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Building ergonomic hospital

What should ergonomic hospitals look like?

Social partners' conference on approaches to the issue of musculoskeletal disorders

Paris 25.3.2015



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Hôtel-Dieu, Beaune



Content of my presentation

How to build ergonomic

- Patient rooms ?
- Hygiene care facilities?



How to take care of heavy loads ?

- Patients,
- Laundry , Rubbish

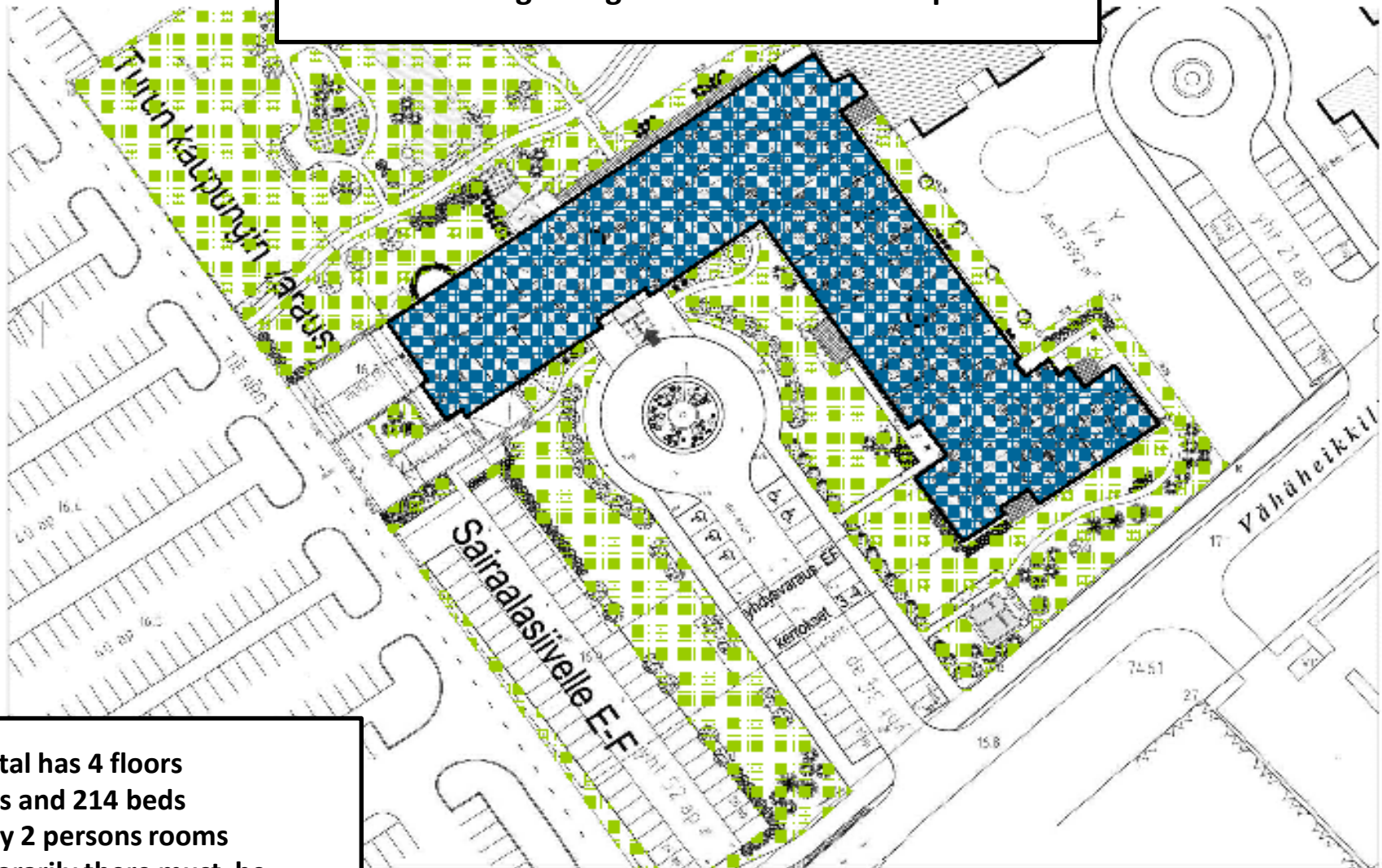
- New geriatric hospital building in Turku, 2007-2009
- Ergonomic reward 2009

Basic principles for design

- Design for All , Accessibility
- Usability
- Adaptability
- Patient –orientation and Safety
 - Care is based on patient’s needs
 - Privacy (1-2 person rooms)
 - Cosiness
 - Patient’s and worker’s safety
 - e.g. Automatic fire springling system in the whole building



There is a green garden around the hospital.



- Hospital has 4 floors
- 7 units and 214 beds
- Mostly 2 persons rooms
- Temporarily there must be room for 400 patients

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A model room helped to detect possible problems

- The model room is a working concept where the patient room is built with all the technologies in size 1 : 1
- A multi-professional work group played an important role in testing all possible activities
- Also FIOH tested patient hoists in the model room
- The testing in the model room led to several changes of plans regarding:
 - Room layout
 - Shower / toilet facility
 - Windows
 - Colours
 - Piping



Manual handling of people in the health care sector (CEN ISO TR 12296)

gives guidance on analysing and identifying deficiencies in various different spaces in which patients may be handled.

