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CLINICAL PRACTICE

Manual handling risks associated with the transportation of bariatric patients in Australia

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Objectives

Identify the factors that affect the risks and the adoption of risk control measures during the care of bariatric (morbidly obese) patients by paramedics and fire fighter first responders in Australia.

Methods

Focus groups were conducted in neutral locations in two Australian state capitals; a suburban region of Melbourne which straddled the rural and metropolitan boundaries; and a large regional Victorian town.

Results

Carers of bariatric patients are exposed to manual handling injury risk throughout the journey that bariatric patients take within the healthcare and funeral systems. In focussing on paramedics and fire service first responders, as key groups within that journey, it was found that the risks are significant but are not quantifiable. The injury risk is influenced by the nature and design of the range of environments within which patient movement is undertaken; the limited range of handling equipment available for use with bariatric patients; and the efficacy of organisational procedures and training. Adoption of risk controls is hampered by the absence of a standard definition of the term “bariatric” and gaps in the information flow during the bariatric patient journey through the health care system. Various definitions of bariatric are applied in different sectors and there are limitations to the use of both weight and body mass index in those definitions.

Conclusions

There is a lack of knowledge about how to safely manage the unique needs of bariatric patients. It appears that few streamlined systems have been established for patient management, and many cases are managed as if they are an isolated experience. There is little documentation of systems or case studies and thus very little sharing of the knowledge. Improvements in manual handling risk control for carers requires greater inter and intra-industry collaboration, which in turn requires an agreed definition of “bariatric”.

Keywords: *bariatric; emergency medical services; emergency services; manual handling injury; obesity*

With obesity becoming more prevalent globally, it has been observed that morbidly obese (bariatric) patients are increasingly over represented in the use of healthcare services.¹⁻⁴ Hignett et al¹ described bariatric patients' access to in-patient and out-patient treatment as a journey. This journey commences with transport from the patient's home by ambulance. On arrival at the hospital as an out-patient the journey continues through to locations of specialist departments such as radiography or as an in-patient, through to a ward, and subsequently to specialist departments or potentially to theatre. On completion of treatment, the journey resumes with the transfer by ambulance to home or another institution. If treatment is unsuccessful, deceased patients are transported via the mortuary to a funeral home and finally to the funeral ceremony. At each point in this journey, the movement of a patient presents challenges for the carer^{5,6} and exposes them to risks.

While carers are exposed to risk throughout the journey that bariatric patients take within the healthcare systems¹ investigation of those risks is limited and the literature focuses almost exclusively on the hospital and health care institutional setting. It is generally considered that efforts to reduce injuries to carers are based on tradition and personal experience rather than scientific evidence.^{3,7,8}

In Australia in 2004-05, some 41% of adult males and 25% of females were classified as overweight (BMI of between 25 and 30) and 18% of males and 17% of females were classified as obese (Body Mass Index over 30). When comparing these figures to results from 1995, using the same measure, the proportion of adults classified as overweight or obese was found to have increased substantially.⁹

Morbid obesity has been variously defined, and is considered by some to be the point at which a person has a Body Mass Index of more than 30.¹⁰⁻¹² However, other authors report it to be the point at which a person has a BMI of more than 40.^{2,13,14} Alternatively, some researchers have referred to weight alone to indicate whether or not patients can be defined as morbidly obese and have suggested that the level of morbid obesity has been reached when patients exceed their ideal weight by more than 45 kilograms.⁵

However it is not BMI or weight alone that impacts on carers of bariatric patients. As well as weight, the risks to carers of bariatric patients are compounded by complications that are associated with shape, mobility and cooperation. Bariatric patients generally have limited mobility and decreased lung capacity, which reduces their ability to assist in movement.² The risk of injury to carers is increased because care givers may be responding reactively, increasing the risk of sustaining musculo-skeletal injury^{1,7,11,15} and increasingly exceeding the weight limits of the various hoists and slings that may be used for moving patients.¹⁶ Other factors associated with the bariatric patient's clinical condition and treatment which potentially increases the manual handling risk to carers include, levels of comfort or pain, the need for privacy, and concern for dignity.^{1,8,11,17,18}

