THE BARIATRIC JOURNEY IN AUSTRALIA: AMBULANCE CASE STUDY

MARCH 2009

Australian Government
Australian Safety and Compensation Council

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Acknowledgement

This review was commissioned by the Department of Employment & Workplace Relations (DEWR), Office of the Australian Safety & Compensation Council (ASCC). The review was undertaken by VIOSH, University of Ballarat's Steve Cowley and Susan Leggett who provided this research report.

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ISBN 978 0 642 62795 6

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There is an increasing awareness of the risks carers of morbidly obese (bariatric) patients face during their transport and movement from home to the health care institution and then home again, or potentially to the mortuary and then to a funeral. This transport and movement has been termed “the bariatric journey” (Hignett et al 2007).

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). Increases have been recorded in both the overweight and obese groups across all age groups in recent years.

Morbidly obese patients are over represented in the use of healthcare. Further, there is a high mortality rate for these patients because of the patients’ delay in accessing treatment. It is possible that this delay may be in part due to there being limited capacity within institutions to manage care.

The bariatric patient’s journey within the health care system commences with transport from the patient’s home by ambulance. On arrival at the hospital as an out-patient the journey continues through to specialist departments such as radiography, or through to a ward as an in-patient 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, the deceased is transported via the mortuary to a funeral home and finally to the funeral service.

Bariatric patients generally have limited mobility and decreased lung capacity because of the weight of the chest wall. This reduces the patient’s ability to assist during movement. Problems other than handling their weight arise because patient handling equipment, buildings and facilities are not designed for large body masses and shapes. Therefore, there are special demands placed upon carers throughout this journey with regard to patient lifting and movement.

The bariatric patient handling case studies aim to illustrate the problems that are encountered and the solutions that have been developed by

health care providers and others to assist the handling of bariatric people during their journey within the health care system in Australia.

This case study describes the particular problems that the Ambulance Sector experiences and the limited options that are available to implement solutions.

This case study is part of a project funded by the Australian Safety and Compensation Council (ASCC) in 2008. The research consisted of a literature review and conduct of focus groups with personnel involved in the transport of bariatric patients. The full report of the work can be accessed via the ASCC web site at www.ascc.gov.au.

Ambulance Sector Issues

Ambulance officers and paramedics work in uncontrolled environments. In regard to bariatric patient handling, those environments are generally residential dwellings. Such environments are designed for ambulant people and 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. Generally, patient weight is unknown at the time that a call to the ambulance service is received.

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. Preservation of patient dignity is a major issue for carers and the attention of neighbours and even media can influence the strategies that are used in patient movement.

The removal of door frames to enable the movement of bariatric patients and the employment of cranes and removal trucks has been reported. Other factors that limit patient movement are narrow corridors, stairs, furniture and the patient's effects.

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

Only the South Australian Ambulance Service (SAAS) and New South Wales Ambulance services have dedicated and equipped bariatric transport vehicles. A dedicated bariatric transport vehicle is, at the time of writing, undergoing trial in Victoria.

This case study describes the equipment and systems that SAAS is developing to manage the increasing demands for bariatric patient movement and to simultaneously reduce the risk of injury to paramedic staff.

South Australian Ambulance Service (SAAS)

Introduction

The South Australian Ambulance Service (SAAS) is an independent organisation that provides clinical care and health related transport services to over 1.5 million people in South Australia, distributed across an area of 1,043,514 square kilometres, however, most patient movements are within the metropolitan area.

The service provides emergency, non-emergency, aero-medical, rescue and retrieval services across the entire state. It employs approximately 900 full time paramedics and over 1,300 volunteers and transports approximately 2,200 patients per annum using its fleet of 220 ambulances.

The service transports approximately 150 bariatric patients per year of which approximately two-thirds are emergency cases. It has been found that 10-15% of patients weigh between 120 and 140kg and approximately 50% of these justify the use of bariatric equipment.

An increasing number of bariatric patients, and recognition of the risks that paramedics face during movement, led to SAAS investigating and then developing a system for patient retrieval and transport.

The SAAS Bariatric Patient Equipment

Overview

The South Australian Ambulance Service (SAAS) has invested in specialised equipment including stretchers, HoverJacks, patient slides and a powered trolley. The equipment is transported by a dedicated vehicle.

The Maxi-lift Stretcher and Maxi-trolley have been designed for use as a unit to accommodate patients who exceed 182kg, which is the safe working load of the stretcher used on all ambulances, or have physical attributes that prevent carriage on the standard stretcher. Patients up to 260kg may be transported using the Maxi-lift Stretcher and Maxi-trolley combination.

The Maxi-trolley is a mechanical lifting device onto which the Maxi-lift stretcher is placed along with other equipment that will be used to assist in movement of the patient.

All equipment is stored onboard a dedicated bariatric equipment transport ambulance. The ambulance is a standard vehicle that has been fitted with a tail lift and has been stripped of standard stretcher mountings and attendant seats.

Equipment Inventory

The bariatric equipment transport ambulance is fitted with a tail lift and floor-mounted channels to secure equipment. The vehicle is housed at a central location and responds to either emergency or planned patient movements.

The ambulance, a Mercedes Sprinter, is equipped with basic life support equipment and on-board oxygen supply. Otherwise the equipment is limited to that associated with patient movement. This equipment comprises:

The Maxi-trolley which is a mechanical lifting device onto which the Maxi-lift stretcher is loaded. This is a piece of equipment designed by personnel within the SAAS. It is manually propelled. Height adjustment is via a screw ram powered by a 12volt battery.

