MANUAL HANDLING RISKS ASSOCIATED WITH THE CARE, TREATMENT AND TRANSPORTATION OF BARIATRIC (SEVERELY OBESE) PATIENTS IN AUSTRALIA

MARCH 2009

Australian Government
Australian Safety and Compensation Council

Manual handling risks associated with the care, treatment and transportation of bariatric (severely obese) patients and clients in Australia

Acknowledgement

This report was commissioned by the Department of Education, Employment & Workplace Relations (DEEWR), Office of the Australian Safety & Compensation Council (OASCC). The research was undertaken by Dr Stephen Cowley and Ms Susan Leggett, VIOSH Australia, University of Ballarat (viosh@ballarat.edu.au) which provided this research report.

The authors wish to thank the many people in the health, funeral and emergency services sectors who very willingly and freely gave their time to share their knowledge and experience of the industry; offered their facilities and activities for observation; and travelled at their own expense to meet with the investigators.

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ISBN 978 0 642 32740 6

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Executive Summary

Bariatrics[1] is the field of medicine concerned with weight loss. The term bariatric has been variously defined and for the purposes of this research is associated with the care of patients who are morbidly obese. Some consider a person with a Body Mass Index (BMI[2]) that exceeds 30 to be bariatric. However, the Medical Services Advisory Committee of the Australian Department of Health and Ageing, along with the National Health and Medical Research Council (NHMRC), defines morbid obesity as being the point where a person has a BMI of more than 40. In 2008 the Baker IDI Heart and Diabetes Institute reported that overall, almost 4 million adult Australians were currently obese and that among middle-aged Australians around 7 out of 10 men and 6 out of 10 women aged between 45 and 64 years were overweight or obese. In 2004-05, some 41% of adult males and 25% of females in Australia were classified as overweight (BMI of between 25 and 30) and 18% of males and 17% of females were classified as obese (BMI over 30). The number of persons who may be considered bariatric is not reported.

There is an increasing awareness of the risks that carers of obese and bariatric patients face during the transport and movement of those

[1] The word bariatrics is derived from the Greek word “baros” meaning weight (Muir & Haney 2004)

[2] BMI = weight (kg) ÷ height^2 (m)

patients from home to the health care institution and then home again or, potentially to the mortuary and then funeral. This transport and movement of obese and bariatric patients has been termed “the bariatric journey” (Hignett et al 2007).

Research concerning the risks and measures to counter the risks to Australian workers are limited. Although there is literature that addresses some of the issues for health care workers, it is generally considered that in regard to patient handling, efforts to reduce injuries are often based on tradition and personal experience rather than scientific evidence.

In recognition of this, the Office of the Australian Safety and Compensation Council funded the project *Manual handling risks associated with the care, treatment and transportation of bariatric (severely obese) patients and clients in Australia*, to address the following research questions:

- What are the OHS risks associated with manual handling of bariatric patients to which workers such as nurses, ambulance officers, fire fighters, and those in the funeral industry in Australia are exposed?
- What measures (e.g. plans, policies, processes and equipment, supported by adequate training) have been introduced in Australia to reduce or eliminate the risks?
- How effective are the above measures?
- Where might further intervention be required to control the risk in Australian workplaces?

The exploratory research project was completed in three parts; (i) literature review, (ii) focus groups and (iii) case studies.

It was found that there is an growing 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, there appears to be a lack of knowledge about how to safely manage the unique needs of bariatric patients. There appear to be few streamlined systems 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.

The manual handling risks to carers are significant but are not quantifiable; anecdotally carers have suffered injuries associated with bariatric patient movement but these are difficult to isolate from incidents and injuries associated with patient movement in general. The injury risk to carers is influenced by the nature and design of the range of environments within which patient movement is undertaken. 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 application of safe handling procedures.

The range of handling equipment available for use with bariatric patients is limited and its effectiveness is compromised by the environments within which it is used. Most of the equipment available in Australia is imported and the range available is limited by the relatively small market in this country. The design of some equipment does not adequately account for the size, shape and weight distribution of bariatric patients and the small number of purchasers largely working in isolation from one another are limited in their ability to influence designers. Small businesses such as funeral directors are limited in their capacity to purchase specialised equipment given the relatively low frequency of use. All sectors involved in the bariatric patient journey find that equipment availability is limited in regional and rural areas.

Larger organisations such as hospitals and ambulance and fire services generally have developed policies and procedures that address the movement of bariatric patients and the purchase and use of equipment. The efficacy of these procedures is however hampered by the absence of a standard definition of the term “bariatric” and the gaps in information flow during the bariatric patient journey. 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.

At least one fire service in Australia is attempting to limit bariatric patient movement to emergency situations only. In this way, the service is attempting to reduce the risk of manual handling injuries to its own staff and transfer the risk to those services whose role is defined as including patient movement. Fire services have historically been associated with the provision of manual handling support to a range of other parties. Attempts to change this perception and the role of fire fighters will result in greater pressure on ambulance services and funeral businesses to develop patient handling solutions that they may use independently.

The funeral sector predominantly comprises small businesses and as such operates largely without formal or written procedures. Training and education is also limited and the processes for safe movement of patients are largely based on experience and observation of peers. Hospitals, ambulance and fire services generally do provide manual handling training to staff but the degree to which this addresses the specific issues relating to bariatric patient movement varies widely.

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 enable collective influence on equipment designers and suppliers.

The project has increased our understanding of the practical issues associated with the care and movement of bariatric persons during their journey through the health care system in Australia. This project was exploratory in nature and 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 in each of the following areas:

- The lack of a standard definition of “bariatric” and a definition that accounts for the size and shape of patients hampers inter-agency communication as well as equipment purchase. A more informative definition of “bariatric” needs to be agreed and promoted for use among those agencies that assist with the bariatric journey through the health care system.
- Further work is needed to quantify the frequency of bariatric patient movement within the emergency service, hospital and funeral sectors across Australia.
- Poor communication, lack of information, lack of standardisation of equipment and incompatibility of equipment between carer agencies in the bariatric journey leads to staff being exposed to increased risk of manual handling injury. An in-depth investigation of the interfaces between agencies is needed for the purposes of identifying obstacles to the improvement of patient and information flow.
- The limited interaction between agencies involved in the bariatric journey and the absence of a coordinated approach to manufacturers and suppliers of equipment creates a number of problems for purchasers, users and patients. A process for facilitating an inter-agency dialogue as well as a dialogue with equipment suppliers and manufacturers is needed. It is suggested that this may commence with an event during which an equipment exposition is a focus and agency workshops and seminars are facilitated. Representatives of ambulance, hospital and funeral services should be involved in this.
- Following such an event, agencies may collectively engage with local manufacturers of patient handling equipment to design *bariatric* equipment suited to the Australian environment and having the following features:
  - Design accounts for the range of shapes and sizes of bariatric patients;
  - Design accounts for load concentrations associated with variation in patient weight distribution;
  - Load limitations are tested using dynamic tests rather than static;

  - Design is sensitive to patients' concern for the aesthetics of equipment and stigmatisation that may be associated with its use;
  - Design incorporates the principles of Safe Design.
- Hospital and other care facilities have not generally been designed with the movement of bariatric patients in mind. It is suggested that processes are identified that will facilitate interaction between health care representatives and the Australia Institute of Architects. Such interactions should aim to make members increasingly informed about the complexities of bariatric care and sympathetic to the needs of health care institutions into the future. The application of Safe Design principles should be a focus for such interactions.
- Hospitals are relatively controlled environments while the home and cemetery are uncontrolled and semi-controlled respectively. While improvement in the design of the home with respect to bariatric patient issues has limited potential, it is suggested that cemetery trusts are made aware of the problems associated with the movement of deceased bariatric persons such that road and pathway design may be sympathetic to the needs of funeral directors in moving clients using wheeled equipment.
- Ambulance services and funeral directors share unique problems in the retrieval of bariatric people from the home environment. It is suggested that these services commence a dialogue regarding the sharing of ideas and innovations and the compatibility of equipment and procedures that will improve inter-agency interactions.
- Engagement with standards setting bodies such as Standards Australia is suggested regarding the merits of an Australian Standard for equipment design and manufacture and for the purchase, use and maintenance of bariatric equipment.
- Many agencies make equipment purchase decisions in isolation and are unaware of the full range of equipment that may be available and the experiences of others with that equipment. Establishment of a central repository of information regarding the pros and cons of bariatric equipment used in Australia would be beneficial.
- A number of agencies are developing purchasing policies and procedures and are documenting patient handling processes having the aim of minimising risk to staff although there is limited sharing of this information. Establishment of a central repository of information and exemplar policies and procedures would be beneficial.
- Most funeral businesses are small and lack the capital to invest in the equipment that is needed for bariatric patient transport. It is suggested that the feasibility of the operation of independently managed equipment pools in metropolitan and regional centres is explored.

- The numbers of bariatric patients moved in regional and rural areas is relatively small making the provision of specialised equipment more difficult for agencies to justify. It is recommended that processes that could be used to increase the accessibility to equipment by hospitals and ambulance services are explored.
- All carers involved in the bariatric journey have to make decisions regarding patient movement on the basis of the circumstances with which they are faced at any given point in time. As such, the ability to assess risk and make appropriate risk minimisation decisions is essential. Training and education in regard to bariatric patient movement varies widely among agencies and it is suggested that opportunities are created for the sharing of information and experiences regarding the training of staff in dynamic risk assessment.
- The patient's entry to the bariatric journey often commences with a referral from a general practitioner. It is suggested that agencies would benefit if general practitioners were informed regarding the importance of providing information about the size and weight of bariatric patients at the time of referral.
- In general there appears to be limited understanding of the entire bariatric journey among representatives of the individual agencies. A clear, perhaps pictorial, representation of the journey and the interfaces between the agencies and carers and their respective roles would assist with the understanding.

As a part of this project four case studies pertaining respectively to the movement of bariatric patients within and by ambulance and fire services, hospitals and funeral businesses have been prepared and are published as independent documents.

Introduction

Bariatric patients are morbidly obese persons accessing the health care system. There is an increasing awareness that carers of such people face risks during the transport and movement of those patients from home to the health care institution and then home again or, potentially to the mortuary and then funeral. However, there appears to be a lack of knowledge across the healthcare sector about how to safely manage their unique needs (Baptiste, 2007).

It appears to date that there has been no systematic investigation of these risks or counter measures in Australian workplaces. There are some references to programs within the literature but these are general in their nature. Within many workplaces where employees are required to move bariatric patients there are initiatives being introduced and these are underpinned by policy and documented procedures. There is a focus on the use of mechanical equipment but many of the initiatives are at a formative or pilot stage and any findings regarding their success are yet to be reviewed and added to an evidence base.

Therefore, surprisingly, given the emerging nature of these issues, there have been few concentrated attempts to draw together information or research relating to safe bariatric patient care. The purpose of this exploratory research project, funded by the ASCC, is to address the following research questions:

- What are the OHS risks associated with manual handling of bariatric patients to which workers such as nurses, ambulance officers, fire fighters, and those in the funeral industry in Australia are exposed?
- What measures (e.g. plans, policies, processes and equipment, supported by adequate training) have been introduced in Australia to reduce or eliminate the risks?
- How effective are the above measures?
- Where might further intervention be required to control the risk in Australian workplaces?

