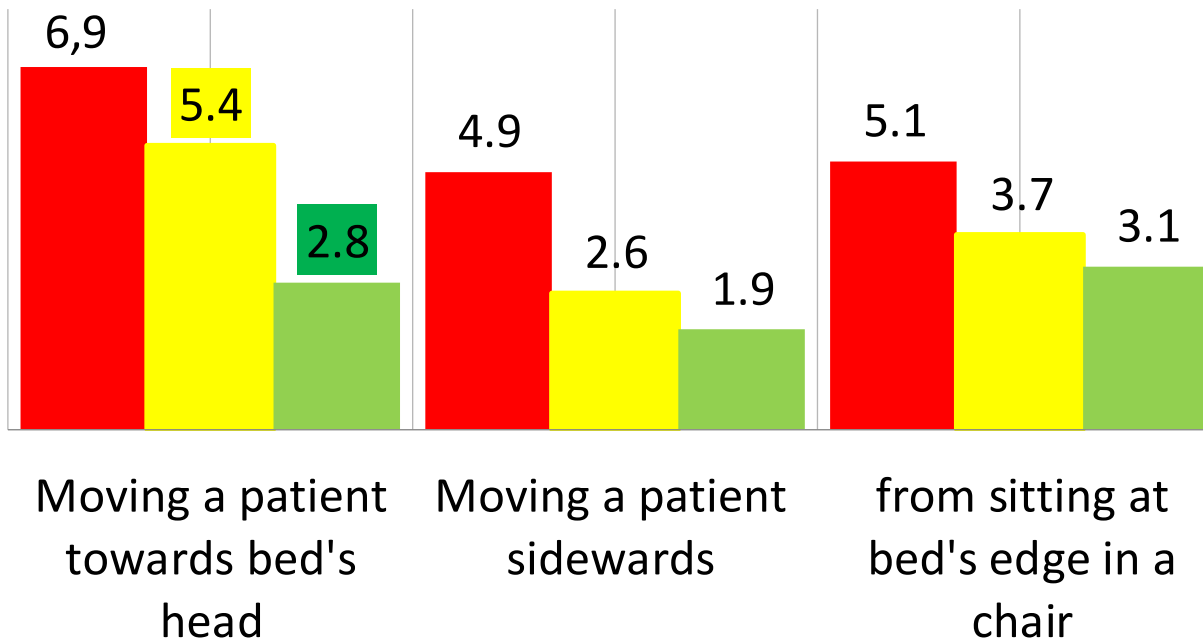
- The employer must take immediate measures to improve ergonomic working methods.
- The development measures should utilise the input of employees, occupational health care, the occupational safety and health organisation and possibly external experts.

# Dortmund Approach- method

## Lumbosacral load and limits for compressive forces

### Lumbosacral compressive force in kN

■ Conventional ■ optimized ■ optimized + small aids



Age	Female (kN)	Male (kN)
20–29	4,4	6,0
30–39	3,8	5,0
40–49	3,2	4,1
50–59	2,5	3,2
≥ 60	1,8	2,3

*Dortmund Lumbar Load Study  
Jäger & Luttman 1999*

# **The results of Interviews**

**What are physically the heaviest tasks in caregiver's work?**

- Moving the patient towards the bed's head.
- Lifting up a patient from the floor alone
- Transferring a patient from bed to bed or chair
- Raising a person with severe stroke incident from the bed
- Helping a patient to sit on the chair, bed
- Personal hygiene

# Results of Oulainen Home Care

## To be improved

- Lack of space
  - Low beds
  - Hygiene care in toilet
  - Dressing
  - Patient handling skill
    - Assisting a fallen client to get up from the floor
    - Assisting a client from lying to sitting at the edge of the bed
    - Raising a client from sitting to an upright- standing-position
    - Activating clients to move
- Harmful static and biomechanical work load of the back**
- Static work load for arms and shoulders**



<http://raizer.com/>

# Risk factors in home-care and nursing homes



- Risk factors for permanent work disability among home-care workers (Dellve et. al.2003)
  - Poor ergonomic lifting conditions
  - Time pressure
  - Lack of professional caring technique

## Repeated bending and back rotations

- Home care workers spend almost half of their working time in the client's homes in the bad posture (Pohjonen ym. 1995)
- In nursing homes nurses are
  - 1541 times bending  $> 20^\circ$  forwards
  - Working  $\sim 2$  hours per shift with a  $> 20^\circ$  bent back (Freitag 2014).