The Maxi-trolley loaded with the Maxi-lift stretcher

A Maxi-lift stretcher which is a large capacity wheeled stretcher.

The Maxi-lift stretcher

A HoverJack which is an air powered device that enables the lifting of a patient from floor to bed or stretcher level in a supine position. The device is a four cell mattress inflated sequentially with the patient in position.

The HoverJack

A HoverMatt lateral Patient Transfer Device which is an air mattress with a perforated underside.

A low pressure air supply inflates the mattress with the patient in position and the air escaping from the underside reduces friction making movement easier.

Other equipment used includes:

Sections of rubber matting that can be laid and re-laid to create a path over which the HoverMattt may be moved. The total length of sections is 12m;

A lifting sheet that is designed for separation along its length. This sheet has rods that may be inserted through the side handles permitting up to 10 people to lift;

The lifting sheet

Patient slides. These are smooth, low friction plastic panels that enable sliding of patients and may also be used to protect patient flesh which is sometimes subject to damage from minor impact and abrasion during movement; and

Straps to be used for dragging and controlling the movement of devices.

The bariatric wheel chair

The bariatric patient vehicle may be used to transport a patient seated in a bariatric wheel chair. The wheel chair is not stored on board and will be loaded as a replacement for the Maxi-Trolley should such a patient transport be planned.

The patient transport system

The principle underpinning the bariatric patient transport system is that patients will receive a standard clinical response by a normally-equipped ambulance. The bariatric equipment transport vehicle follows a standard response and is employed to provide the equipment for use in movement of the patient.

Within the SAAS 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 120kg, a second crew is dispatched to the call location. An assessment of the patient's circumstances is made at the scene and the paramedics may call for the services of the bariatric equipment transport vehicle. Assessment includes consideration of the possibility of using a bariatric wheelchair for movement.

A management representative will attend with the bariatric equipment transport vehicle. The bariatric vehicle crew are trained and experienced in the use of the vehicle and its equipment and perform the role of "load-master" at the scene. The vehicle is staffed between 07.00hrs and 19.00hrs, 7 days per week, although outside these hours, there are members of rostered crews available who have the knowledge and skills necessary to respond with the vehicle.

On arrival at the scene, the Maxi-Trolley is unloaded using the transport vehicle tail lift. The Maxi-trolley is moved as close as possible to the patient. Depending on where the patient is positioned, they are moved using a combination of equipment items. Typically a patient would be lying on a bed. In this case, the HoverMatt is moved under the patient with the blue lifting sheet and towels above it (this may require log-rolling of the patient).

The HoverJack is inflated adjacent to and to the height of the bed before the HoverMatt is inflated and used to pull the patient onto the HoverJack, where they are secured. The patient is lowered to the floor through deflation of the HoverJack.

The HoverMatt is then used to drag the patient to the Maxi-trolley, employing the rubber matting to provide a suitable surface where necessary.

The HoverJack is positioned next to the Maxi-trolley and used to elevate the patient on the HoverMatt to the level of the Maxi-lift stretcher, where they are moved to the stretcher and the HoverMatt is deflated.

The bariatric patient on the Maxi-lift stretcher, which is on the Maxi-trolley, is wheeled to the standard ambulance from which the standard stretcher has been removed. The Maxi-trolley is height adjusted and the Maxi-lift stretcher is rolled into the ambulance which transports the patient to the hospital. The standard stretcher is loaded onto the Maxi-trolley which is in turn loaded into the bariatric vehicle which follows the standard ambulance.

At the hospital, the Maxi-trolley is used to unload the patient on the Maxi-lift stretcher and transport the patient to the admissions area. The HoverMatt is used to move the patient to the hospital bed at which point it is recovered along with the remaining equipment and reloaded to the bariatric vehicle. The standard stretcher is returned to the standard ambulance.

Procedures

The movement of patients using the bariatric equipment is fully documented within SAAS written procedures that are available to all staff.

The system is operated by experienced and trained staff who have been seconded for extended periods to the role. However, all paramedics are rotated through a position with the vehicle and the seconded staff, so that they also gain experience and knowledge of the system.

Staff attend a three day manual handling training program at the time of induction to the organisation. The paramedics are trained to find means of moving patients that, where possible, avoid or limit lifting. They are trained to assess the environment within which the patient is to be moved and how to employ the equipment to assist in movement. Manutention[1] techniques are also included in the training. All staff attend a one day manual handling training update annually.

[1] manual handling techniques that are designed to minimise lifting and the impact of lifting.

Limitations

The system is obviously limited by the availability of the vehicle although current demand is being met in the metropolitan area. Patient transport using the system in regional areas is generally pre-planned but is time consuming and costly to the organisation.

Five powered stretchers have been procured and the folding leg structure is at the time of writing being modified to suit the loading of SAAS ambulances without having to support the stretcher weight. Three of these stretchers will be permanently deployed in rural centres to assist with bariatric patient movement in the absence of the fully equipped vehicle. It is planned to increase the staffing of the vehicle in the metropolitan area to 24 hrs 7 days per week.

The system is not suited to air ambulance use as generally bariatric patients and equipment, when accompanied by paramedics, exceed load limits for aircraft.

The Maxi-trolley has a tare weight of 100kg and is manually propelled with four pneumatic wheels which are not suited to all environments. For these reasons the service is experimenting with a self-propelled, tracked vehicle having a height adjustable platform to replace the trolley. At the time of writing a prototype vehicle is being tested in the workshop.

Summary of process for retrieval of patient from a bed at home.