About the report

This report describes the project methodology and findings. Dispersed throughout the margins of the findings section are a series of *focuses*; these are vignettes designed to highlight various common issues within the four industries. They support the adjacent text and the attached case studies. They evolved from the stories that project participants told of their experiences with bariatric client movement.

Project Methodology

The project was exploratory and the methodology was in three parts; (i) literature review, (ii) focus groups and (iii) case studies. Research Ethics approval by the University of Ballarat Human Research Ethics Committee (HREC) was granted on 7th May, 2008 for the focus groups and on 30th May, 2008 for the case studies. Each of the three parts will be described in further detail below.

Literature Review

The purpose of the literature review was to identify the literature that may contribute to an understanding of the issues that carers face and the solutions that may be applied throughout the journey of bariatric patients in receiving health or funeral care.

A comprehensive search strategy was developed to identify the OHS issues that arise and the solutions that may be applied during bariatric patient care. Both refereed and non-refereed (specifically working papers and other available reports) materials were sought.

Firstly, a broad search was conducted on the internet through Google web and also Google scholar, and this search identified a range of publications, both refereed and non-refereed. The next stage of the search explored a range of electronic resources, beginning with the broadest searches through the Metalib database, followed by a review of the Database Hosts, EBSCO, Emerald, First Search, Informit, Springer, and Wiley InterScience. Each of the database hosts allow searches of many individual databases simultaneously. All the individual databases relating to health, medicine, OHS, psychology and sociology were selected for the searches. Some specific databases including JStor, Sage Journals, and InformaWorld were searched to confirm as many relevant materials as possible had been found.

Publications only available in printed form were reviewed by index for material relevant to bariatric patient handling. Finally, specific web searches of the research and publication pages of websites were conducted to locate information. In particular, websites of universities, graduate research organisations, general research organisations and associations, government departments concerned with healthcare, and nursing, funeral and emergency services associations in Australia, New Zealand, the UK and the USA were also searched.

The following search terms were used individually and also in various combinations including Boolean combinations:

bariatric, handling, transport, Australia, 'community care', 'emergency response', emergency service, fire, ambulance, funeral, hospital, 'aged care', mortuary, 'handling and transport in healthcare', patient client, obese, overweight, 'manual handling', movement, 'funeral industry', 'pre hospital care', 'bariatric care', rescue, 'fire fighting', 'fire fighter', paramedic, mortician, 'patient movement', lifting, transferring, musculoskeletal, corpse, cadaver, 'patient retrieval', 'bariatric patient', attendant, carer, orderly, 'personal care assistant', porter, equipment.

Focus Groups

Four focus groups were designed using a focus group methodology described by Krueger and Casey (2000). A question route was developed in accord with this methodology and is attached as appendix 1. The four groups were held in neutral locations (typically in hired meeting rooms) at the following locations between 16th May, 2008 and the 27th May, 2008:

- A large regional Victorian town
- An interstate capital city
- Central Melbourne
- A suburban region of Melbourne which straddled the rural and metropolitan boundaries

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.

Recruits were initially contacted by telephone and, after the project and the focus group methodology was explained to them, invited to participate. Consenting participants were sent a plain language statement and an informed consent declaration form as well as documentation detailing the research process. Signed consent forms were collected from all participants prior to commencement of each focus group.

All participants were invited to contribute to a discussion around the structured question route. One researcher led each focus group and wrote notes while the other researcher independently wrote notes regarding the dialogue. After the focus groups the two researchers aggregated their respective notes and collated them under one of four headings: *work environment; equipment; rules and procedures; training and education* (Borys, 2000). The outcomes of the focus groups are reported against these headings in the findings section below.

During each of the focus groups, the participants used stories when explaining examples of their experiences in moving and transporting bariatric people. These stories were collected and summarised and some of these are presented in the findings section, where they highlight particular aspects of the problems that are experienced or particular solutions or processes used by the different occupational groups.

Case Studies

An aim of the literature review and the focus group phases of the project was to collect material that would contribute to the creation of good practice case studies for handling and moving bariatric people.

One case study for each of the four industries (ambulance, fire, hospital and funeral) was prepared. The case studies expand on information collected during focus groups to detail different approaches being used by groups or organisations in each of the industries. While the aim was to collect case studies of good practice, it was, in the case of fire and funeral sectors, necessary to discuss issues and alternative approaches relating to the movement and transport of bariatric persons.

To develop the case studies some focus group participants were contacted at a later date and invited to contribute further material. Contributors were made aware that the case studies would be documented and made available to the general public via the internet. Each consenting contributor was sent a plain language statement and an informed consent declaration form as well as documentation detailing the research process. Signed informed consent forms were collected from all participants prior to beginning any site visits or interviews.

Each case study was written to cover areas indicated in the following guiding questions:

- What are the specific manual handling problems/risks?
- Why do these problems arise?
- What is the history of bariatric patient handling management both past and present?
- What is the particular hazard management approach being studied?
- What have been the approaches to implementing the hazard management approach?
- What evaluations have been conducted of the hazard management approach?
- What were the results of the evaluation?

Each of the completed case studies are published as independent documents.

Literature Review

Introduction

There is an increasing awareness of the risks that carers of bariatric patients face during the transport and movement of those patients from home to the health care institution and then home again or, potentially to the mortuary and then funeral. However, there appears to be a lack of knowledge across the healthcare sector about how to safely manage the unique needs of bariatric patients (Baptiste, 2007).

To date, knowledge arising from research into the risks and the measures introduced to counter these risks for Australian workers is also limited and, although there is literature that addresses some of the issues for health care workers, it is generally considered that in regard to patient handling, efforts to reduce injuries are often based on tradition and personal experience rather than scientific evidence (Nelson & Baptiste, 2006b).

Surprisingly, given the emerging nature of these issues, there have been few attempts to draw together research relating to safe bariatric patient care. Therefore, the purpose of this literature review was to identify and evaluate the literature that may contribute to an understanding of both the issues that carers face and the solutions that may be applied throughout the journey that bariatric patients take when receiving health care.

The need for a detailed literature review

Thomas & Rickabaugh (2008) propose that safe care of bariatric patients extends beyond the elements of mobility and equipment and becomes a institute-wide matter, with patients being seen in different units and departments and outpatient clinics. Vieira (in Baptiste, 2007) echoes these sentiments and suggest that with increasing numbers of bariatric patients presenting, the whole hospital needs to be prepared for them.

In recognition of the problems that present with the escalating numbers of bariatric patients, there is a growing body of literature that discusses the issues that affect carer health and safety. However, the literature has not been exhaustively searched and drawn together. Thus there is a limited evidence base on which to draw in regard to patient management and risk control. A detailed review of the literature as it relates to bariatric patient management and risk control is warranted.

A comment on the strength of the current evidence base

The body of literature uncovered during the literature search predominantly comprises evaluative reviews and experiential commentary on the problems associated with bariatric care. There is scant information in the peer-reviewed literature and too few publications dealing specifically with bariatric patient handling techniques and recommendations to assist with strategic management of these patients (Muir, Heese, McLean, Bodnar, & Rock, 2007).

The commentary on the problems associated with bariatric patient movement is rarely supported by reference to the literature. While some articles appear in academic journals, there is much information that appears in industry-based magazines that may or may not have peer-reviewed sections. This has both advantages and disadvantages. Advantages exist in terms of raising awareness among a wider audience. Disadvantages arise in that the bulk of knowledge has not come about through high quality qualitative or quantitative research.

The available literature originates almost exclusively in countries other than Australia and tends to focus on institutional care. There is little literature addressing pre-hospital care and emergency services response where relatively uncontrolled work environments are encountered. The literature is similarly limited in regard to aged care or post hospital management at the mortuary or funeral home. Furthermore, it offers little information concerning evaluation that may contribute to the evidence base (Baptiste, 2007; Muir et al., 2007). This is consistent with the views of Nelson and Baptiste (Nelson & Baptiste, 2006a) who suggest that efforts to reduce injuries associated with patient handling in general are often based on tradition and personal experience rather than scientific evidence.

Obesity: An emerging societal health problem

In 2003 the World Health Organization (WHO) reported that obesity had reached epidemic proportions globally, with more than 1 billion adults being overweight and at least 300 million of them clinically obese. It was pointed out that obesity is a major contributor to the global burden of chronic disease and disability. The phenomenon is being attributed to rising incomes, populations becoming more urban, and diets high in complex carbohydrates being replaced by more varied diets with a higher proportion of fats, saturated fats and sugars. At the same time, large shifts towards less physically demanding work have been observed worldwide. Moves towards less physical activity are also found in the increasing use of automated transport, technology in the home, and

more passive leisure pursuits. Areas of North America, the United Kingdom, Eastern Europe, the Middle East, the Pacific Islands, Australasia and China are particularly identified in regard to the obesity problem.

Fife et al (2007) report that the majority of U.S. states consider 20-24% of residents to be obese (i.e. 20% above ideal body weight) while Humphreys (2007) reports that two out of three adults in the US qualify as obese. Hignett et al (2007) report similar increases in the prevalence of obesity in England. Waist size trends among young people indicate that the use of BMI may be systematically underestimating the prevalence of obesity (Fife et al., 2007).

Rush (2002) reports that obesity in adults in the UK affects three times more people than it did 20 years ago and that two thirds of the adult male, and more than half of the adult female population are considered overweight or obese.

In Australia in 2004-05, some 41% of adult males and 25% of females were classified as overweight (Body Mass Index [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. In 1995, 38% of males and 21% of females were classified as overweight and 11% of males and 11% of females were classified as obese. For both males and females, increases have been recorded in both the overweight and obese groups across all age groups (Australian Bureau of Statistics, 2005).

In 2008 the Baker IDI Heart and Diabetes Institute reported (Stewart, Tikellis, Carrington, Walker, & O'Dea, 2008) that overall, almost 4 million adult Australians were currently obese and that among middle-aged Australians around 7 out of 10 men and 6 out of 10 women aged between 45 and 64 years were overweight or obese.

Exploring the meaning of ‘bariatric’

The term bariatric is used to describe patients who are morbidly obese. Rush (2002) has suggested that there is no consistency in what is considered “bariatric” although the body mass index (BMI) is accepted world-wide as the measurement of choice.

Morbid obesity has been variously defined, and is considered by some to be the point at which a person has a BMI of more than 30 (Humphreys, 2007; Nelson, 2006a). However, other authors report it to be the point at which a person has a BMI of more than 40 (Byard & Bellis, 2008; Fife et al., 2007; Green & Gillett, 1998). The World Health Organisation (WHO)

also categorise obesity in regard to BMI and use the following points as a guide: a BMI over 25 is defined as overweight, and a BMI of over 30 is considered obese (World Health Organization, 2003). 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 (Boatright, 2002).

Rush (2002 p5) suggests that an additional measurement used to indicate increased risk is waist measurement suggesting that this is a reasonable measurement of visceral adiposity independent of height. She states that a "waist circumference in excess of 102 cm carries a four-fold risk of cardiovascular disease development and is equal to having a BMI over 30. The greater the waist measurement the more abdominal fat will be present, further increasing health risks. Waist to hip ratio, and a waist circumference of greater than 40 inches in a male and 35 inches in a female, are also recognised measurements of obesity."

Significantly, Rush (2002 p5) points out, "…in every case clinical judgment must prevail, especially in such cases as athletes, who have greater muscle mass, elderly people, where body height diminishes due to ageing factors, or people with skeletal deformities."

