

Case Study: Ambulance Paramedic Low Back Injury and Workplace Rehabilitation

Philippa Grimes
P O Box 1954, Wellington 6140, New Zealand
philippa.grimes@pohs.co.nz

ABSTRACT

Manual materials handling at work is a recognised risk factor for low back discomfort, pain and injury in the workplace. Low back pain and injury are common and can be personally, financially and socioeconomically disruptive and expensive. This case study describes the workplace assessment and rehabilitation of a 48 year old male ambulance paramedic officer who sustained a low back injury at work. His injury history, work tasks, and work environment are outlined. It was 4½ months from the time of paramedic officer's injury until he resumed a full work capacity. The workplace assessor was involved for three months. Aspects of manual materials handling in the workplace that might predispose ambulance paramedics to low back pain and the cost of the paramedic officer's work injury are discussed. This case study is at a micro-ergonomics level, but macro-ergonomics factors are relevant too.

INTRODUCTION

Manual materials handling (MMH) is an integral part of an ambulance paramedic officer's work, and the risk of developing a low back injury is ever present. ACC statistics from 2003 to 2007 show that the number of new workplace back injuries increased from approximately 5000 to 6000, as did injury costs (from approximately \$25,000,000 to \$30,000,000). One of ACC's injury prevention strategic goals is to substantially reduce serious musculoskeletal injuries. Low back pain and its associated disability is a disruptive societal burden, affecting a very high percentage of the work force (Maniadakis & Gray, 2000). Its costs are also high (Linton & Nordin, 2006).

The management of low back injuries has undergone a major change in recent years. The traditional approaches emphasised bed rest and passive treatments. These have been deemed ineffective and have been replaced with principles of activation and rapid rehabilitation. There is strong evidence that work is generally good for health, promotes recovery, and is an essential part of rehabilitation (Waddell & Burton, 2006). Increasing activity and early return to some form of work generally improves the occupational outcomes for most musculoskeletal conditions. Employers having a critical (and often time-consuming) role in providing staff with an opportunity to maintain their work habits during their recovery. Successfully coordinating all parties can be challenging, but is usually vital in achieving a successful outcome. This case study describes the history, workplace assessment, rehabilitation, and costs of an ambulance paramedic who sustained a low back injury at work.

WORKPLACE ASSESSMENT

History

E sustained a low back injury (lumbar disc protrusion and right radiculopathy) at work. His initial symptoms developed over two consecutive days, which he described as 'heavy'; the first one involved lifting an overweight patient downstairs. About a week later E was awoken at 1.00a.m. with a sudden worsening of his back pain. He was about to go on 20 days leave overseas. E went to his GP, was prescribed pain

relief medication and one day off work. While on leave his symptoms increased, requiring one day's hospitalisation. When he returned from leave E's ability to carry out his usual job was markedly limited. He remained at work, but on alternate duties and on a modified roster. E attended physiotherapy treatment. Two months post-injury E's ACC case manager made a referral for a workplace assessment and a graduated return to work programme.

Work task analysis

Paramedic officers' role is demand driven. They deal with serious injuries and fatalities on a daily basis. They attend accidents, emergencies and other requests for medical assistance, provide pre-hospital care, assess health of patients and need for assistance, administer drugs, resuscitate and defibrillate patients, operate life-support equipment, transport accident victims, sick and disabled persons to treatment and/or rehabilitation facilities, attend public gatherings and sporting events where accidents and other health emergencies may occur, keep ambulances adequately stocked and maintain equipment in good working order, and prepare reports on patients' injuries and treatment.

Paramedic officers' functional activities are walking and standing (frequent), sitting (occasional to frequent), stretching and reaching (occasional), bending, squatting, crouching or kneeling (frequent), lifting, pulling, and carrying (occasional to frequent), driving (frequent), holding hand-held objects e.g. medical equipment (occasional to frequent), computer and paper work (occasional), and mental activities (occasional to frequent). The demand levels range from sedentary to very heavy physical. On average, only 40% of a paramedic officer's time is spent in 'active duty'; 60% is spent on maintenance, re-stocking, rest, and awaiting calls. High levels of communication, health care and first aid skills are fundamental.

Paramedic officers work on the shift roster, 24 hours per day, 7 days per week. E's cycle was 48 hours every 8 days, 2 day shifts (11 hours), 2 night shifts (13 hours), then 4 days off. There are two ½ hour meal breaks each shift, but these are interrupted if a high level emergency occurs. Ambulances are either single or double crew.

Workplace assessment evaluation tools

Three evaluation tools were used to assess E's MMH. E reported a '15' i.e. 'Hard' for Borg's Rating of Perceived Exertion (Borg, 1985). A Rapid Entire Body Assessment score of '13' represented a risk level of 'Very High' (Hignett & McAtamney, 2000). The Code of Practice for Manual Handling Risk Score was a '30', signifying that injuries are possible for trained and fit people (Department of Labour, 2001). E's cardiovascular fitness was not tested and no psychosocial factors were evident.

Work environment and equipment

A paramedic officer's work environment includes the ambulance base, the ambulance (driving and rear compartments), accident scenes, people's homes, and inside treatment or medical facilities. Paramedic officers work in all weathers and may work in dangerous and difficult situations. In addition to MMH injuries, their work exposes them to motor vehicle accidents, physical assault, hazardous substances and dangerous goods, fatigue, burns, electrocution, and psychological trauma.

The main equipment carried by a paramedic officer is a resuscitation pack (back pack up to 15 kg), an oxygen bottle (up to 5 kg) and a defibrillator (10–15 kg). These three

items individually or between two staff. Stretchers are self-loading and height-adjustable. They weigh 25 kg when empty, plus patient weight (ranges from very light to over 100 kg). Other equipment used is a carry chair, a transfer board, and a lifting belt/sling.