The following environments are included:

- **Adult bed space** – *general medical/surgical ward*
- **Hygiene facilities**
- Intensive care units
- Operating rooms
- Ambulatory procedure unit
- **Elderly care facility**
- Other – *Bariatric facilities, Obstetric, Emergency department*
- Diagnostic department
- Primary care
- Circulation spaces, clearance – *corridors, access/egress, turnings*
- Flooring surfaces, elevators, stairs
- Doors, grab handles, hand rails

CEN ISO TR 12296:2012 is available for purchase via the internet in <http://www.iso.org>.



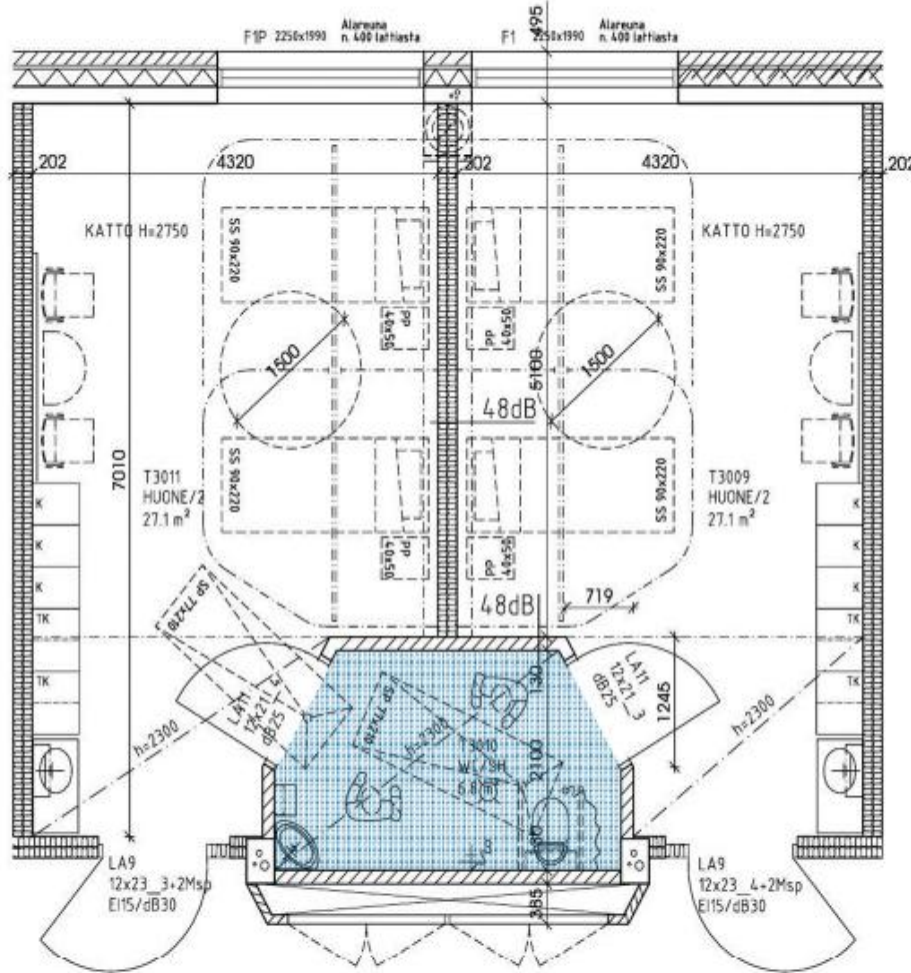
Bed space recommendations

Bed space / task	Width m	Length m	Area m ²	Source
Hospital bed norm	3,66	3,96	14,86	American Institute of Architects 2006
Hospital bed norm	3,6	3,1	11,16	NHS Estates 2005
Hospital bed norm	3,18	3,41	10,84	Hignett ym. 2008
100+ size patient bed	3,93	4,23	16,61	Hignett ym. 2007
If many horisontal transfers	-	-	17,54	Hignett ym. 2007

In multi-bed rooms, a clearance of at least 1,22 m at the foot of each bed should be provided to allow passage of equipment and beds