The impact of rising obesity on the healthcare system

With obesity becoming a societal health problem of increasing prevalence around the world, the impact on healthcare systems is becoming evident. Morbidly obese patients are increasingly over represented in the use of healthcare services (Hignett et al., 2007), and Fife et al (2007) report that 75% of morbidly obese have at least one co-morbid condition which significantly increases their risk of premature death. Severely obese patients are six times more likely to have heart disease and ten times more likely to have diabetes and kidney failure. Muir et al (2007) report that up to 24% of bariatric surgery patients required admission to a critical care unit, and that non-surgical admissions to critical care units is increasing. Further, there is a high mortality rate for these patients because of the patients' delay in accessing treatment. The authors surmise that this delay may be in part due to there being limited capacity within institutions to manage care.

Stewart et al (2008) report that around 1.5 million middle-aged Australians are obese and therefore at high risk of a cardiovascular event in the longer-term. They suggest that, based on the best available evidence, obesity will result in an extra 700,000 cardiovascular disorder-related admissions in the next 20 years.

Byard & Bellis (2008) undertook a review of two coronial autopsy populations aged more than 16 years between 1986 and 2006 in Adelaide, South Australia. The study found that there had been a marked increase in the number of obese individuals undergoing coronial post mortem examinations in South Australia over the past 21 years.

WorkCover New South Wales (NSW) (2006) identifies that hospitals, nursing homes and community health services increasingly admit bariatric patients and offer the example of the Manning Base Hospital as shown in Table 1.

Table 1 Bariatric patient admissions at the Manning Base Hospital 2000-2004 (WorkCover NSW, 2006)

Year	Number of bariatric patients
2000	20
2001	37
2002	49
2003	101
2004	194

From an occupational health and safety point of view, the impact of increasing numbers of bariatric patients is particularly acute on those associated with patient handling. Hignett et al (2007) have 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.

Bariatric patients generally have limited mobility and decreased lung capacity, owing to the weight of the chest wall that reduces their ability to assist in movement (Fife et al., 2007). Therefore, there are special demands placed upon carers throughout this journey with regard to patient lifting and movement (Humphreys, 2007). The risk of injury to carers is increased because care givers may be responding reactively, increasing the risk of sustaining musculo-skeletal injury (Gallagher, 2005b; Hignett et al., 2007; Nelson & Baptiste, 2006b) and increasingly bariatric patients are exceeding the weight limits of the various hoists and slings that may be used for moving non-obese patients (Collins, 2004).

Byard & Bellis (2008) report that obese cadavers present problems other than handling their weight, as large body masses enhance putrefactive processes and bodies become slippery, exacerbating handling problems.

The impact of rising obesity on the health and safety of carers

The manual handling risks faced by health care staff have long been widely recognised (see for example Nelson, 2006b; Retsas & Pinikahana, 2000). With bariatric patients these risks are compounded by the complications that are associated with weight, shape, mobility and cooperation. Other factors associated with the bariatric patient's clinical condition and the treatments required include levels of comfort or pain, the need for privacy, and concern for dignity. All of these factors can potentially increase the manual handling risk to carers (Bachman, 2008; Baptiste, 2007; Hignett et al., 2007; Humphreys, 2007; Pellatt, 2005) and can result in carers tending to put patient safety ahead of their own (Baptiste, 2007).

In one of the few articles dealing with the problems faced by mortuary staff, Byard & Bellis (2008) identify that lifting or transferring bariatric bodies increases the risk of back injury, and that handling of the deceased often lacks dignity due to the great difficulties that arise in physically positioning these bodies. The authors state, "Pathologists and technicians often have difficulty in performing autopsy dissections, as opening body cavities that are encased in many centimetres of adipose tissue is technically difficult and sometimes not possible on standard trolleys or tables. Autopsies have been performed on floors, or with a pathologist leaning from a ladder, or actually standing on the trolley over a body. Moving bodies from one trolley to another, as may be required in some mortuaries, is a potentially dangerous activity with the possibility of injury to staff that are lifting excessive weights. There is always the danger of dropping the body." (Byard & Bellis, 2008 p3).

The OHS challenges of bariatric patient care

The challenges associated with bariatric care usually begin with the movement of a patient from their home to the hospital, but may also present with transport directly from home to the mortuary. Boatright (2002) reports that most ambulance companies in the US have experience of moving patients weighing 500-800lb (227-363kg) and that typically 50% of compensable injuries among personnel are related to patient handling. There are generally fewer people available to help in the home than there might be at a hospital.

Grant and Newcombe (2004) observe that in NSW, pre-hospital and inter-hospital transport of bariatric patients presents a number of logistical difficulties. These include stretcher dimensions and strength as well as stability. Specially designed heavy duty stretchers and vehicles are being introduced but their availability is often limited and access to dwellings is sometimes limited by the size of the vehicle. Assistance from other emergency services such as police and fire brigade is sometimes necessary. The authors also report problems on arrival at the hospital where suitable beds may not be available.

In the ambulance in the event of an emergency, as well as at the hospital, the need to use alternative clinical practices or the limitations imposed on standard clinical practices may expose carers to increased risk (Grant & Newcombe, 2004). For example, the need to support body tissue or limbs while bariatric patients undergo procedures, turning and repositioning a bariatric patient in bed, and transferring patients in and out of bed, are all situations that place demands on carers that are different to those experienced with non-obese patients (Baptiste, 2007). Rose et al (2007) suggest that the average number of staff required to assist morbidly obese patients walk is 2.4 greater than for non-obese patients.

Despite there being few other references to the impact of bariatric patient movement on emergency services personnel, the March 2008 draft National Occupational Research Agenda (NORA) National Public Safety Sub-sector agenda for Occupational Safety and Health Research and Practice in the US proposes a specific strategic goal to “Reduce traumatic injuries among EMS [Emergency Medical Services] personnel that occur during movement of patients and equipment by 30% by 2012” (NORA Public Safety Sub Council, 2008 p 24). They propose a research goal to “By 2010, evaluate low friction, bariatric patient transfer and vertical lift and descent technologies and provide recommendations for further developments” (ibid p 24).

Whipple (2008) describes the establishment of a bariatric patient care task force comprising representatives from the US Association of Rehabilitation nursing, American Physical Therapy Association and the

Veteran's administration/Patient Safety Centre having the goal of minimising injuries while maximising rehabilitation of patients. The task force recommends the implementation of OHSA guidelines for nursing homes; building a culture of safety in rehabilitation settings that protects staff as well as patients; improving communications between nurses and physical therapists to facilitate safe patient handling and movement; developing policies and procedures for the therapeutic use of patient handling equipment; conducting competency based assessments for staff who use patient handling equipment; and encouraging research that supports improvement of patient and staff safety.

Environment related challenges to safe patient care

The environments within which carers work with bariatric patients have a significant impact on the risk of manual handling injury. A number of authors (see for example Hignett et al., 2007; Lipperman & Preira, 2002; Thomas & Rickabaugh, 2008) comment on the design of facilities. Of course the design of the patient's home is outside the control of the pre-hospital carer and room size, corridor width, stair width, gradient and safe working loads can limit the use of equipment and present considerable manual handling problems (Hignett et al., 2007).

In a survey of health trusts in the UK, Hignett et al (2007) found that 38% of acute and primary care trust respondents suggested that there were parts of the building they use, essential to patient care, which could not be accessed by bariatric patients. Space is identified as being important along with clearance (for doors, stairs and corridors), load capacity of floors and floor surface.

Lipperman and Preira (2002) reported the use of an architect to determine the suitability of the rooms for bariatric patient care within their nursing and rehabilitation centre in the US. Thomas (2008) described the design in 2000 of a new bariatric surgery facility in Carolina that identified the need for larger patient rooms, floor-mounted toilets, ceiling lifts and wider door ways. However, budget restrictions led to the construction of the facility with only larger doorways and five larger rooms and by 2005 when the unit opened, many of the building features were found to be inadequate owing to there being a 100% increase in bariatric patients during the intervening period.

Thomas (2008) discussed the admission to the Carolina institute of a 400lb (180kg) patient that raised concern about the load capacity of the floor given the need for attendance by extra care givers and heavier equipment. A structural assessment led to the development of a floor grid that indicated the weight limits of the patient, bed and care givers within a 1.8 x 1.8m area. If assessments indicate that weight limits may

be exceeded, patients are transferred to more structurally sound sections of the hospital.

Equipment-related challenges to safe patient care

Baptiste (2007) identified the rise in the number of upper body injuries, in particular shoulder and neck, sustained by carers in one USA institution as a result of handling obese patients without using equipment. Jung (2004) stated that those health care institutions that do not have suitable equipment risk injuring personnel.

The difficulties of retrieval from the home by ambulance and the limitations of standard ambulances given the dimensions of patients have been reported (Boatright, 2002). The same author described one case in the USA in which a patient weighing more than 1000lb (450kg) had to be moved from the third floor of a dwelling using a crane and then transported via a flat bed truck. Hignett et al (2007) referred to a similar situation requiring the extrication of a patient through a window using a cherry picker. The same authors found that among ambulance trusts surveyed in the UK, 89% used fire service assistance with the extrication of and transportation of bariatric patients, but 56% indicated that this was only under emergency circumstances.

Ambulance design can contribute to manual handling risk in a number of ways through limitations on paramedic movement. The load capacity of the vehicle may also influence the positioning of stretchers and the loading system employed.

Hignett et al (2007) found that 61% of ambulance trusts surveyed in the UK had specialised bariatric equipment. This equipment was mostly stored at the ambulance station or on bariatric ambulances. Thirty-nine percent (39%) of ambulance trusts surveyed reported that they operated specialised bariatric ambulances.

Most hospital equipment is not designed for patients over 300kg (Pellatt, 2005). Muir et al (2007) cite a survey of the Canadian University Health System Consortium that found that 39% of reported accidents or equipment related problems were associated with bariatric patients. The same survey found that 55% of nursing personnel report injury claims relating to providing patient care. Interestingly, patients themselves report claims, 18% of which related to equipment inadequacies.

In regard to deceased bariatric patients, Byard and Bellis (2008) identify that mortuaries were generally designed to deal with bodies of normal size. The authors report that morbidly obese individuals often do not fit into standard refrigeration bays and they are often difficult to move onto trolleys designed for bodies with normal BMIs.

Hignett et al (2007) found that 77% of acute and primary care trusts in the UK had specialised bariatric equipment. The equipment was least likely to be available in theatre and x-ray departments and sometimes there was conflict between clinical equipment and the use of equipment for patient handling. The same authors refer to the structural difficulties associated with the mounting ceiling hoists in operating theatres.

Standard clinical equipment is often inadequate for bariatric care. Singh et al (2007) assessed the perceptions of emergency department staff and patients at a hospital in Canada in regard to the adequacy of bariatric patient equipment and found that satisfaction with equipment was inversely related to increasing patient size. Hignett et al (2007) offer examples in regard to limb support and design of tables that account for weight and support of excess flesh.