WORKPLACE REHABILITATION

The goal of E's return to work plan was to full-time hours and a full work capacity (known as 'road capacity') within a specified timeframe. As the workplace assessor, my role was to monitor the plan and maintain liaison between all personnel involved. At least 12 personnel were involved at various times. I was involved for just over 3 months, during which I had over 25 communications (telephone, email or case meetings) with various personnel; notable among them were the operations manager and the rehabilitation physiotherapist (who provided a functional reactivation programme). During E's first 8 weeks post-injury he saw 5 different doctors and 3 different physiotherapists. There was a period when E was still 'fully unfit for work' when I felt his back injury might become persistent. This was largely due to iatrogenesis. Case meetings and communication to the relevant medical personnel resolved this.

Once E had medical clearance to return to full duties he underwent his employer's 'Return to Work Manual Handling Assessment'. The assessment included lifting a patient in a carry chair up and down stairs, transferring a patient from a carry chair to a self-loading stretcher, and loading and unloading a self-loading stretcher. The leg lift method and a share lift of a 70-80 kg patient were tested. It was 4½ months from E's injury until his return to a full 'road capacity'. An estimated cost of his injury was \$10,000.00.

DISCUSSION

MMH risk factors for paramedics has parallels to other emergency services e.g. firefighters. Paramedics have individual skills and qualities, but they mainly work as a team. This requires flexible coordination, interaction and communication between team members, its importance being described as 'distributed cognition' (Furniss & Blandford, 2006). During E's recovery, he initially worked as a supernumerary crew member. He commented this altered the team dynamics. E did not find the work meaningful and was frustrated being 'an extra'. The interminable problem of limited personal control over job content surfaced. Fortunately, E's high motivation and his supportive employer paved the way for a good quality occupational outcome.

A study of the effects of a one year exercise programme on fatigue during ambulance work concluded it can be reduced by a physical exercise programme (Aasa, Angquist, & Barnekow-Bergkvist, 2008). E felt that his participation in the functional reactivation programme was a turning point in his recovery. This factor, and its timing, possibly represented a 'window of opportunity' that prevented E's condition from becoming sub-acute and/or persistent.

A number of studies have examined risk factors for emergency service staff developing back injuries e.g. the physiological demands of using different types of stretchers (Kluth & Strasser, 2006). End user acceptance (a recognised ergonomics principle) of features such as portability has been explored (Conrad, Reichelt, Lavender, Gacki-Smith, & Hattle, 2008). Training in correct work techniques is widely used to manage MMH risks, but its effectiveness has been questioned

(Martimo et al., 2008). The LITE approach for patient handling states that a weight over 16 kg increases the risk for carer and patient (ACC, 2003). Many paramedic MMH tasks fall outside of this, the carry weight often being beyond their control.

Workplace MMH injuries and their workplace rehabilitation can be complex and expensive. Among the identifiable costs are weekly compensation, employer staff time (e.g. team leader, human resources, payroll), and medical and rehabilitation personnel fees. Although the total cost of E's injury seemed high, he resumed his pre-injury work capacity and there were no ongoing rehabilitation issues or costs.

CONCLUSION

This case study has described the multiple components of a workplace assessment and rehabilitation involved in managing a workplace low back injury. By persisting with a cohesive team approach, facilitating a stay-at-work approach, and having an effective return to work programme, a good quality occupational outcome was achieved. The paramedic officer returned to a productive life, and within an acceptable timeframe considering the nature of his injury.

REFERENCES

- Aasa, U., Angquist, K.-A., & Barnekow-Bergkvist, M. (2008). The effects of a 1-year physical exercise programme on development of fatigue during a simulated ambulance work task. *Ergonomics*, 51(8), 1179-1194.
- ACC. (2003). *The New Zealand Patient Handling Guidelines: The LITEN UP Approach*: ACC WorkSafe.
- Borg, G. (1985). *An introduction to Borg's RPE-Scale*. Ithaca, New York: Movement Publications.
- Conrad, K. M., Reichelt, P. A., Lavender, S. A., Gacki-Smith, J., & Hattle, S. (2008). Designing ergonomic interventions for EMS workers: concept generation of patient-handling devices. *Applied Ergonomics*, 39(6), 792-802.
- Department of Labour. (2001). *Code of Practice for Manual Handling*. Wellington: Department of Labour.
- Furniss, D., & Blandford, A. (2006). Understanding emergency medical dispatch in terms of distributed cognition: a case study. *Ergonomics*, 49(12 & 13), 1174-1203.
- Hignett, S., & McAtamney, L. (2000). Rapid Entire Body Assessment (REBA). *Applied Ergonomics*, 31, 205-209.
- Kluth, K., & Strasser, H. (2006). Ergonomics in the rescue service - ergonomic evaluation of ambulance cots. *International Journal of Industrial Ergonomics*, 36(3), 247-256.
- Linton, S. J., & Nordin, E. (2006). A 5-year follow-up evaluation of the health and economic consequences of an early cognitive behavioral intervention for back pain: a randomized, controlled trial. *Spine*, 31(8), 853-858.
- Maniadakis, N., & Gray, A. (2000). The economic burden of back pain in the UK. *Pain*, 84, 95-103.
- Martimo, K.-P., Verbeek, J., Karppinen, J., Furlan, A. D., Takala, E.-P., Kuijer, P. P. F. M., et al. (2008). Effect of training and lifting equipment for preventing back pain in lifting and handling: systematic review. *British Medical Journal*, 336, 429-431.
- Waddell, G., & Burton, A. K. (2006). *Is Work Good for your Health and Well-Being?* London: TSO.