# Mrs. B

## PTAI-index 44,4%

Elevating a client from lying to sitting at the edge of bed.

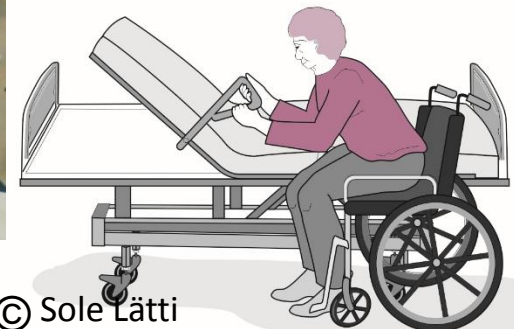
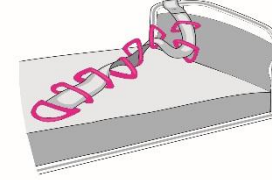
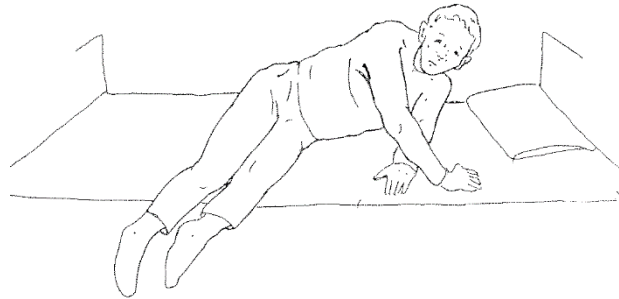


Task	Conventional kN	Optimized kN	Optimized + small aids	Risk -level
Elevating a patient from lying to sitting at the edge of the bed	5.0 (3.3 - 6.2)	2.7 (2.0 – 3.6)	n.a.	In all case except yellow and green conditions
				Opt technique and partly co-op patient
				Opt technique and fully co-op. patient
Ergosolutions/ tamminen-peter 2015				13



# Several ways to assist a patient from a laying to a sitting position

- The patient may find support by gripping either the bed rail or using a rope ladder (Flexigrip).
- From a side position the patient may push himself up on to his elbow and to a sitting position.
- Should the patient not quite manage on his own, the nurse may activate patient's shoulder- and forearm-push, whereby it is important that both patient's head and shoulders remain inclined forward at all time.



# Do not manually lift patients, whose legs cannot support their weight.



Re Turn 7500



Task/ Compressive force L5 –S1	Conventional kN	Optimized kN	Optimized + small aids	Risk-level Dortmund approach
Assisting the patient from bed’s edge in a chair or vice versa	5.1 (3.8 - 6.5)	3.7 (2.3 - 4.4)	3.1 (1.6 - 5.3)	In all cases except yellow and green conditions
				Opt technique or small aids
				Small aid + fully cooperative pat. max. 70 kg
Ergosolutions/ tamminen-peter 2015				15

# Results of Tartu Nursing Home

based on 7 videoclipped transfers, Nursing Home visits and an interview of one nurse

## Summary of the PTAI- results

Mobility level	patient	load index	solutions
A	Mrs A	no risk	
B	Mrs B	no risk	higher bed or rising blocks
C	Mrs C Mr D	no risk	support rail
D	Mr C	59,0 %	safer sling + training
E	Mr A Mr B	42,2 % 53,5 %	slide sheet and training

**When the result is under 60 %, the employer should take measures to improve ergonomic working methods.**

**A - C-level patients managed to move by themselves;  
there is no risk for the caretaker but the patient's safety can be meliorated by making ergonomic improvements.**

# Safe Handling Policy (Management model)

## 1. Assess the risks

- Risk assessment is a starting point in the management of physical loads.