The US bariatric patient rehabilitation task force has recommended the increased use of equipment for patient handling (Whipple, 2008). However, not all equipment suits all shapes and sizes of patients. Patients are best served when equipment is selected to suit their size and shape (Gallagher, 2005a). Rush (2005) offered four categories into which bariatric patients generally fall. These are:

- Anasarca, where the patient presents with severe generalised oedema;
- Apple, being apple ascites weight distribution where a patient carries weight high and has a rigid abdomen or apple pannus weight distribution where a patient carries weight high and the abdomen is mobile and hangs to the floor (an apron);
- Pear, being pear abducted where the patient carries weight below the waist and has significant tissue between the knees or pear adducted where the patient carries weight below the waist and has tissue bulk on the outside of the thighs; and
- Bulbous gluteal region where the person has excessive buttock tissue creating a protruding shelf.

Further to consideration of patient size, shape and weight distribution, equipment selection involves consideration of the degree of mobility and muscle strength, knowledge and skill of carer, and factors associated with the surrounding environment (Bakewell, 2007).

Several authors comment on barriers to the use of equipment for bariatric patient movement (Baptiste, 2007; Hignett et al., 2007; Nelson & Baptiste, 2004; Rush, 2004; Whipple, 2008). These generally fall into three categories associated with the equipment, the carer and the patient. In regard to the equipment; 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 are cited. In regard to the carer; lack of training; lack of staff awareness; a perception that equipment is cumbersome or otherwise inconvenient; inability to locate the equipment; and time constraints are cited. In regard to the patient; aversion to the equipment; loss of a sense of control; feelings of insecurity; and discomfort are cited.

Unconscious stigmatisation by carers can reduce a patient's willingness to accept use of equipment (Berger, 2007). It is interesting to note that in many cases when patients have claimed that their human rights and dignity have been compromised during care, hoists have been involved (Pellatt, 2005).

Despite the barriers identified in regard to carer use of equipment, when surveyed as a part of a comparison study rather than general perceptions, nurses in the USA consistently reported that use of a mechanical device was preferable (Whipple, 2008). Rickett et al (2006) assessed social-cognitive determinants of hoist usage among health care workers in the USA and concluded that efforts to increase motivation to use hoists should directly address motivational beliefs within the culture of the hospital. In particular, the messages should emphasise that failure to use a hoist may result in adverse social or physical consequences and that enhancing the perception that using the hoist is encouraged by co-workers may be valuable. Pellatt (2005) supports this and suggests that nurses need to be aware of the prevailing culture in their clinical area. However, key motivational determinants in equipment use are associated with the availability of hoists (Whipple, 2008).

Some institutions in NSW have an equipment pool and when an obese patient is admitted, the equipment is brought to the hospital. However, there are obvious limitations to this due to increasing admissions and the distance between institutions (WorkCover NSW, 2006) and thus equipment may not be readily available at the time of need. Bahlman (2005) described a computer based, infra red equipment tracking system within an institution in the US that enables rapid and easy access to equipment when it is needed.

Leffard (in Baptiste, 2007) described the process of cohorting of bariatric patients (i.e. location in one area of the hospital) at an institution in the USA, for reasons of equipment access and staff expertise. Anecdotally, Leffard (ibid.) reported on carer injuries in a bariatric unit of a US medical centre. In 2004, 3.5% of the total injuries for hospital were experienced within the bariatric unit and after a range of interventions to reduce manual handling by carers the proportion of injuries in 2005 had fallen to 1.3% of the total (Baptiste, 2007).

Following their analysis of two coronial autopsy populations in South Australia, Byard and Bellis (2008) concluded that mortuaries need to be

modified to deal with the increasing numbers of morbidly obese cadavers and appropriately equipped to reduce the risk to staff.

In their discussion of safe lifting and movement of patients in nursing homes in the US, Collins et al (2006) reported that cost benefit analyses demonstrate that the initial investment in lifting equipment and training can be recovered in two to three years.

Procedure related challenges to safe patient care

The UK Health and Safety Commission (Pellatt, 2005) noted that standard protocols and equipment may not be able to cope with bariatric patients. The Commission suggests that all hospital trusts should have a bariatric protocol that covers the availability of equipment and safe handling procedures for all foreseeable circumstances, including patient falls and death.

Nelson and Baptiste (2004) offered an example of a policy for hospitals and nursing homes and suggested that it contain a statement of purpose to prevent musculoskeletal injuries (Baptiste, 2007). It should also detail the responsibilities of staff such as the administrator (implementation, provision of equipment and training, resources and evaluation of the safe lifting program), unit nurse manager (assessing patients needs), nurse supervisors (ensuring staff are trained, ensuring use of correct procedures and use of equipment), nurses and frontline care givers (using program policies and procedures, reporting incidents and needs for equipment maintenance etc), and maintenance personnel (inspecting and repairing equipment, etc; processes for patient assessment). It may also contain processes for assessing the suitability of the workplace for care and use of the necessary equipment and training requirements. Muir et al (2007) propose the use of bariatric patient policies and handling procedures, patient assessments and the use of patient handling algorithms (a set of detailed instructions specifying how to solve a problem), training and education and an equipment pool.

Hignett et al (2007) found that 42% of surveyed institutions in the UK had a policy for bariatric patients, although 28% reported that their organisations did not adhere to this policy very well. Barriers to policy success were reported as staff not reading it, lack of resources or equipment, not all areas allocating importance to the policy, lack of management support, and staff not seeing the matter as a priority.

WorkCover NSW (2006) pointed out that it is difficult to predict when an obese patient may be admitted and therefore it is important to have a plan that details the protocols for patient management and access to equipment. It is suggested that identification of the obese patient prior to admission is important and that this may involve the ambulance service.

Admission personnel should be alerted and appropriate equipment prepared.

Gallagher et al (2007) described the establishment of a hospital-wide bariatric committee having the aim of educating staff, fostering cultural change, identifying equipment needs, and developing policy and protocols. Some hospitals in the US have patient safety centres (Baptiste, 2007) and promote the use of these by nurses for ergonomic assessment rather than trying to resolve difficulties alone.

A number of authors place a heavy emphasis on patient assessments as the basis for risk reduction. These assessments enable the planning of the patient journey and the use of the appropriate equipment and personnel. In regard to emergency management of the morbidly obese, Grant and Newcombe (2004) emphasise the importance of physical assessment and communications. However, emergency services often receive limited information about the patients before arrival. Hignett et al (2007) explored the communication between ambulance control centres, paramedics and hospitals in the UK and found that for emergency calls, 94.4% of respondents reported occasions when ambulance staff did not discover that the patient was bariatric until arrival at the call site. For non-emergency calls, 27.8% of respondents reported that information about the patient's weight and size was provided before the crew was dispatched.

Patient assessment prior to arrival of the ambulance at the patient's home and the ambulance at the hospital enables a walk test mobility assessment and thus the development of plans regarding equipment needs (Baptiste, 2007). Generally patients are assessed as either independent, partially independent or dependent.

WorkCover NSW (2006) reported the success of the Manning Base Hospital in Taree, NSW where a management plan for patients in excess of 150kg has been instigated. The ambulance service now notifies the emergency department of bariatric patients prior to arrival. Admitting personnel assess the patients and destination wards are advised in advance. A *Red Dot Visible Mobility System* (Wood, 2005) is activated, where the number of dots displayed on a slide plate above the bariatric patient's bed indicates their level of mobility. The successful red dot system has been emulated across Australia and internationally.

In the UK Hignett et al (2007) found that only 40% of surveyed acute and primary care trusts reported that manual handling risk assessments were undertaken for bariatric patients at admission and discharge. However, 84% of ambulance trusts reported that risk assessments were undertaken for bariatric patients at admission and discharge and 89% of these communicated the information to hospitals prior to arrival.

Baptiste (2007) reported a bariatric patient handling toolkit available in the USA that included assessment criteria to assist carers in planning the safe handling and movement of bariatric patients. These are captured in a series of algorithms that are designed to assist carers in selecting equipment and movement techniques for specific circumstances and tasks.

Algorithms standardise practice based on most current evidence, rather than each carer relying on their own training and experience. Building on patient assessment criteria, algorithms are used as guides when planning high-risk handling tasks (Nelson, 2006b). Thomas (2008) reported the integration of algorithms into an electronic tracking system at a hospital in the USA. The system employs the institute's electronic medical records that identify patients that exceed 300lbs (136kg) and precipitates recommendations that reflect needs in regard to equipment, the employment of lift teams, and patient mobility and the provision of information to all departments prior to transfer. Green & Gillett, (1998); and Hurst, Blanco, Boyle, Douglass, & Wikas, (2004) comment that arrangements for transfer to the mortuary should be included in such systems.

Rush (2002) proposes a systems approach to bariatric care as illustrated in Figure 1 and suggests that a risk assessment in regard to carer health and safety should include consideration of an in-depth handling plan (e.g. do not move the person on the hoist, move the equipment to the patient); the weight of the patient and their mobility and capability; the patient's psychological needs; the number of persons required to undertake the care; tissue viability; pain; accessibility of the environment; environment space for manoeuvrability of equipment and health providers; equipment in place including mattress type (e.g. foam or dynamic); bed design; equipment required; personal care; attachments (e.g. drips, catheters); types of transfers required; therapeutic handling; sling assessment (if required); bariatric equipment resource centre; and training needs.

(taken from Rush, 2002)

Figure 1 Bariatric patient centred care pathway

Lifting teams are promoted by a number of authors (see for example Bachman, 2008; Baptiste, 2007). These teams generally employ a combination of manual and mechanical lifts. Leffard (in Baptiste, 2007) described a team that has a minimum of 2 people and up to 4 and is available within 10-15 minutes of the need being identified. The team undertakes approximately 700 lifts per week with reported low injury incidence. However, the team comprises outside contractors, and there has been some concern expressed about transference of risk (Baptiste, 2007). In Australia, lifting teams are not encouraged and are contrary to the principles of injury prevention generally adopted in health care and promoted through “No Lifting” policies.

Training-related challenges to safe patient care

Many authors refer to the need for training in lifting techniques as well as use of equipment. Baptiste (2007) promoted the appointment of a bariatric resource person who can coordinate the supply of appropriate technology, conduct equipment trials and coordinate training of staff. WorkCover NSW (2006) referred to the need to include in training the volunteers and relatives who may be involved in patient movement.

Pellatt (2005) examined the interrelationships of patient and staff dignity and safety during patient handling in the USA. She cited the work of

others who suggest that the use of hoists should not be synonymous with loss of dignity and that skills in equipment use are very important to maintaining a sense of well being. She pointed out that respect for dignity should not be limited to concern for the patient and that requiring nurses to be put at risk compromises their dignity; patient and nurse dignity should not be competing rights. Therefore training and education should address this and go beyond safe operation of equipment to include understandings of the interactions between the handler and the person being handled within a human framework. Berger (2007) pointed out that unconscious stigmatisation by carers can reduce a patient's willingness to accept use of equipment and therefore training regarding sensitivities is important.

There are a number of barriers to the application of training. Sometimes there is not enough time to plan or use the training provided, especially in an emergency situation (Baptiste, 2007). Hignett et al (2007) found that over 35% of health trusts in the UK provided no extra manual handling training in regard to bariatric patients.

Clearly training alone is not enough to protect staff and 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 (Baptiste, 2007; Whipple, 2008).

The organisational environment and management approach to risk control

Fit-for-purpose equipment, well designed physical environments, suitable rules and procedures, and competent and knowledgeable employees are dependent upon a suitable organisational environment or organisational safety culture and management approach (Borys, 2000). Therefore, in terms of bariatric patient handling, questions can be asked about an organisation's recognition of bariatric patient needs as an emerging problem. Further, whether the interfaces between the different parts of the bariatric patient journey are considered as part of the risk control system, whether purchasing decisions regarding the selection and implementation of equipment consider the needs of the staff, and so forth.

