



London Ambulance Service **NHS**
NHS Trust

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Mr A Walker
Senior Coroner for the Northern District of Greater London
North London Coroner's Court
29 Wood Street
Barnet
EN5 4BE

Our reference : INQ6806/12

9 December 2013

Dear Mr Walker

Daniel Maurice McMahon : Regulation 28 Report to Prevent Future Deaths

I am writing in reply to the Regulation 28 Report to Prevent Future Deaths dated 21 October 2013, made under paragraph 7, Schedule 5 of the Coroners and Justice Act 2009 and regulations 28 and 29 of the Coroners (Investigations) Regulations 2013, following the inquest into the death of Daniel Maurice McMahon which was heard at North London Coroner's Court between 23 September and 4 October 2013 (inclusive).

The report brings to my attention your concerns following the evidence of the court appointed expert in relation to the use of bilateral needle chest decompressions without a valve. As you will be aware, the LAS had available a senior paramedic prepared and able to give evidence on the issue of needle chest decompressions at the inquest but this witness was not called. The LAS have reviewed the matter and I hope that you find the following explanation helpful:

Purpose of needle chest decompression

Needle Chest Decompression forms an important part of the management of chest trauma in the pre hospital environment by paramedic staff. This procedure has the potential to vent pressure from within the thoracic cavity which may occur where the lung collapses and there is an increasing build up of pressure within the chest. This condition is described as a tension pneumothorax. This condition can ultimately displace the heart, great vessels and neighbouring lung causing progressive respiratory and circulatory collapse with catastrophic consequences if left untreated.

In a permissive environment such as a hospital, formal drainage of the thoracic cavity would be undertaken by inserting a chest drain with an underwater seal in situ. In a patient who is undergoing positive pressure some enhanced pre hospital teams would undertake an open **thoracostomy** to allow drainage of the thoracic cavity under pressure. These are not options that are available for use by the majority of paramedic staff and therefore needle chest decompression has formed the mainstay of treatment for addressing potential tension pneumothoraxes. Warner¹ *et al.* in their 2008 study looking at the safety of needle chest decompression concluded that the use of needle chest decompression appears to be a safe procedure when performed by paramedics in an urban EMS system. In this study pre hospital needle chest compression resulted in four cases of unexpected survival.

Procedure for needle chest decompressions

The classic method of needle chest decompression involves the insertion of a 14 gauge cannula (1.6mm) into the 2nd intercostal space just above the third rib in the mid clavicular line. The needle / trocar is then removed and the plastic cannula left in situ and allowed to vent the chest cavity. This technique is described in both the American College of Surgeons Committee on Trauma Advanced Trauma Life Support Manual² (which is endorsed by the Royal College of Surgeons of England) and in the Pre Hospital Trauma Life Support Manual³. Neither of these seminal texts on the emergency management of trauma recommends the use of a one way valve. The American College of Surgeons Committee, Pre Hospital Trauma Life Support Manual actively discourages the use of one way valve citing that there is a negligible chance of inducing an iatrogenic pneumothorax as the port created by the needle chest decompression is very much smaller in diameter than the trachea which will act as the preferential air passage. It also cites that a makeshift solution of attaching the finger of a medical glove with tip removed, as suggested in evidence by your expert, is likely to be fiddly and delay definitive care. The consensus statement from the Faculty of Pre Hospital Care of the Royal College Surgeons Edinburgh (2007) on the Management of Chest Injuries⁴ makes no mention of the use of one way valves in the section on needle chest decompression.

Conclusion

Both before and after the inquest, this matter has been discussed at some length within the Medical Directorate of the LAS. The Medical Director of the LAS and one of our Senior Paramedics took the opportunity to review our practice with Surgeon Commander Leigh Smith, an extensively published author on needle chest decompression and expert on the management of thoracic trauma, and concluded that the current approach of the LAS (and UK ambulance services) is appropriate in respect of not using one way valves on needle chest decompressions.

¹Keir J. Warner, BS¹, Michael K. Copass, MD² and Eileen M. Bulger, MD¹ Use of Needle Thoracostomy in the Prehospital Environment 2008, Journal of Pre Hospital Emergency Care Vol. 12, No. 2, Pages 162-168

² American College Surgeons, Committee on Trauma. Advanced Trauma Life Support (2012) 9th Edition

³ American College Surgeons, Committee on Trauma. Pre Hospital Trauma Life Support (2011) 7th Edition

⁴ Caroline Lee, Matthew Revell, Keith Porter, Richard Steyn (2007) The pre hospital management of chest injuries: a consensus statement. Faculty of Pre-hospital Care, Royal College of Surgeons of Edinburgh, Emergency Medical Journal 24:220-224. doi: 10.1136/emj

I hope that you will be assured by the consideration the LAS has given to your report, and by the actions taken to investigate the areas you have raised. My Medical Director, Fionna Moore, and I would be happy to meet with you to discuss this further if that would be useful.

Yours sincerely

A handwritten signature in black ink, appearing to read "Ann Radmore". The signature is fluid and cursive, with a large initial 'A' and 'R'.

Ann Radmore
Chief Executive