While carers from all stages of the bariatric journey were involved in a series of focus groups relating to the handling of bariatric patients, this paper reports on issues associated with the handling of bariatric patients by ambulance paramedics and fire service first responders. In some states of Australia, fire service personnel provide first responder care to patients for the purposes of preserving life until paramedics can attend. While not being required to transport patients, fire service personnel may be required to move patients for the purposes of treatment and they are at times requested to assist paramedics with movement of bariatric patients. For example, fire service personnel often find that a patient's bed provides an unsatisfactory base for effective cardio-pulmonary resuscitation (CPR) in a first response situation and thus patients must be moved to the floor before CPR may commence.

Methodology

Four focus groups were conducted using a focus group methodology described by Krueger and Casey.¹⁹ A total of 19 participants were involved in four group meetings held between 16th May, 2008 and the 27th May, 2008 in neutral locations in two Australian state capitals (nine participants); a suburban region of a state capital which straddled the rural and metropolitan boundaries (seven participants), and a large regional Australian town (three participants).

Participants, who were males and females over the age of eighteen, were recruited from within the primary health care sector, ambulance services, fire services and funeral businesses within the vicinity of each of the locations listed above.

All participants were invited to contribute to a discussion around the structured question route designed to elicit information pertaining to the handling of bariatric patients. Specifically, information was sought regarding; the OHS risks to which carers are exposed when moving bariatric people; working environment factors that limit the ability of employees to safely handle bariatric people; the strengths and weaknesses of the equipment used to handle bariatric people; the nature and value of training and education that employees receive in regard to movement of bariatric people; and any procedures that organisation uses to control risks while moving bariatric people.

Research Ethics approval for data collection through the focus groups was granted by the University of Ballarat Human Research Ethics Committee (HREC).

Results and Discussion

It was found that the manual handling risks to paramedics and fire service first responders are significant but are not quantifiable; anecdotally, there are injuries associated with incidents involving bariatric patient movement but these are difficult to isolate from incidents and injuries associated with general patient movement. It was found that the rapid movement of obese persons from fire situations is an increasingly significant problem for fire fighters as is the effective performance of CPR on obese patients during first response situations.

In general, it was found that the risk to paramedics and fire service first responders is influenced by the design of the range of environments within which patient movement is undertaken; the limitation of equipment; the provision of education and training, and the use of written procedures.

Work Environment

It was found that the degree of control of the work environment significantly influences the risk to paramedics and fire service personnel who work largely in uncontrolled environments. This is supported by anecdotal reports in the literature.^{1,20,21} In regard to bariatric patient handling, those environments are generally residential dwellings. Ambulance service representatives made the point that such environments are often designed for ambulant people, and factors such as room size, corridor width, stair width, gradient and safe working loads can limit the use of equipment and present considerable manual handling problems. A number of participants reported the removal of door frames to move bariatric patients. A comment was made that some bariatric patients are attracted to country areas where the cost of housing is lower and where "supported housing" may be available. These properties are not only limited in size but are also remote to population centres where facilities to assist with

health care and patient movement may be otherwise available. The distribution and quantity of furniture and personal effects also present obstacles to handling equipment use. The additional staff needed to assist with care and movement of bariatric patients are not readily available or easily accommodated within the confines of the dwelling. Removal of the patient can require the removal of doors and windows and sometimes the use of powered equipment such as cranes. Environmental factors associated with surroundings of the dwelling can limit close access by vehicles and wheeled equipment. Ideally the vehicle should be positioned as close to the dwelling as possible, however, access may be limited by topography, fences and other obstacles.

At the hospital, ambulance services have limited control over the environments they encounter; an example proffered related to an ambulance bay where for drainage purposes the surface was sloped and included a ridge, both of which impeded trolley movement.

