Ergonomic criteria and good practices for bariatric patients' care

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During 2014-2015, the Satakunta Hospital District carried out the "Sataplus – ergonomic criteria and good practices" development project to support moving of bariatric patients. The aim of the project was to improve ergonomics and work safety when handling bariatric patients. Market survey of XXL-sized products was done, as well drafting ergonomic criteria for assistive devices and planning the policy for bariatric care to provide patient centred care in a safe and dignified manner. All the results of the project are gathered in the guidebook which is available on the internet in Finnish.

Keywords: Patient handling, ergonomic criteria, bariatric patient

1. Introduction

The obese population (BMI > 30) is growing globally. In Finland 20% of the population is obese, for Europe it is 17 - 33 % (Männistö et al. 2012). The Finnish obesity is slightly above the European average, but lower than in Southern Europe and the UK. Hignett et al (2007) was looking at the bariatric pathway in the UK and identified five key risk areas: patient factors, building space & design, manual handling, clinical equipment & furniture, communication- & organisational- & staff-issues. In Finland, the problem is not as serious as in the UK however, the Finnish health care facilities are not sufficiently prepared to manage bariatric risks. Manual patient handling can induce high loads to carers' musculoskeletal system. The care of these patients present a specific challenge, partly due to individual factors but mainly for policies, space, equipment, vehicles, treatment and transportation. Thus, in the Satakunta Hospital District, the need to develop bariatric patients' care emerged.

2. Methods

Surveys about the current care practice and existing assistive devices in five pilot wards were carried out by means of both a questionnaire and the Care Thermometer (Knibbe and Knibbe 2012) to obtain a physical load assessment. An equipment and furniture survey were conducted to identify the range and availability of suitable devices for people weighing over 150 kg or BMI > 40 and/or having a hip width over 86 cm. Mapping of bariatric patients' journeys from home, for an emergency admission, to and through the hospital was carried out to identify the major risks. An action model for bariatric patient care was planned based on the research evidence of manual

handling and bariatric protocols in USA and UK (Duke University Health System 2009, Smith J. et al. 2011)

3. Objectives

The aim was to improve ergonomics in manual handling in general and especially with regard to bariatric patients, by drafting ergonomic criteria for assistive devices, and by planning the policy for bariatric care to provide patient centred care in a safe and dignified manner.

4. Results

4.1. Baseline survey in the pilot wards

The questionnaire survey and the physical load assessments identified that manual handling of heavy patients and their transporting in their beds were the biggest risks. There were not enough assistive devices in all other wards except the surgery unit. Contrary to the head nurses' belief the staff was not able to use all assistive devices. The Care Thermometer -results revealed, that the usage of hoists should be improved with D-level patients. The number of the normal size beds (80 cm) was enough, but there were too few wider beds (≥ 90 cm). The spare beds were stored in the corridors. For the usage of assistive devices, most toilets were too small and the doors to the patient rooms and toilets were too narrow (80 cm).

4.2 Criteria and market survey for beds and hoists

For the care of bariatric patients, XXL-products have been developed; they are made from stronger material for a higher carrying capacity. The most important furniture for both patients and care providers is the bed. In addition to the 80 cm wide medical bed, there were 90, 100 and even 122 cm wide beds available in the market. However, a bed should not be so wide as to force the nurse to overreach. For the bariatric bed, the crucial criteria were a larger sleep surface and lateral stability. Safe working load (SWL) varies from 180–450 kg and the bed must be marked with the corresponding maximum patient weight (SFS –EN 60601-22-52/A1 2010), which is usually 35–50% less than SWL. Besides the width and carrying capacity of the bed, the important features are height adjustability, the height of side rails, a sufficient length of the seat part and a possibility to rise into a sitting position. Desirable are, access and egress via the foot end, as it might be easier for some bariatric patient than via the side of the bed.

The maximum capacity of different hoist types in the Finnish market was: ceiling hoists 455 kg, twin motors 500 kg, the mobile hoist 385 kg and the sit to stand hoists 250 kg. For bariatric patients, hoists are essential pieces of equipment. Overhead ceiling hoists have been tested to be easier manoeuvrable than mobile hoists (Rice et.al. 2009). Important criteria are sufficient length of the spreader bar, a four to six-point spreader- or horizontal level spreader-bar. Important for the mobile hoists are the caster type with ease of pushing and slings bearing the working load safely.

4.3 Recommended furniture and assistive devices for the bariatric patients

As the need of XXL–products varies from ward to ward it is rational to buy or lease them to joint ownership, set up a mutual storage and entrust a person with their maintenance and advising others in their usage. Recommended furniture and assistive devices for bariatric patients in a medium sized hospital are listed in Table 1 and example of the bariatric devices in figures 1 and 2.