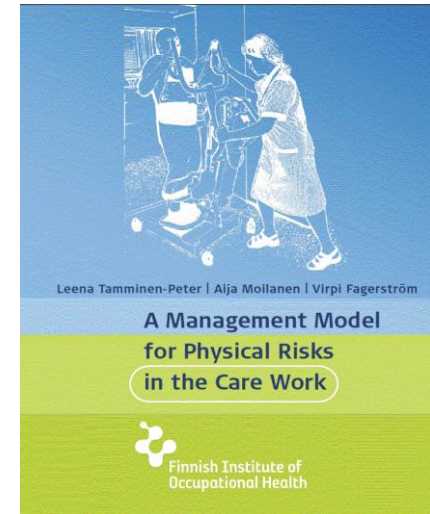
## 2. Plan

- **The planning group** ought to consist of at least a manager, a worker and one of us partners.
- The group plans the organisation's **Physical risk management model** (safe handling policy), whereby the organisation commits itself to actions to reduce risks (goals, measures, the responsibilities of line managers and staff and co-operation)

## 3. Implement

- Carry out the planned measurements to make work practices safer.
- Test and evaluate the feasibility of the ergonomic solutions

## 4. Monitor implementation

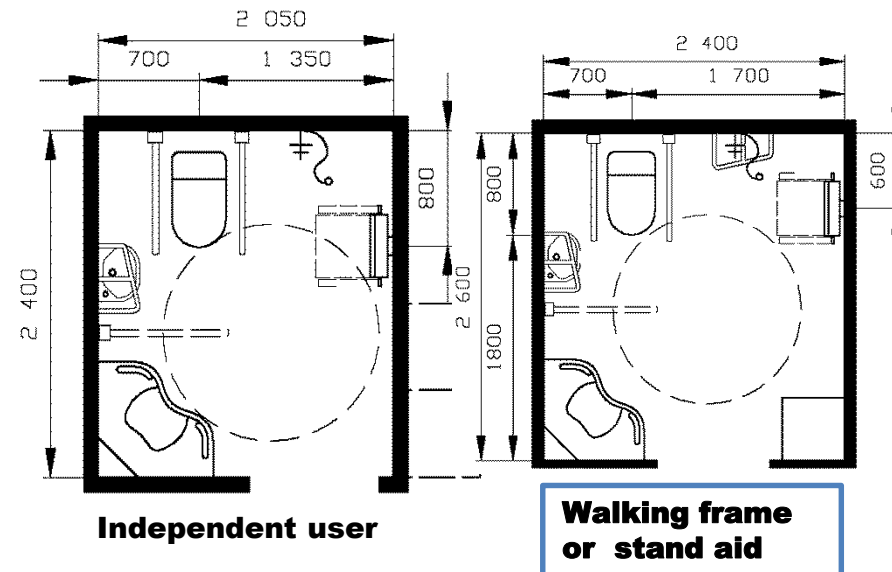


# Toilet and shower

The Finnish architect Dr. Pirjo Sipiläinen has tested how elderly persons best manage in toilets and how much space they need. (Demands on dwellings for the elderly in home care). Aalto-universitiy 4/2011)

## Needs:

- Support beside the toilet when the person stands, turns, sits down and stands up.
- Space for an assistant.
- Non slippery floor surface.
- No threshold.
- Correct height of the toilet seat (42-53 cm).
- Support rails (~20 cm higher than seat).