In terms of researching the organisational environment and management approach and its influence on equipment, environment, procedures and training, the literature does not appear to exist. Therefore, advice regarding an organisation's general and OHS management system in relation to bariatric care is lacking.

Opportunities for evidence-based bariatric patient care risk reduction: Directions for the future

Research typically makes a contribution to four areas of activity within any discipline: practice, education, research and administration (regulation and policy development) (Fawcett, 2005).

In terms of the current study the contribution that the current evidence base regarding bariatric patients makes to each area of activity can be assessed. Table 2 takes each one of these areas and summarises the information available to inform activity in that area.

Table 2 The potential contribution of practice, education, research and administration to the evidence base pertaining to bariatric patient handling

Area of activity	Information that can inform the area of activity
Practice	The bulk of the information looks at researchers and health care personnel and their experiences in the form of commentary. Apart from some literature reviews, few pieces of work cover case studies or intervention evaluations. Much of the commentary is also a review of experience containing some valuable thoughts and suggestions. The commentaries however are not often backed up by any reference to the wider literature.
Education	Education refers to the education of current and future nurses, paramedics, OHS professionals etc. This area specific to bariatric patients is not really addressed in the literature.
Research	There is limited robust research in the area of movement, transport and care of bariatric patients which evaluates equipment or methods of handling or indeed any interventions aimed at reducing the risk of manual handling problems among staff.
Administration/policy development	The main outcome desired in this area is the raising of awareness of the issues that arise for staff in different healthcare industries associated with the movement, transport and care of bariatric patients and the bariatric deceased.

Conclusion

It appears that to date there has been no systematic investigation of the manual handling risks or of the measures introduced to counter the risks

associated with the care, treatment and transportation of bariatric patients and clients in Australia. However, there is an emerging awareness that the number of bariatric patients presenting within health care systems is increasing and this is exposing carers to increased risk of manual handling injury. Carers are exposed to risk throughout the journey that bariatric patients take within the healthcare and funeral systems. However, the literature focuses almost exclusively on the hospital and health care institutional setting. There are minimal references to pre-hospital care and no references in the literature to management at the mortuary or funeral home.

Various authors discuss the suitability and limitations of the environments within which carers of bariatric patients work, the equipment they use, and the procedures and training offered to support them. However, there is no discussion of the organisational OHS management systems within which these are set.

It is clear that further work is necessary to develop and then evaluate interventions within the health care continuum.

Focus Group Findings

Ambulance: Organisational and work environment issues

Work environment

Ambulance officers and paramedics work in uncontrolled environments. In regard to bariatric patient handling, those environments are generally residential dwellings. Ambulance service representatives made the point that such environments are designed for ambulant people and that movement of any person who is not ambulant is complex and challenging in regard to control of risk to staff. The complexities associated with the movement of bariatric patients further increases the risk.

Ambulance service representatives reported the removal of door frames to move bariatric patients. Other factors that limit patient movement are narrow corridors, stairs, furniture and the patient's effects. 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 available.

Accessing properties presents difficulties. Ideally the vehicle will be positioned as close to the dwelling as possible but 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

Ambulance representatives reported the use of furniture vans in the past to move patients that were too large to be transported by ambulance. The South Australian, New South Wales and Melbourne Ambulance services currently have dedicated and equipped bariatric transport vehicles.

Not only are vehicle capacities limited, but also equipment such as stretchers have

Focus:

Bariatric patient movement in hospitals

A patient whose weight was in excess of 300kg arrived at the hospital in a van. With assistance the patient was able to move to a bariatric wheelchair. The purchase of a bariatric bed was rapidly arranged and this enabled better management of pressure-related issues.

The patient was 1220mm wide at the shoulders. There were limitations on the path the patient may take through the hospital to avoid the limitations of door sizes. To preserve dignity, movement of the patient around the hospital was limited to times when few other patients or visitors were present.

The patient died in hospital. As with many bariatric patients, he slept in a seated position in bed to prevent undue pressure on the lungs associated with chest weight. Post mortem rigidity of the hips made movement problematic. The bed was used to move the patient towards the mortuary but progress was limited by the size of doorway openings. To progress the journey, two trolleys were strapped together and the patient was positioned on these on his side. A tug was used to move the trolleys with 6 staff on each side. A large amount of manual lifting was required during transfers and to manage issues with the load limitations and stability of the trolleys.

limited capacity and the combined weight of the stretcher and the patient may exceed the capacity of restraints in the vehicle in the event of sudden deceleration.

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

Representatives of one service reported that it has 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 prevent the use of equipment in patient movement.

Inconsistencies in equipment across borders can limit successful patient movement.

Rules and procedures

Generally, patient weight is unknown at the time that a call to the ambulance service is received. Representatives of one service reported that 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.

One focus group attendee reported that it is relatively common for ambulance crews to be called to health care institutions to move patients where staff are governed by a "no lifting" policy. At some domestic locations fire services are called upon to assist with patient movement although this is not preferred and a view was expressed that the use of fire services can negatively impact on patient dignity. 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.

It is understood that one service is compiling a list of hospitals that are equipped for bariatric patient handling such that crews may be appropriately directed with patients requiring specialised assistance.

Training and Education

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 use mean that experience is limited.

Hospital: Organisational and work environment issues

Work environment

The focus groups confirmed much that was found through the literature review. Building design and structural limitations emerged as a major problem in this sector. While it was reported that architects are increasingly responsive and that there are more frequent discussions of such matters at health care conferences, institutions are operating within the constraints of the buildings currently occupied. These constraints range from narrow fire door and elevator openings to load limitations on roof trusses such that the installation of overhead hoists for bariatric patient movement is prohibited. Factors such as the need for infection control and the sealing of mortuaries can limit the installation of

equipment such as ceiling-mounted monorails that might otherwise be continuous between rooms.

Movement of patients within the hospital environment emerged as a significant issue, especially where movement between buildings is required to access different treatments; at one institution, movement across a road is necessary. In older hospitals where new additions are progressively made, there may be differences in floor heights and inter-connecting ramps become necessary. Within buildings, floor coverings can present problems in regard to wheeled equipment. Commonwealth legislation requires institutions to be home-like and thus carpets are commonly used. Some carpets have a directional weave and present resistance to the pushing of trolleys and beds.

To limit patient movement, it has been reported that some US institutions are cohorting patients (i.e. location restricted to one area of the hospital). Reports in Australia suggest that there are benefits to moving away from dedicated bariatric suites. The equipping of multifunction wards (e.g. 4 bed wards) with at least one bed equipped to manage a bariatric patient means that the extra workload associated with bariatric care can be shared among staff.

Specific design issues were raised in relation to the size of emergency room cubicles that limit the emergency treatment of bariatric patients in a sensitive manner. Toileting of bariatric patients is a major problem and the design of the toilet pan was a recurring issue; many hospital toilets are wall mounted and have a load limit of approximately 130kg. Breakage of toilet pans by obese patients is not uncommon.

One hospital reported that they were not equipped to manage the post mortem of patients having a BMI>30 and such cases were transported to a facility in a large metropolitan centre.

Equipment

The availability of bariatric patient handling equipment is limited within health care institutions. In regional centres the problem of access to equipment is acute and leads to bariatric patients being transferred to larger centres and cities for treatment. This imposes a load upon patient transport services as well as distancing the patient from the family.

Not only are there a limited number of suppliers of bariatric patient handling equipment in Australia but also information about the range of equipment and the pros and cons of individual items is limited. Much of the bariatric handling equipment available is manufactured and supplied from the USA and the load ratings are provided in imperial units. It was suggested that there would be a benefit in the establishment of a central

repository of information about the equipment offering information about its use in the Australian work environment.

Within institutions the availability of equipment can be problematic. With limited budgets for equipment purchase, and the co-morbidity of patients presenting, some institutions have established equipment pools. However, this equipment has to be accessed when and where needed and on occasions it is lost with patients for extended periods when they are moved to other facilities or to the mortuary. One hospital reported reactive purchase of some equipment to assist with the management of a particular patient. Such purchases provide a rapid solution to patient care issues but may not facilitate appropriate consideration of issues relating to compatibility with the built environment.

A number of limitations associated with equipment design were reported. A recurring theme related to the equipment being designed on the basis of patient weight, typically accommodating a maximum of around[3] 230kg. While this rating limits the use of equipment there is often uncertainty regarding patient weight and the incorporation of scales into equipment was suggested as potentially useful. There are disadvantages associated with this in regard to increasing the overall weight and handling problems of the equipment.

[3] A comment was made that where load ratings are listed by suppliers in metric units, they are often rounded to apparently arbitrary numbers as a result of the conversion from imperial weights (pounds).

Of greater concern was that equipment is designed to accommodate heavy patients and ignores the issue of size and shape. The point was made that bariatric patients often tend towards a square shape while equipment is designed for rectangular shapes. The load ratings on trolleys are based on a static load distributed across the device whereas bariatric patient load is mobile and often spreads beyond the perimeter of the equipment. This can lead to issues with the centre of gravity on the equipment being outside the designer's expectations and reports of trolleys over-balancing were received. One hospital reported the use of spreader bars with lifting equipment such that the load may be distributed more appropriately. The problem of over-balancing of equipment may be further compounded when carers reach over or even stand on the edges of equipment to tend to a patient.

Hospital environments limit equipment use and hospital equipment can be unsuitable for bariatric patients. Door widths can limit movement of large trolleys from one area to another and mortuary fridge openings are generally limited to approximately 400mm. Theatre equipment is rarely suitable for bariatric patient procedures and it may be necessary to use multiples of staff to move and support limbs and strap limbs to tables to prevent movement of the body during surgery.

Items as minor as gowns can impact on patient mobility. Hospital gowns are generally too small for bariatric patients and thus discourage independent mobility. Patients would prefer to be more discreetly moved on equipment that preserves some modesty.

Simply moving patients on equipment can expose the carer to risk. An example was provided of a bariatric wheelchair that can accommodate a 300kg patient but is extremely difficult to push simply because of the total weight. The movement of the wheelchair is also limited by door widths. Reports were made of problems with floor coverings with single castors on equipment becoming stuck in grooves and elevator doorways.

The appearance of equipment, its acceptability to patients and concern for patient dignity arose repeatedly as issues. It was reported that bariatric equipment often has an "industrial appearance" and that more thoughtful design could make its use more acceptable to patients. One hospital proposed the installation of continuous ceiling-mounted monorails to assist with patient movement throughout wards. The proposal was rejected by hospital management and monorail installation was limited to within-room fittings on the grounds that patient dignity would be compromised by suspension from the ceilings as they were moved around the facility. The resultant monorail permits movement from bed to shower and toilet only. Where it is in use the hospital reported a substantial reduction in manual handling related workers compensation claims.

It was reported that the manner in which the equipment is presented to the patient can increase acceptance. At one hospital, carers are encouraged to present the equipment as that which will make the patient comfortable during movement rather than that which will make the carer able to better cope.

Having facilities for managing bariatric patients can lead to referrals from unequipped institutions, thus increasing the exposure of staff to handling risks.