Equipment

Equipment for patient transport has been a significant issue for emergency services in the past. Not only are vehicle weight capacities limited, but also equipment such as stretchers have limited weight capacity and the combined weight of the stretcher and the patient may exceed the capacity of restraints in emergency vehicles in the event of sudden deceleration. While some participants reported previous use of furniture vans to move patients that were too large to be transported by ambulance, at the time of the research the South Australian, New South Wales and Victorian Ambulance services all reported having fully equipped bariatric transport vehicles.

The cost of dedicated equipment and vehicles in some cases prohibits the deployment of resources in locations other than major centres. Thus availability in rural and regional areas is generally limited to planned, rather than emergency transportation. Transport by air from regional locations is again limited by load capacity. It was reported that on one occasion, the combined weight of the stretcher, patient and ancillary equipment meant that attending staff would have exceeded the capacity of the aircraft, and as such, paramedics had to be left behind.

Representatives of one service reported that it had invested in specialised equipment including air jacks, patient slides, and powered stretchers. However, a power source upon which some items are dependent is not always available at the point of patient collection. The size and congestion of domestic dwellings can also prevent the use of equipment in patient movement.

Focus group participants reported that the equipment available for use during the bariatric journey is often limited in terms of its capacity to support the weights, shapes and sizes of many bariatric persons. Equipment is often designed to handle patients that tend towards the rectangular shape of patients with a normal weight rather than the more typical square shape of a bariatric person. Within the square shape, the patient's weight is often distributed unevenly and generally falls into one of a number of categories.²² These include severe generalised oedema, a high upper body weight with either a rigid abdomen or an abdomen that hangs to the floor, weight carried below the waist with either significant tissue between the knees or on the outside of the thighs, or excessive buttock tissue creating a protruding shelf. This uneven distribution of weight can not only negatively affect the stability of equipment but also its structural integrity.

Load testing of the equipment by the manufacturer is frequently stationary and assumes even distribution of weight. The movement of equipment under load or over a range of surfaces is rarely taken into account at the design stage. The findings regarding the limitations of

equipment are supported by reports from other countries.^{1,5,8,13,18,23} However, it seems that the problem is acute in Australia where much of the equipment in use is manufactured in the USA. Typically this equipment is labelled in imperial, rather than metric units and has been designed for US vehicles and hospital systems. Compatibility problems are therefore encountered when used with vehicles and other equipment in Australia. Occasionally differences in equipment used by services in different regions of Australia limit the cross border exchange of equipment during transfers.

The relatively small size of the Australian market for bariatric equipment limits the range that is imported and made available, as well as limiting the degree of design influence that may be brought to bear on manufacturers. The somewhat insular nature of the Australian states further limits collective influences.

Commentators from other countries have suggested that barriers to the use of equipment for bariatric patient movement generally fall into three categories - *equipment, the carer and the patient*. The main barriers cited in relation to equipment include; insufficient items; instability; weight limitations; difficult operation; storage issues; convenience of location; poor maintenance and cleaning; space restrictions to control equipment; and incompatibility of equipment. Barriers reported in regard to the carer include; lack of training; lack of staff awareness; a perception that equipment is cumbersome or otherwise inconvenient; inability to locate the equipment; and time constraints. In regard to the patient; aversion to the equipment; loss of a sense of control; feelings of insecurity; and discomfort are cited.^{1,8,24-26}

Rules and procedures

There is a growing body of evidence to suggest that comprehensive programs using mechanical equipment and having a written safe patient handling policy can significantly reduce the risk of musculoskeletal injuries.^{3,8,18,24,26,27}

The definition of “bariatric” was found to vary between hospitals and across sectors. Some rely on BMI, however, the BMI value used to identify bariatric patients often varies. Others rely on weights, although neither BMI nor weights account for patient shape and weight distribution. Inconsistencies in the definitions affect purchasing policies as well as procedures that inform decisions about calls for further staff to assist with manual handling tasks. Pre-hospital admission assessments are an important element of the bariatric journey and permit the planning of care and preparation of appropriate equipment prior to hospital arrival, however, the absence of consistent definitions means that triggers may not be being activated.

