Building ergonomic hospital

What should ergonomic hospitals look like?

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

Paris 25.3.2015
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
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**.

Tamminen-Peter, Ergosolutions 2015
# Bed space recommendations

<table>
<thead>
<tr>
<th>Bed space / task</th>
<th>Width m</th>
<th>Length m</th>
<th>Area m²</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital bed norm</td>
<td>3,66</td>
<td>3,96</td>
<td>14,86</td>
<td>American Institute of Architects 2006</td>
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<tr>
<td>Hospital bed norm</td>
<td>3,6</td>
<td>3,1</td>
<td>11,16</td>
<td>NHS Estates 2005</td>
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<tr>
<td>Hospital bed norm</td>
<td>3,18</td>
<td>3,41</td>
<td>10,84</td>
<td>Hignett ym. 2008</td>
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<tr>
<td>100+ size patient bed</td>
<td>3,93</td>
<td>4,23</td>
<td>16,61</td>
<td>Hignett ym. 2007</td>
</tr>
<tr>
<td>If many horizontal transfers</td>
<td>-</td>
<td>-</td>
<td>17,54</td>
<td>Hignett ym. 2007</td>
</tr>
</tbody>
</table>

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
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

<table>
<thead>
<tr>
<th>Toilet-shower / user</th>
<th>Width m</th>
<th>Length m</th>
<th>Area m²</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet / shower</td>
<td>2,4</td>
<td>2,05</td>
<td>4,92</td>
<td>Sipiläinen 2011</td>
</tr>
<tr>
<td>Independent user</td>
<td>2,4</td>
<td>2,4</td>
<td>5,76</td>
<td>Sipiläinen 2011</td>
</tr>
<tr>
<td>Toilet / shower</td>
<td>2,52</td>
<td>2,01</td>
<td>5,04</td>
<td>Hignett et.al. 2008</td>
</tr>
<tr>
<td>Toilet / shower in en-suite</td>
<td>2,0</td>
<td>2,0</td>
<td>4.0</td>
<td>ArjoHuntleigh guidebook</td>
</tr>
<tr>
<td>Wheel chair user</td>
<td>2,7</td>
<td>1,5</td>
<td>Min. 5,5</td>
<td>RakMK, F1 2005</td>
</tr>
<tr>
<td>Assisted wheel chair user</td>
<td>7,2</td>
<td>8,6</td>
<td></td>
<td>NHS Estates 2005</td>
</tr>
<tr>
<td>Toilet/Independent user (Albert)</td>
<td>2,0</td>
<td>2,0</td>
<td>4.0</td>
<td>ArjoHuntleigh guidebook</td>
</tr>
<tr>
<td>Barbara with walking frame</td>
<td>2,2</td>
<td>2,2</td>
<td>4,84</td>
<td>Architects and Planners 2014</td>
</tr>
<tr>
<td>Toilet/ Wheel chair user and hoists Carl and Doris</td>
<td>2,2</td>
<td>2,2</td>
<td>4,84</td>
<td>ArjoHuntleigh guidebook</td>
</tr>
<tr>
<td>Ceiling lift (Doris)</td>
<td>1,5</td>
<td>2,2</td>
<td>3,3</td>
<td>Architects and Planners 2014</td>
</tr>
</tbody>
</table>
Patients, C, D, and E-level are assisted by ceiling or mobile lifts.

Mobility level D with ceiling lift or mobile lift

Tamminen-Peter Ergosolutions 2015

Mobility level C with standing aid
Automated laundry & rubbish service
Communal living quarter
The Balcony
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

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.
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 pressurae 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.
- The Finnish Ergonomic Patient Handling Card®
The Ergonomic Patient Handling Card® -learning scheme

The card is registered and standardized.

4200 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?

– Have teachers been able to integrate the content of the passport into the studies of physiotherapy and nursing students?
Results January 2014:
EPHC® training in the Vocational education (n=28)

<table>
<thead>
<tr>
<th></th>
<th>Vocational colleges (n=22)</th>
<th>Polytechnics (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Optional</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Supplementary</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>
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 x 300 euros = 180 000 euros. Investment for training and acquisition amount to -approx. 20 000 euros.