Rules and procedures

The absence of a consistent definition of “bariatric patient” can limit the efficacy of procedures. For example one hospital undertakes pre-admission assessments of patients having a BMI>30 while another uses BMI>40 as the trigger. A confounding problem is reportedly that bariatric patients will commonly misinform carers about their weight to avoid anticipated discrimination.

Hospitals reported varying degrees of advanced warning about the admission of bariatric patients. It appears that general practitioners will rarely consider the provision of advice regarding weight and size when referring a patient. It is common that a patient being moved from home has not been weighed for some time. Ambulance services sometimes provide advice and if a specialised transport vehicle is being employed pre-admission advice is very likely. It was reported that providers of services external to the hospital (e.g. rehabilitation providers) are rarely advised of patient weight and size at the time of referral.

The difficulties with definitions can impact on resources. In the absence of clear definitions of bariatric patients, the employment of robust purchasing policies is limited. Also in a case-mix funding model there is no acknowledgement of the increased costs associated with bariatric care. One hospital reported that the provision of care for a bariatric patient over a 37 day period cost 17 times more than the equivalent care for a non-obese patient. The increased costs were generally associated with the additional staff required to provide care. Other less tangible costs are associated with the reduced availability and timeliness of response to other patients as a result of numbers of carers being occupied with a bariatric patient. Carers may not rapidly move directly to another patient for reasons of infection control.

Procedures are generally written for equipment usage but concern for patient dignity can influence their application. For example, movement of patients within the hospital may be reserved for a time when there are fewer people such as visitors or other patients present in communal areas. It is common to avoid the need for equipment by limiting patient movement. For example, carers may opt to provide the patient with a

bed bath rather than risk a collapse in an ensuite although this may require a greater number of attendants to lift limbs, support tissue, etc.

Training and Education

Training in bariatric care, including equipment use, was seen as essential in the health care setting. However, problems can arise with unfamiliarity as a result of rarity of use as well as high staff turnover and the employment of agency staff.

The ability of carers to assess risk in a dynamic environment was seen as important such that appropriate decisions are made to control risk at the time of patient handling in a range of environments and circumstances. It was reported that training should address issues to do with patient resistance to movement. Such resistance may arise as a result of pain or concerns about dignity. It was suggested that carers may allow patient dignity to influence their acceptance of risk, and even when dealing with a deceased, use techniques that may be hazardous.

Funeral: Organisational and work environment issues

There are around 134,000 deaths in Australia each year. Among the deceased are increasing numbers of obese persons, resulting in funeral directors being exposed to manual handling risks during collection, transport, preparation, funeral service and burial.

Funeral directors operate at several points within the bariatric journey; at the home of the bariatric deceased, at the nursing home or hospital where they died, or during the transfer from those locations to the funeral home. At the funeral director's mortuary, preparation of the remains for funeral and burial is completed before the journey resumes with the movement into the funeral director's chapel or a church for a funeral service, the crematorium for a cremation service or the grave for a grave side service. Following the service the burial or cremation processes are undertaken.

Some funeral directors may also be involved in the collection of cadavers on behalf of the coroner where autopsies are required prior to burial. However, focus groups reported that these services are increasingly being contracted out to private service providers.

Work environment

Funeral directors' staff typically encounter work environments that are either controlled, semi-controlled or uncontrolled. The amount of control is considered to mean the amount of control that the funeral director has over the need for manual handling, the assistive devices and other

control measures available for manual handling assistance. It also refers to the influences on the manual handling process that may increase the risk of the manual handling task. While the home of the deceased is an uncontrolled environment, the mortuary at the funeral home is a controlled environment and the grave or crematorium a semi-controlled environment.

It was reported that funeral staff are exposed to the greatest risk of manual handling injury at the point of collection of the deceased and at the funeral.

Focus:

Impact of work environment on movement of the deceased in the funeral industry

A 220kg deceased male was found on his waterbed. A large amount of manual handling was required to move the deceased from the bed, out of the house and into a transport vehicle. The manual handling was made particularly problematic as a result of the difficulties associated with removal from the mobile surface of the waterbed.

The funeral director's mortuary did not have equipment that could handle a body of this weight and so he was transported to the coroner's mortuary where an overhead crane was used to lower the body into a bespoke coffin. The coffin was too large for the funeral director's hearse and so the transfer vehicle (a van) was used to transport the body to a crematorium many kilometres away, where the furnace doors were larger than those locally.

Collection of the deceased

Home design presents many challenges to the funeral director. Within the home, movement can be impeded by the width of doorways, stair cases and narrow passage ways. The proliferation of single front double storey homes also presents difficulties for removal from upper floors and conveyance to the transport vehicle.

The surrounds of the house, particularly the presence of steps and grass between the house and the transport vehicle, present many problems. It has been reported that in some instances it has been necessary to remove windows and doors to allow for movement inside and out of the home.

The absence of mortuaries at nursing homes and private hospitals was reported to present problems with regard to collection and transfer from the patient's bed. Lifting equipment is often limited, there may be no people available or able to assist, and the presence of other patients in multiple occupancy rooms complicates the transfer techniques that may be employed while maintaining privacy and dignity.

At the funeral

While it was noted that the funeral industry needs to have a long term vision regarding the future development of funeral homes to account for the increasing sizes and weights of cadavers, significant issues also arise at the cemetery, where the environment is beyond the control of the funeral director. Trolley movement is impeded by the ground surface and the additional weight of the coffin and the remains exacerbate the problems. At the gravesite, adjacent monuments and narrow paths limit movement round the grave.

Equipment

Funeral directors reinforced the importance of an agreed definition of the term “bariatric” to assist with procurement and use of appropriate equipment having identifiable weight limits.

Equipment is used in collection, at the mortuary and at the funeral. It was reported that funeral directors have limited equipment for use in the collection of deceased bariatric people, and even if they do have suitable equipment, concern for discretion and the sensitivity of the family may limit the amount of equipment carried in the collection vehicle.

Most funeral directors use trolleys for collection of the deceased. However, trolley widths sometimes necessitate the strapping together of two trolleys for use with bariatric bodies. The weight limits of standard trolleys also present limitations and one funeral director reported moving a body weighing approximately 215kg on a trolley having a safe working load of far less. Another funeral director reported the use of a slide similar to the spine boards used by ambulance services and fire service rescue crews to assist with movement.

The vehicles used to transport deceased to the mortuary also have limitations. Funeral directors cited vehicle width as a major issue. One funeral director described a transport vehicle being able to accommodate four deceased of average width and weight or one bariatric body, by moving an adjustable shelf to create space between the floor and roof of the vehicle. The greater width of this particular vehicle permits the loading of bodies that are well above average width.

Mortuary equipment

Many mortuaries described during the focus groups are set up to enable patient movement by one person. This is possible through the use of hoists and other overhead lifting equipment which assists with movement throughout the mortuary. However, bariatric remains continue to pose problems and movement by a single person is rarely possible.

One funeral director mentioned that on occasions the business has made use of the state coroner's facilities because the deceased equipment at the funeral home did not have sufficient capacity.

Scales that enable accurate measurement of weight are present in some funeral home mortuaries; this enables an assessment for weight comparison with equipment load capacity but more commonly the weight of the deceased enables more detailed information to be forwarded to coffin manufacturers.

Bariatric bodies frequently require bespoke coffins. These coffins are oversized and can weigh between 40 and 60 kg. It was reported that these coffins are box-like and often do not have the aesthetic finish of standard coffins. Reinforcement of the base adds to the weight that needs to be supported during transport.

Funeral Equipment

The main concerns which were raised with regard to the funeral ceremony were associated with the transport vehicle and the burial or cremation processes. In some cases the bespoke coffins do not fit into a normal size hearse. One funeral director has a family coach, designed to allow family members to travel with the deceased to the funeral and the place of burial or cremation. The greater weight capacity and larger rear door of this vehicle means that it lends itself to use as a hearse during the movement of large coffins.

All of the funeral directors raised issues concerning the limitations of lowering devices at the grave. A number reported the use of cranes or other similar devices to safely

Focus:

Issues in bariatric transfer in the funeral industry

A 350kg person died of natural causes in their basement home. Fire fighters were the first to arrive at the scene and transferred the deceased to a slide and dragged that up the stairs to ground level. The ground outside the home was wet, moss covered and slippery.

The funeral director's transfer van could accommodate four people on two levels divided by a hydraulic mezzanine. The mezzanine was adjusted to create maximum space and eight people lifted the deceased into the vehicle.

At the funeral home the mortuary trolley maximum load of 250kg was exceeded. A ceiling-mounted lifting device having a 450kg SWL was used to move the deceased to a bespoke coffin. At the burial, 10 people were required to lower the coffin on straps.

lower the coffin into the grave. In one instance the cemetery's backhoe was used after being equipped with a spreader bar and strapping.

In many cases, cremation is preferred by the family. However, furnace door size restricts the entry of oversized coffins and, in a number of cases reported, prohibited cremation.

In general, funeral director's have limited amounts of equipment. The majority of businesses are small businesses, limiting the ability to invest in, source or alternatively influence the manufacture of specially designed equipment for the industry. As one funeral director noted, where large businesses have purchase procedures and equipment evaluation committees, small funeral homes have one manager who takes on all of those roles.

Focus:

Issues in bariatric movement in the funeral industry

A male weighing an estimated 220kg died in his kitchen. A doctor was called following attendance by ambulance service paramedics. The paramedics called for the assistance of another crew when they realised that they would be unable to move the body alone from the awkward and cramped position in the kitchen. A body scoop was employed during the movement of the deceased whose arms and legs were strapped in place before the body scoop was dragged out of the building and down the front steps. The four paramedics were assisted by family members in lifting the body scoop onto two of the funeral director's transfer trolleys and then into a transfer van that was large enough to take both.

Lifting devices were employed at the funeral home to move the deceased from the transfer trolleys to the mortuary table and later to a bespoke coffin. The coffin was transferred by trolley to the funeral director's chapel where a service was conducted. At the conclusion of the service the family was asked to remain in the chapel while the coffin was transported to the cemetery by transfer van and positioned at the grave. The family was only then asked to attend the grave side while the coffin was lowered. The mechanical coffin lowering device used at the cemetery for most funerals was inadequate for the combined weight of the deceased and the large box-like coffin and eight people lowered the coffin. The standard grave size of 8x4 feet was only just wide enough for the coffin.

Rules and procedures

In general, the weight of the deceased is unknown prior to arrival at the home for collection. Often an experienced estimate determines the weight in situ.

Lifting the deceased from the floor is increasingly presenting problems given the reliance on manual lifting. Combined with the access and movement issues associated with the environment as discussed above, some funeral directors report the need to drag bodies, which is not only confronting to family members in attendance but also to staff members whose uppermost priority is maintaining the dignity of the deceased at all stages of the funeral process.

Concern for dignity was a recurring theme in discussions around the topic of procedures. Dignity of the deceased is clearly of paramount

importance during every phase of the funeral process, from collection , to preparation for the funeral, to moving the coffin and lowering the coffin into the grave. This concern significantly influences how staff members manage the tasks associated with manual handling and what equipment they use.

Cemeteries are imposing additional charges where greater numbers of staff and equipment are required during burial. This creates a tension for funeral directors in terms of protecting their own staff while being reluctant to pass costs on to the family in this highly competitive business environment.