It is understood that one service is compiling a list of hospitals that are equipped for bariatric patient handling so that crews may be appropriately directed when transporting patients who require such specialised assistance. However, in regional and rural areas, choice of hospital is often limited.

Representatives of one service reported that in their case, every effort is made to obtain information about patient weight when a call is received. If it is established that the patient weight might exceed 170kg, a second crew is dispatched to the call location. However, it was reported that, in general, patient weight is unknown at the time a call is received.

“No lift” policies are reducing manual handling injuries in the health care sector²⁸ and when correctly implemented, have the capacity to satisfactorily assist with the management of bariatric patients. In institutions where ‘No Lifting’ policies have not been correctly implemented, or where personnel have not received adequate training in its operation, it was

found that the risk is to some extent being transferred to ambulance and fire services which are being called to move patients. One fire service is implementing procedures that will limit, and ideally, prevent the manual handling of any people in non-life threatening situations. Service representatives described a process whereby calls for assistance are filtered through an operations commander who will make a decision on whether or not to dispatch a crew to undertake the manual handling tasks, based on the circumstances of the particular case as described to them by the call centre. Caller identification information which is available to emergency service call centres can also be used to record additional information about particular addresses and may assist the operations commander to make informed decisions about a response to the call for manual handling assistance. However, concern for patient dignity and the welfare of colleagues in other services can compromise the application of the policy in practice.

Dignity is a major issue and the attention of neighbours and even media can influence the strategies that are used in patient movement. It was reported that consideration for patient dignity as well as clinical needs will frequently over-ride consideration of the crew's safety.

Training and Education

The dynamic environments within which paramedics operate, with patients' varying needs and circumstances, requires training that equips staff with the knowledge and skills to quickly and effectively assess manual handling risks and to move independently to appropriate control measures. Where bariatric equipment is in use, attempts are made to train paramedic staff in its use. However, the low availability of the equipment and the low frequency of its use mean that experience is limited.

A further limitation to the application of the knowledge and skills in practice is the overriding concern for dignity of the patient or the deceased. Staff will generally place patient care and dignity above their own safety.

Conclusion

There is an increasing awareness of the escalating bariatric problem in the community and the risks that carers face during the patient's journey through the health care system. However, in Australia there appears to be limited understanding of the entire bariatric journey among representatives of the individual parts or stages. Individuals understand their own role and, to some extent, that of the agencies they interact with in the preceding or subsequent stage in the journey, however, the totality of the journey is unclear. There is some misperception that the journey is linear.

Whether the patient movement is undertaken in the uncontrolled environment of the home, or the cemetery, or the controlled environment of the hospital, design features generally limit the use of equipment and the application of safe handling procedures.

Ambulance and fire services have generally developed policies and procedures that address the movement of bariatric patients and the purchase and use of equipment. Yet the efficacy of these procedures is hampered by the absence of a standard definition of the term "bariatric" and gaps in the information flow during the bariatric patient journey. While various definitions of the term "bariatric" are applied in different sectors, and there are limitations to the use of both weight and body mass index in those definitions, it is known that a range of factors beyond BMI and weight influence risk to carers.

Improvements in manual handling risk control for carers requires greater inter and intra-industry collaboration. This will not only improve the information flow during the bariatric patient journey but also provide opportunities for the industries to apply collective influence on equipment designers and suppliers.

Substantially more work is required to inform the development of intervention strategies that will lead to significant and sustained risk reduction. It is suggested that further work is required to develop a standard definition of “bariatric” and a definition that accounts for the size and shape of patients. Further work is also needed to quantify the frequency of bariatric patient movement within the emergency services across Australia. A clear representation of the journey and the interfaces between the agencies and carers and their respective roles would assist with the defining the problem and understanding the solutions.

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