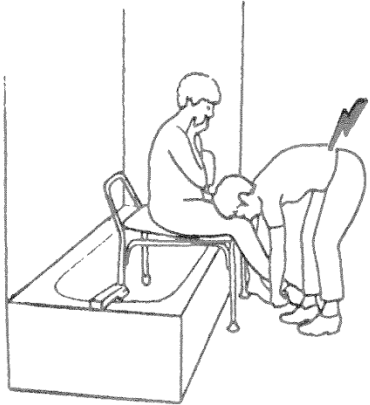


# Space recommendations for toilets and showers

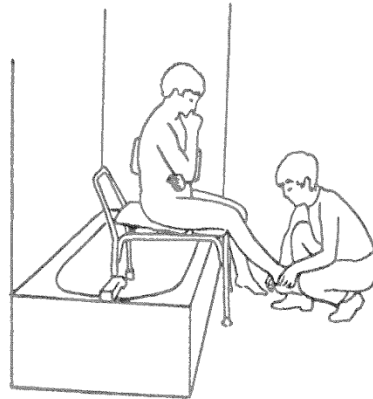
Toilet-shower / user	Width m	Lenght m	Area m <sup>2</sup>	Reference
Toilet / shower Independent user	2,4	2,05	4,92	Sipiläinen 2011
Toilet / shower Walking frame or stand aid	2,4	2,4	5,76	Sipiläinen 2011
Wheel chair user	2,7	1,5	Min. 5,5	RakMK, F1 2005
Toilet / shower	2,52	2,01	5,04	Hlgnett et.al . 2008
Toilet/shower in en-suite Wheel chair user			7,2	NHS Estates 2005
Assested wheel chair user			8,6	
Toilet/Independent user (Albert)	2,0	2,0	4.0	ArjoHuntleigh guidebook
Barbara with walking frame				Architects & Planners 2014
Toilet/ Wheel chair user and hoists Carl and Doris)	2,2	2,2	4,84	ArjoHuntleigh guidebook
Ceiling lift (Doris)	1,5	2,2	3,3	Architects & Planners 2014



# To avoid Static postures when washing and treating feet



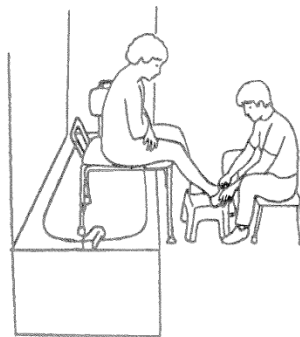
Unsafe position :  
Bending over.



1. Less dangerous position :  
A squatting position is less stressful for the back, but more stressful for the ankles and knees.



2. Less dangerous position :  
Kneeling on a gardening



3. Safer position :  
Sitting on a stool, back straight.

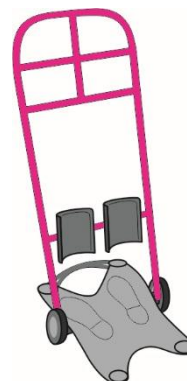


# Recommendations in Tartu

- **Wider space** in the E and D-level patients' rooms.  
It would be good to be able to assist such patients from both sides of the bed.
- There were **height adjustable beds** for patients who needed a lot of care, but more such beds are needed.  
In some cases rising **blocks** would solve the problem.  
This type of patient would also benefit from a rail support at the bed (pic 1).
- There were some assistive devices, but they were not in proper usage.  
There is a need for more assistive devices and training of how to use them.



Pic 1. Rail support at the bed.





# Recommendations in Oulainen

- Risk can be reduced in all cases if the environment is improved (higher or height adjustable beds) and some assistive devices like rail support to the bed and sliding material in the bed.
- Clients themselves or their relatives often resist both usage of assistive devices and any alterations at home. One way to influence on this attitude is by information about ergonomics, patient and work safety and patient transfer issues.
- **A written newsletter** of the Home care work for the customers. Such newsletter is to contain information about ergonomics, patient and work safety and patient transfer issues.
- **Safe patient handling guidelines should be introduced.**
- **Patient handling skills of the staff should cover at least the following topics:**
  - **Activating the patients' natural movement pattern**
  - **Assisting patients from lying to sitting at the edge of the bed**
  - **Assisting sitting patients to stand up and sit down into the wheelchair**
  - **Using helping devices**