Some funeral directors referred to the need for muscle power in the movement of bodies and suggested that this was at odds with the increasing number of females entering the industry.

While funeral directors may share information and have a very active industry association, competitiveness makes collaboration in transfers unlikely. It was suggested that this limited sharing of information leads to most funeral directors 'reinventing the wheel' rather than learning from shared experiences.

Training and Education

There is rarely any bariatric-specific training, education and information provided to staff. Training and education regarding manual handling tends to be very general. Training and education is sometimes aimed at increasing the expertise of staff to more sensitively manage the family at ceremonies, to avoid letting them see elements of the process that may make them feel uncomfortable, or that may lack the level of dignity that the funeral homes try to maintain.

Reducing risk while preserving dignity and protecting the sensitivities of the family often requires much ingenuity. It was suggested that experience and the ability to undertake dynamic risk assessment on arrival at the home of the deceased are important in risk control. Training that enables this is considered to be of increasing importance.

Fire - Organisational and work environment issues

The core business of a fire service is fire fighting and prevention. However, the broader roles that members of the fire services in Australia play differ from one state to another and between rural and metropolitan operations.

Responsibilities for road accident rescue and other forms of rescue may fall to a fire service. Some fire services, particularly in the metropolitan areas, adopt the role of first responder to medical emergencies. In general, the fire services' contribution is peppered throughout the bariatric patient journey.

Fire fighters refer to the retrieval of a person and movement to safety during an emergency as "snatch and grab". Outside these circumstances and emergency medical response, assistance with manual handling is not a key activity. However, over time fire services have been increasingly attending scenes involving bariatric patients who are unwell and need transport to hospital. They have attended either in the role of emergency medical responder or to assist in the transport of the patient to an ambulance. Fire services have also been known to assist funeral directors in the movement of deceased to transport vehicles. Assistance has also been provided at nursing homes where patients have fallen or movement around the facility is needed.

Work environment

In the metropolitan areas, fire services that undertake emergency medical response duties work in the uncontrolled or semi-controlled environments of public areas, residential dwellings and nursing homes. Members of the service provide first aid and preserve life until paramedics arrive to take over medical treatment. Often service members are requested to stay on to assist the paramedics move patients to the

Focus:

Bariatric deceased movement issues in the fire service

When fire fighters arrived at a home they were advised that police would be arriving soon to assist with movement of a deceased 190kg person. On arrival however, the police officers advised that they would not assist. A private coronial service contractor arrived but possessed no suitable equipment to assist with movement and in addition, the staff were incapacitated owing to an injury. The deceased was moved from the bed on a blanket and dragged to the exit by 4 fire fighters and 4 police officers, the latter assisting out of sympathy for the fire fighters. The deceased was lifted on the blanket down steps and onto the path from where they were lifted onto the contractor's low transfer trolley.

ambulance using ambulance service equipment.

Members also respond to fire emergencies. In this case the fire service may be required to remove conscious or unconscious clients from burning structures.

Fire service representatives reported on the limitations that the home environment can place on crew members and suggested that the most significant problems were associated staircases, particularly spiral staircases, which made patient retrieval difficult under any circumstances. The use of stretchers or other carry devices is particularly problematic on stairs. The turns in a staircase often impede stretcher movement and limit the number of people who can assist.

The fire services often attend patients who are unconscious in the confined spaces of toilets and are wedged against the door or between the toilet pan and a wall, presenting particular challenges in regard to bariatric patient movement.

It was also reported that the confinement of bariatric patients to their bed for prolonged periods with little turning or other movement creates hollows in the mattresses that make lifting extremely difficult.

The distribution and quantity of patient's effects in the home was also reported to impede access and to occasionally make equipment redundant. Homes of hoarders were reported to be the most difficult spaces to work in.

Equipment

Fire service response vehicles do not generally carry patient movement equipment. Two explanations were proffered; the first being one of practicality in that there is limited space on vehicles to carry such equipment.; the second being that carrying equipment would perpetuate the perception that patient movement is a fire service role and responsibility.

The majority of patients who are attended by fire fighters are found on a bed or on the floor. However, it was reported that they periodically attend the scene of a hanging and have to lower the deceased to the ground, exposing the crew to manual handling injury risk. This risk has been identified as increasing with the greater number of obese patients that the service is dealing with. Concerns about the ability to release and lower the deceased from the hanging position with minimal risk, while maintaining the dignity of the deceased *and the* crew, has led to the development within one service of a sash and bolt system with counter weights that permits gentle lowering.

Representatives of one service reported that an equipment committee reviews purchase decisions and equipment function. The terms of reference limit the review to fire and rescue equipment in accord with the stance that non-emergency patient movement is not a fire fighter role.

Rules and procedures

Fire services are sometimes called upon to supply manual lifting power at locations such as nursing homes. The organisations call the fire service to move patients who have fallen from bed or require other manual movement. It was reported that organisational 'no lifting' policies appear to dissuade staff from moving the patients themselves

It was suggested that community perceptions that have historical origins lead to the call to fire fighters for assistance with manual tasks. The increasing reluctance of crews to provide such assistance can lead to confrontation and tension at a scene and a refusal to provide assistance may be very difficult. Concern for the welfare of emergency services colleagues, and sensitivity in regard to the patient and family, can result in the provision of assistance.

One metropolitan fire service reported being called on to assist coronial contractors move deceased people into transport vehicles. It was suggested by fire service representatives, as well as funeral directors, that the practice of leasing body transport contracts to the lowest coronial services tenderer results in the attendance of inadequately equipped and skilled providers.

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 that is available to emergency service call centres can also be used to record additional information about particular addresses and this will help the operations commander make informed decisions about a response to the call for manual handling assistance. If the procedure implementation is successful, it will prevent fire fighters being called only to provide assistance with the movement of obese and bariatric people.

Emergency or "time critical situations" are treated differently and clearly the fire services will attempt to retrieve people in any way possible to preserve life. There is, however, increasing concern for the processes that may be employed at the arrival of the home of a bariatric person where snatch and grab is physically impossible.

Time critical medical responses often require the performance of cardio-pulmonary resuscitation (CPR). The patient's bed rarely provides a base that is firm enough for effective compressions and patients are frequently moved to the floor before CPR may commence. Rapid movement and the effective performance of CPR on obese patients were discussed in the focus group and is an increasingly significant problem for fire fighters.

Training and Education

Manual handling training is general in nature. The lifting and movement of bariatric patients is not considered to be a fire service responsibility and therefore it is not specifically addressed. To reduce the risks in situations where there is little choice but to undertake manual handling of people, one service is investigating the augmentation of their training with manual handling techniques including manutention. While the latter is not universally supported as an effective manual handling strategy, the service under discussion has resorted to such techniques in the hope that they will minimise the impact of lifting.

The perception of the fire services as a helpful service with what was termed a "can do" approach extends to fire fighters who may expose themselves to risk in order to assist. Training is attempting to combat this and provide fire fighters with the knowledge to minimise their involvement in patient movement.

Discussion

Organisational and work environment issues

Work Environment

The degree of control of the work environment significantly influences the risk to carers who interact with bariatric people during their journey through the health care system. In the controlled environment of the hospital many challenges are faced as result of building and facility design limitations and the rate of escalation of the bariatric patient problem relative to the speed with which modifications to buildings may be made. Building design constraints limit the use of both fixed and portable equipment to assist with patient movement. Sometimes features that are designed to improve the quality of the care environment for the patient conflict with the desire to reduce risk to the carer.

Patient movement at the beginning and the end of the bariatric journey generally occurs in uncontrolled environments. The environments are often residential dwellings designed for ambulant people. The building structures and the distribution and quantity of furniture and personal effects present obstacles to handling equipment use. The additional staff needed to assist with care and movement of bariatric patients are not readily available or accommodated. 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.

It is reported that architects are becoming increasingly aware of the issues in regard to the design of new hospital facilities and there are conversations about the problems of building design at both architecture and health care conferences. There is also evidence that bariatric patient care is being considered by hospital management in strategic and long term building plans. However, the environmental issues faced by those attending to bariatric patients' needs at the home or the cemetery are much more difficult to address and carers remain significantly dependent upon the equipment that may be adapted for use within the range of environments encountered.

Equipment

The equipment available for use during the bariatric journey through the Australian health care system 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 a normal weight person 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 (Rush, 2005). The potential scenarios 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.

Much of the bariatric equipment available in Australia is manufactured in the USA. Typically this equipment is labelled in US pounds 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 appearance of bariatric equipment is a significant issue that negatively influences the use of the equipment by both staff and patients. Often, to support the weights of bariatric patients, the equipment is heavily engineered giving it an "industrial" appearance that on the one hand limits use by staff who are aware of patient sensitivities and on the other hand reduces patient acceptance.

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.

All of the services represented in this project expressed a need for improved access to information about bariatric equipment in terms of the range of equipment, the working limits, equipment testing regimes and the pros and cons of the equipment.

A forum through which this information is accessed and discussed would be of benefit to organisations involved in each stage of the bariatric patient journey.

Focus:

The Victorian Bariatric Interest Group (VicBIG)

The Victorian Bariatric Interest Group (VicBIG) was established by its director Janet Hope. Janet is a nurse in the Clinical Nutrition and Metabolism Unit of a Victorian hospital which cares for numerous overweight and underweight patients. Janet's concern about the affect that 'industrial-like' equipment had on patients was a major factor in the establishment of the group.

Adding to the concern was an email sent through the Australian Resource Centre for Healthcare Innovations (ARCHI) seeking advice on bariatric patient care. The large number of replies from around Australia confirmed that many people lacked information regarding bariatric patient care.

In 2002 Janet began to gather information for herself and others and the interest group, VicBIG, was established in 2003. A website has recently been launched (www.vicbig.com). Presentations at conferences continue to grow the interest group and have stimulated the establishment of a sister group in Queensland.

The aim of the interest group is to raise the awareness of the complexity of safe and dignified management of bariatric patients. It provides a forum through which healthcare staff may access people who can answer questions and assist them in their plight to set up centres for better bariatric care. It also raises awareness of patient care from the patient's perspective, simplifies the process of equipment supply and disseminates a range of information so that when challenges arise there is a point of reference for interested persons.

Currently, VicBIG's members include equipment manufacturers and suppliers, occupational therapists, physiotherapists, doctors, directors of nursing, OHS representatives, WorkSafe Victoria and hospitals and it meets four times a year (February, May, August and November). Meetings involve guest speakers to talk about different aspects of bariatric patient care. People interested in joining VicBIG or sponsoring the ongoing work of the group can contact Janet whose details are listed on the VicBIG website.

Funeral directors appear to have the least access to information about bariatric equipment and would benefit considerably from the sharing of information across services. However, being in the main small businesses, they are very limited in their capacity to purchase specialised

handling equipment given the relative infrequency of deceased bariatric person movement.

Rules & Procedures

The definition of “bariatric” varies between hospitals and across sectors. Some rely on BMI but the BMI value used to identify bariatric patients 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 are triggered by advice that the arrival of a bariatric patient is imminent. They permit the planning of care and preparation of appropriate equipment. The absence of consistent definitions means that triggers may not be activated.

Patient weight and size is usually unknown by those collecting a bariatric person from their home or by those receiving them at the hospital. This may be because the person has not been weighed for some time or because patient or family embarrassment leads to mis-information about weights being passed on. Fear of being stigmatised or being denied access to certain treatments as a result of size sometimes leads to the patient providing misleading information about their weight. General practitioners rarely provide information about size and weight of patients at the time of referral and it is common for patients to be referred for out-patient services such as rehabilitation without accompanying information.

