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Does the MAST Suit have a Future in Pre Hospital Care?

By Veronica Madigan

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Overview

The use of the MAST suit in the pre hospital care environment has always been controversial. Researchers, physicians, paramedics and ambulance officers all have varying opinions as to the efficacy of its use. As the MAST suit is currently under review in the Australian pre hospital care environment, it is timely to revisit past and present research evidence regarding the efficacy of this clinical tool. Further, recommendations from a 'Position Paper' written for the National Association of EMS Physicians in 1997 are also presented.

Precise

In June, 2000 I wrote a Discussion Paper for the Australasian Journal of Emergency Care which posed the engaging question: 'The MAST Suit in Pre Hospital Care – Does it have a Future?*' The paper was a result of a systematic review of both the National and International literature and basically outlined the historical development, indications of use and reported 'mechanisms of action' of the MAST suit and then challenged past clinical assumptions about its effectiveness. In addition, the paper examined published research findings involving randomised and controlled trials of the MAST suit in the pre hospital care environment and made several recommendations.

In revisiting the International studies*, the paper found that the MAST suit generally represented no benefit or survival advantage to adult patients in the pre hospital care environment presenting with severe hypotension related to trauma, blunt non-penetrating trauma, primary thoracic injuries and primary abdominal injuries. However, it must be noted that there was a small but statistically significant survival advantage in trauma patients with severe hypotensive (BP < 50 mmHg).

In contrast, preliminary studies by Polando *et al* (1990)* found that the MAST suit was an effective splinting device to immobilise lower limb and pelvic fractures. However, there was general clinical consensus in the literature recommending further research and evaluation in the pre hospital care environment.

As a direct result of the Mattox *et al* study (1989)*, the paper reported that the MAST suit was withdrawn from use from ambulances throughout the Houston Texas Fire Department and the Emergency Centre of the Ben Taub General Hospital in Houston, Texas.

Clinical Update

Since my review of the available literature in 2000, several other studies and papers have been identified on the Cochrane Trials Register and associated

medical databases (Cooper *et al*, 1992; O'Conner *et al*, 1997; Dickinson & Roberts 2002). While these studies generally concurred with the previous findings of the MAST suit, there were some findings of interest to the Australian pre hospital care environment.

In 1992, Cooper and associates retrospectively reviewed 436 paediatric trauma MAST suit patients drawn from the National Paediatric Trauma Registry. These patients generally suffered blunt trauma injuries and presented in hypotensive shock. The study found the application of the MAST suit not only increased on scene time, but worsened the survival outcome of the patient.

In 2002, Dickinson & Roberts reviewed randomised and quasi-randomised trials of the MAST / PASG identified from the Cochrane Trials Register and various data bases. The study's objectives were to quantify the effect on mortality and morbidity in using the MAST suit for trauma patients. A total of 1075 trauma patients were available for review in this study (excluding extremities fractures). The study found that there was no evidence to suggest that the use of the MAST suit reduced mortality, length of ICU stay or hospital duration time. In fact, the study reported that the MAST suit may actually increase these factors. Both Dickinson & Roberts concurred that the data did not support the continued use of the MAST suit in the trauma situations described.

Future Clinical Protocols

In 1997, Domeier *et al* developed a 'Position Paper' on the use of the MAST suit for the National Association of EMS Physicians. The paper was based on the collective review of the scientific literature by O'Connor and colleagues published in the same year.

The National Association of EMS Physicians reviewed these recommendations and voted to use the MAST suit **only** for adult major blunt trauma with severe hypotension (systolic BP < 50 mmHg) and hypotension associated with unstable pelvic fracture (systolic BP < 90 mmHg).

Conclusion

The overall conclusion that can be drawn from the available research evidence is that the use of the MAST suit in the pre hospital care environment is at best, extremely limited, at worst, clinically outdated and potentially harmful.

* Madigan, V. (2000), 'The MAST suit in pre hospital care – does it have a future? A discussion paper, Australasian Journal of Emergency Care, Vol 7, Number 2, pp 10-15).