Table 1. *Recommended furniture and assistive devices for the bariatric patients*

Bed width (≥90 cm) with stronger frame	4
Bariatric hoist and scale	1
Bariatric manual wheelchair	2
Bariatric sit to stand lift	1
Bariatric commode chair	1
Shower chair with commode	1
Shower trolley (450 kg SWL)	1
Bariatric Walker/ Frame	1
Bariatric ford	1
Power drive assists for ease of transport	1
Position Cover	2
Sliding turning sheets, Sliding materials and boards	

Figure 1. Bariatric shower chair with commode

Figure 2. Bariatric wheelchair

4.3 Environment

There should be sufficient space for the equipment to perform the tasks using good body dynamics and posture. Hignett and Lu (2007) carried out functional space experiments to determine the needed space for different tasks with bariatric persons. Also, the ArjoHuntleigh guidebook for architects and planners gives instructions (Table 2).

Table 2. Functional space for bariatric patients with different mobility levels.

Patient Mobility level	Width (m)	Length (m)	Area (m^2)	Reference
BMI -> 40	3,93	4,23	16,61	Hignett and Lu (2007)
A -level	3,58	3,13	11,21	Arjo Huntleigh (2014)
D-E -level	3,58	4,53	16,22	Arjo Huntleigh (2014)

As wider than normal beds (width of a 90 cm plus side rails = 100 cm) require wider doorways. Advance consideration is to be given as to, which rooms and elevators can be used, the table capacity of operation theatres and X-rays, the tube dimensions of CT, MRI, and the mortuary environment.

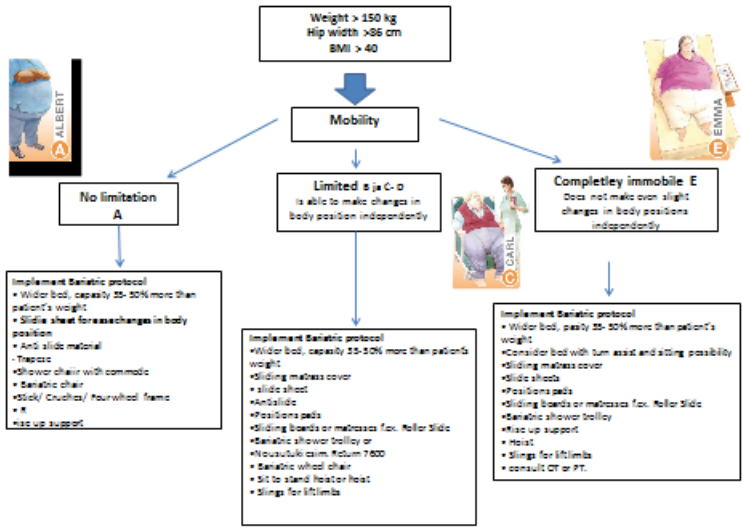
4.4 The action model to take care of bariatric patients

It is good to map the patients' journey from home, for an emergency medical admission, to the caretaking ward to pinpoint possible problems. For example, what is the carrying capacity of the ambulances? It is advisable to notify the hospital of a bariatric patient's arrival to allow preparation of the appropriate equipment and staff.

In the admission of the bariatric patient the functional capacity and risks are to be assessed by:

- weighing the patient and counting his BMI,
- applying the Care Thermometer, FIM or Rafaela –scale to assess functional capacity
- evaluating patient's ability to move and the situations in which he needs assistance,
- applying the algorithm to choose needed assistive devices and furniture (Figure 3.)
- considering into which ward and room the patient can be placed
- how many carers will be needed ?

Fig. 3. Algorithm guides to choose furniture and assistive devices for different levels of bariatric patients.



Bariatric patients have a high decubitus risk. Skin folds require daily check -up and usage of position pads to prevent skinfolds from pressing each other. Every two hours repositioning is crucial. To make repositioning easier, different sliding materials are needed on the bed. If the patient is completely immobile the hoist is to be used also for turning the patient and not only for lifting him. Repositioning of a mobile patient in bed, using a friction reducing device, is estimated to require one caregiver per 45 kg of patient weight (ArjoHuntleigh guidebook 2014). The manual lifting and supporting of limbs can be a high-risk task. If the patient's weight is 150 kg, his leg is weighing 24 kg

or more, therefore, the recommendation is to use a mechanical device e.g. hoist and slings (Waters et al. 2011) to perform the transfer.

In order to apply the new action model, all staff in the pilot wards underwent a new assistive device training. Dissemination of the results of the project and training will continue.

5 Conclusion/perspectives

Health and safety legislation places a responsibility on the employer to provide a safe system of work supported by policies and procedures (Safety and Health Act 738, 2002). The Satakunta Hospital District has followed these rules and recorded the results of the project in the SATAPLUS -guidebook, which is freely available in Finnish on the internet and contains much more information than this article. As evidently the bariatric population is increasing, a proactive rather than reactive approach to caring for these people is needed.

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