Two 2 persons rooms and shared hygiene facility

C-SIIVESSÄ:
 HUONEEN SYVYYS 7330mm
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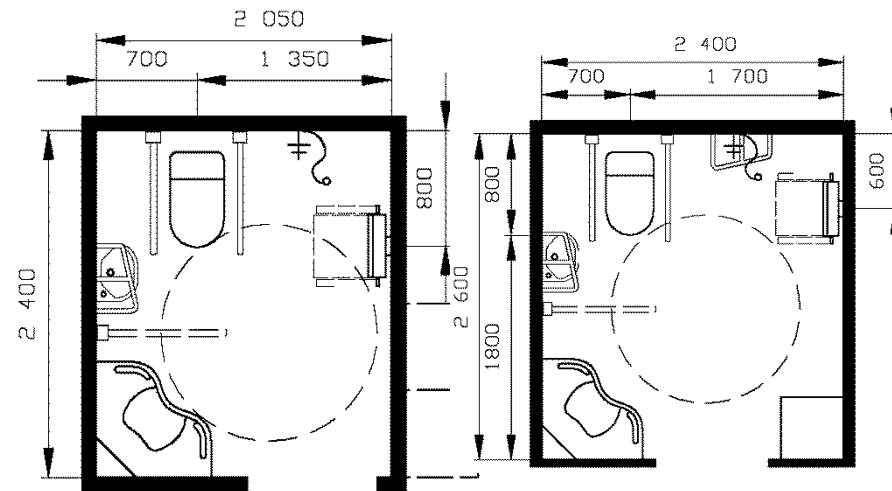
Two persons room



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-universtiy 4/2011)

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



Space recommendations for toilets and showers

Toilet-shower / user	Width m	Length m	Area m ²	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 and 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 and Planners 2014



SUUNNITTELUVAIHEEN MALLIHUONEEN SH-WC

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Patients, C, D, and E-level are assisted by ceiling or mobile lifts



Mobility level D with ceiling lift or mobile lift



Mobility level C with standing aid

Automated laundry & rubbish service



Communal living quarter



The Balcony



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Take to home message

Quality of care and safe working practices

can be achieved by

- ergonomic surrounding,
- right usage of mechanical aids &
- safe working techniques



Ergonomic Patient Handling Card®

Holders prove of their competencies after having passed the Standardised Finnish National **Ergonomic Patient Handling Card®** -education scheme exam.

Nursing students' education in patient-handling in Finland



43% of respondents taught drag lift

- The survey revealed the existence of wide variation in instruction among schools. The allocation of training time in Finland was sufficient in only one collage but remained with 3-4 hours or none below recommendation (Rantsi 2005).

The problems were:

- Physically strenuous and unsafe patient-handling methods were commonly taught.
- Insufficient practical training at school.
- Not enough time to practise the use of lifts and helping devices.
- Students often learn away good practises at trainee placements instead of deepen their skills.

Drag Lift



In Finland it has been trained since the middle 80:s, that the drag lift is not recommended !

- **Not recommended, ineffective and dangerous for the nurse; painful and brutal for the patient (Troup ym. 1981)**
- **Compressive force on diskus too high (Khalil ym 1987).**
- **Disk pressuræ 6 000-6 400 N (Marras 1999)**
- **May cause pain, soft tissue injury, gleno-humeral dislocation and even fracture of the humerus.**
- **Prevents the patient from using his/her arms.**
- **May encourage a feeling of helplessness. It discourages normal movement and therefore restricts independence and impedes rehabilitation.**
(The guide to the Handling of People 2005)

How to create a change ?

- Change must take place at the same time in both the workplaces and the vocational education.
- The idea of the Ergonomic Card[®] was introduced in the Interactive Communication Network of Patient Handling Ergonomics.
- Development of the evidence-based ergonomic teaching scheme in safe patient handling 2007-2009.
- **The Finnish Ergonomic Patient Handling Card[®]**



The Ergonomic Patient Handling Card[®] -learning scheme

Patient handling skill

The card is registered and standardized.



4 200 people are card holders and 272 have an instructor training in March 2015

Ergonomic Patient Handling Card[®] scheme

The aim

- to define the competencies, skills and knowledge levels needed to be able to perform the patient transfers safely
- to ensure compliance with legislative requirements
- to improve patient's safety and the quality of care
- Through the exam, nurses can prove their competence

For whom

- social and health care professionals
- students in the social and health care sectors
- all who assist others in moving.

Trainer –education for 2 days

- teachers of social and health care sector
- ergo-couches
- occupational physiotherapists
- health care workers



Aim of the survey (2014)

- What changes have taken place **in vocational nursing training and in work places** since Card's introduction in 2009?



Results January 2014:

EPHC[®] training in the Vocational education (n=28)

	Vocational colleges (n=22)	Polytechnics (n=6)
Compulsory	3	2
Optional	12	2
Supplementary	14	4

Rovaniemi long term unit

- **The long term care unit in Rovaniemi** with 36 patients needing physically demanding assistance
 - Started the EPHP® training in 2009, training 2 nurses
 - Now in 2014 the unit has 10 EPHP® trained nurses and 1 EPHP® instructor.
- **Assistive devices in use:** 3 hoist plus from 2009 to 2014 purchased sliding gloves, walking belts, different sliding material and 2 standing aids, for which they invested 6 000 euros.
- Their four-year statistics, 2009 – 2012, revealed a 600 days' sick-leave reduction. This resulted in the unit being awarded the Wellbeing Prize in 2012.
- ***In 2009 they had over 900 sick leave days and in 2012 300 days. Economically it means: $600 \times 300 \text{ euros} = 180\,000 \text{ euros}$. Investment for training and acquisition amount to -approx. 20 000 euros .***