“No lifting” policies are reducing manual handling injuries in the health care sector (Martin, Harvey, Culvenor, Payne, & Else, 2004) and when correctly implemented have the capacity to satisfactorily assist with the management of bariatric patients. Martin et al {Martin, 2004 #1121} evaluated The Victorian Nurses Back Injury Prevention Project (VNBIPP), the basis of which was the No Lifting policy adopted by the Australian Nursing Federation (Victorian Branch), in 1998. They concluded, “There is clear evidence of reductions in the claims incidence rate, days lost due to injury, and workers compensation costs, attributable to the implementation of nurses’ back injury prevention programs based on No Lifting principles and supported by the VNBIPP intervention.”

However, in institutions where No Lifting policies have not been correctly implemented or where personnel have not received adequate training in its operation, the risk is to some extent being transferred to other providers such as the ambulance and fire services which are being called to move patients. Some fire services are limiting the provision of assistance in non life threatening situations through the application of

policies but concern for patient dignity and the welfare of colleagues in other services can compromise the application of the policy in practice.

In general 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, but the totality of the journey is unclear. There is some misperception that the journey is linear. A picture of the whole journey is difficult to find and there is some need for a clear, perhaps pictorial, representation of the journey and the interfaces between the agencies and carers and their respective roles.

Education & training

The level of training and education among the services represented in this project varies. In the funeral and fire services the training and education of staff is limited to general manual handling with little focus specifically on the movement of bariatric people. The training offered within the ambulances services varies from none to annual training and periods during which experience with a bariatric vehicle is provided. The efficacy of training is sometimes limited by the infrequency of its application, staff turnover and the employment of agency staff in hospitals.

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 and, as found with the fire services, a sense of obligation to members of other services can override policy positions.

The dynamic environments within which staff 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. Skills in dynamic risk assessment and creative problem solving are important and all occupational groups represented in this project felt they could benefit from the development of appropriate training packages.

The provision of information is particularly important for small businesses which dominate the funeral industry. The industry's association is an important vector in the sharing and transmission of information and could be a broker for training materials. The role of this body has the potential to overcome some of the difficulties associated with collaboration within this highly competitive sector.

Support for independent groups such as the Victorian Bariatric Interest Group which, alongside the industry associations, may assist in transmitting and making available the experiences of a range of people to a wide audience.

Conclusion

The purpose of this project, Manual handling risks associated with the care, treatment and transportation of bariatric (severely obese) patients and clients in Australia, was to address the four research questions:

- What are the OHS risks associated with manual handling of bariatric patients to which workers such as nurses, ambulance officers, fire fighters, and those in the funeral industry in Australia are exposed?
- What measures (e.g. plans, policies, processes and equipment, supported by adequate training) have been introduced in Australia to reduce or eliminate the risks?
- How effective are the above measures?
- Where might further intervention be required to control the risk in Australian workplaces?

In answering these questions the research found that 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, there appears to be a lack of knowledge about how to safely manage the unique needs of bariatric patients. There appear to be few streamlined systems established for patient management and many cases are managed as if they are an isolated experience. There is little documentation of systems or case experiences and thus very little sharing of the experience.

The Australian Bureau of Statistics reported in 2005 (ABS, 2005) that in 2004-05, some 41% of adult males and 25% of females were classified as overweight (Body Mass Index [BMI] of between 25 and 30) and 18% of males and 17% of females were classified as obese (Body Mass Index over 30). This represents a substantial increase in the proportion of adults classified as overweight or obese since 1995. Recent estimates (Stewart et al., 2008) suggest that in Australia 7 out of 10 middle-aged men and 6 out of 10 middle-aged women aged between 45 and 64 years are overweight or obese.

The manual handling risks to carers 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. In general the risk to carers is influenced by the design of the range of environments within which patient movement is undertaken. 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 application of safe handling procedures.

The range of handling equipment available for use with bariatric patients is limited and its effectiveness is compromised by the environments within which it is used. The majority of the equipment available in Australia is imported and the range available is limited by the relatively small market in this country. The design of some equipment does not adequately account for the size, shape and weight distribution of bariatric patients and the small number of purchasers largely working in isolation from one another are limited in their ability to influence designers. All sectors involved in the bariatric patient journey find that equipment availability is limited in regional and rural areas and small businesses such as funeral directors are limited in their capacity to purchase specialised equipment given the relatively low frequency of use.

Larger organisations such as hospitals, ambulance and fire services generally have developed policies and procedures that address the movement of bariatric patients and the purchase and use of equipment. The efficacy of these procedures is hampered by the absence of a standard definition of the term “bariatric” and the gaps in information flow during the bariatric patient journey. 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.

At least one fire service in Australia is attempting to limit bariatric patient movement to emergency situations only. In this way, the service is attempting to reduce the risk of manual handling injuries to its own staff and transfer the risk to those services whose role is defined as including patient movement. Fire services have historically been associated with the provision of manual handling support to a range of other parties and attempts to change this perception and the role of fire fighters will result in greater pressure on ambulance services and funeral businesses to develop patient handling solutions that they may use independently.

The funeral sector predominantly comprises small businesses and operates largely without formal or written procedures. Training and education is also limited and the processes for safe movement of bariatric remains are largely based on experience and observation of peers. Hospitals, ambulance and fire services generally do provide manual handling training to staff but the degree to which this addresses the specific issues relating to bariatric patient movement vary widely.

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.

The project has increased our understanding of the practical issues associated with the care and movement of bariatric persons during their journey through the health care system in Australia. The project was exploratory in nature and substantially more work is required to inform the development of intervention strategies that will lead to significant and sustained risk reduction. To inform discussions about the development of such strategies and to support some preliminary intervention work that will improve approaches to manual handling that ambulance, fire, hospital and funeral services staff face, some suggestions for further work follow:

It is suggested that further work is required in each of the following areas:

- The lack of a standard definition of “bariatric” and a definition that accounts for the size and shape of patients hampers inter-agency communication as well as equipment purchase. A more informative definition of “bariatric” needs to be agreed and promoted for use among those agencies that assist with the bariatric journey through the health care system.
- Further work is needed to quantify the frequency of bariatric patient movement within the emergency service, hospital and funeral sectors across Australia.
- Poor communication, lack of information, lack of standardisation of equipment and incompatibility of equipment between carer agencies in the bariatric journey leads to staff being exposed to increased risk of manual handling injury. An in-depth investigation of the interfaces between agencies is needed for the purposes of identifying obstacles to the improvement of patient and information flow.
- The limited interaction between agencies involved in the bariatric journey and the absence of a coordinated approach to manufacturers and suppliers of equipment creates a number of problems for purchasers, users and patients. A process for facilitating an inter-agency dialogue as well as a dialogue with equipment suppliers and manufacturers is needed. It is suggested that this may commence with an event during which an equipment exposition is a focus and agency workshops and seminars are facilitated. Representatives of ambulance, hospital and funeral services should be involved in this.
- Following such an event, agencies may collectively engage with local manufacturers of patient handling equipment to design *bariatric* equipment suited to the Australian environment and having the following features:
  - Design accounts for the range of shapes and sizes of bariatric patients;

  - Design accounts for load concentrations associated with variation in patient weight distribution;
  - Load limitations are tested using dynamic tests rather than static;
  - Design is sensitive to patients' concern for the aesthetics of equipment and stigmatisation that may be associated with its use;
  - Design incorporates the principles of Safe Design.

- Hospital and other care facilities have not generally been designed with the movement of bariatric patients in mind. It is suggested that processes are identified that will facilitate interaction between health care representatives and the Australia Institute of Architects. Such interactions should aim to make members increasingly informed about the complexities of bariatric care and sympathetic to the needs of health care institutions into the future. The application of Safe Design principles should be a focus for such interactions.
- Hospitals are relatively controlled environments while the home and cemetery are uncontrolled and semi-controlled respectively. While improvement in the design of the home with respect to bariatric patient issues has limited potential, it is suggested that cemetery trusts are made aware of the problems associated with the movement of deceased bariatric persons such that road and pathway design may be sympathetic to the needs of funeral directors in moving clients using wheeled equipment.
- Ambulance services and funeral directors share unique problems in the retrieval of bariatric people from the home environment. It is suggested that these services commence a dialogue regarding the sharing of ideas and innovations and the compatibility of equipment and procedures that will improve inter-agency interactions.
- Engagement with standards setting bodies such as Standards Australia is suggested regarding the merits of an Australian Standard for equipment design and manufacture and for the purchase, use and maintenance of bariatric equipment.
- Many agencies make equipment purchase decisions in isolation and are unaware of the full range of equipment that may be available and the experiences of others with that equipment. Establishment of a central repository of information regarding the pros and cons of bariatric equipment used in Australia would be beneficial.
- A number of agencies are developing purchasing policies and procedures and are documenting patient handling processes having the aim of minimising risk to staff although there is limited sharing of this information. Establishment of a central repository of information and exemplar policies and procedures would be beneficial.

- Most funeral businesses are small and lack the capital to invest in the equipment that is needed for bariatric patient transport. It is suggested that the feasibility of the operation of independently managed equipment pools in metropolitan and regional centres is explored.
- The numbers of bariatric patients moved in regional and rural areas is relatively small making the provision of specialised equipment more difficult for agencies to justify. It is recommended that processes that could be used to increase the accessibility to equipment by hospitals and ambulance services are explored.
- All carers involved in the bariatric journey have to make decisions regarding patient movement on the basis of the circumstances with which they are faced at any given point in time. As such, the ability to assess risk and make appropriate risk minimisation decisions is essential. Training and education in regard to bariatric patient movement varies widely among agencies and it is suggested that opportunities are created for the sharing of information and experiences regarding the training of staff in dynamic risk assessment.
- The patient's entry to the bariatric journey often commences with a referral from a general practitioner. It is suggested that agencies would benefit if general practitioners were informed regarding the importance of providing information about the size and weight of bariatric patients at the time of referral.
- In general there appears to be limited understanding of the entire bariatric journey among representatives of the individual agencies. A clear, perhaps pictorial, representation of the journey and the interfaces between the agencies and carers and their respective roles would assist with the understanding.

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Appendix 1 - Focus Group Meeting

Question Route

Opening questions (round robin)

How have you been involved in moving and manual handling of bariatric people?

Introductory questions

Tell us about your role in the journey that a bariatric person takes when requiring care?

What sorts of things increase the OHS risks when moving bariatric people?

Transition questions

Think back over the last year or so and tell us about one particular instance, when you were moving a bariatric person, that really sticks out in your mind

Tell us about the problems you experienced with this person as well what you think worked well

Key questions

Tell us about the things that limit your ability to safely handle bariatric people

Tell us about the strengths and weaknesses of the equipment you use to handle bariatric people

Tell us about the strengths and weaknesses of the environments you handle in when moving bariatric people

Tell us about the strengths and weaknesses of the training and education of your staff in regard to movement of bariatric people

Tell us about the strengths and weaknesses of any procedures your organisation uses to control risks while moving bariatric people

Ending questions

All things considered, do you think that, when we take bariatric patients on the journey from home to hospital and back to home or the funeral home, the risk to staff is adequately controlled?