Medical involvement in prehospital care—a transatlantic comparison

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Abstract

The role of doctors in prehospital care in the United Kingdom and the USA was compared using information obtained from a visit to the City of Houston emergency medical service (Houston, Texas) and from a review of published reports. The involvement of full time specialist emergency medical services physicians has been crucial to the development of improved standards of practice within American prehospital care. The specialty of accident and emergency medicine should support provision of medical advice to the ambulance services by closer liaison with ambulance service trusts and the formalisation of training in prehospital care to specialist registrars.

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The past decade has seen a rapid growth in the medical and organisational sophistication of prehospital care in the United Kingdom. Ambulance services have gained greater managerial control and clinical autonomy by becoming NHS trusts and the influence of doctors in ambulance service trusts has become more remote. Unlike other NHS trusts which have medical directors at trust board level, there is no mandatory requirement upon ambulance service trusts to have medical involvement in their higher decision making processes.

The development of prehospital care in this country has mirrored aspects of the evolution of the American emergency medical services (EMS), although the systems originate from different historical backgrounds. The EMS have passed through a phase where lack of active medical involvement was perceived as resulting in failures of performance, despite the use of more highly trained and better equipped personnel.^{1–4} The medical influence in the EMS is now much stronger and is defined in law.^{5,6} A distinct medical specialty of emergency medical services has evolved, which is the practice of medicine by a doctor delivered through multiple deputies (the paramedics and technicians) in the prehospital setting.²

This paper reviews the role of doctors in prehospital care, comparing British and American practice, and examines areas where increased medical involvement might be of benefit in the United Kingdom. The views expressed are based on my experience in visit-

ing the City of Houston EMS as the Maurice Ellis scholar in 1995.

Background

In the USA, the role of doctors in prehospital care is formalised and often defined in law.⁶ Prehospital providers are not independent practitioners but practise under the license of the medical director of the EMS. In most states there is a requirement that medical responsibility should exist for the actions of paramedics (EMT-P) and in some states this extends to the technicians (EMT-B). For example, in California each EMS must have a medical director to “provide medical control and ensure medical accountability through the planning, implementation and evaluation of the EMS system”.⁵

The importance of physician participation in the development of the EMS was recognised as early as 1966 by the National Academy of Sciences.⁷ Following recognition of emergency medicine as a specialty in 1979, the management of prehospital care was recognised as a function of the emergency physician. However, it was not until 1981 that the first full time EMS medical director was appointed. By 1985 divergence of the new EMS physicians from mainstream emergency medicine and the belief that medical involvement was a necessity for the provision of high quality EMS led to the formation of the National Association of EMS Physicians (NAEMSP).

Trunkey⁸ has identified medical control as one of three essential components of decision making in American prehospital trauma care. The involvement of specialist full time medical directors is now seen as a key element in the development of effective paramedic based emergency medical services.^{2,9,10}

The United Kingdom was the site of some of the earliest initiatives in involving doctors in prehospital care and developing the field provision of advanced life support skills. Collins introduced an accident flying squad in Derby¹¹ and Pantridge and Geddes described a medically staffed mobile intensive care unit for patients with suspected acute myocardial infarction in Belfast in 1966.¹² Medical involvement in prehospital care in the United Kingdom since that time has seen little development and has largely been on a voluntary and informal basis. Advice on a national basis is provided by the Joint Royal Colleges’ ambulance liaison committee (JCALC) to services within England and Wales. A similar but separate mechanism exists in Scotland. The day to day working of the

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United Kingdom ambulance services requires medical involvement, through local ambulance paramedic steering committees (LAPSC) for the training and supervision of paramedics. Paramedics have specific powers in law to undertake the prescription of a limited range of drugs, though their ability to do this and perform invasive procedures is governed by protocols produced by the LAPSC.

Although British doctors are increasingly taking an interest in prehospital care, few are employed in any capacity by ambulance service trusts. However, in recent years medical appointments to board level positions within ambulance service trusts have occurred, most notably in Scotland and Staffordshire, though these still represent a substantial minority. The British Association for Immediate Care (BASICS) provides a focus for the voluntary involvement of doctors in prehospital care, and a multidisciplinary Faculty of Prehospital Care has recently been established under the auspices of the Royal College of Surgeons of Edinburgh.

A more formal and active role in on scene management of trauma by doctors has been investigated by the Helicopter Emergency Medical Service (HEMS) in London. However, assessment of the service has failed to show any overall benefits in terms of survival from trauma.¹³ In view of this inability to show an improvement in outcome among a group of patients selected on the basis that they could benefit from on scene treatment by a doctor, it seems unlikely that there is a role for on scene intervention by a doctor in a modern urban paramedic based system of prehospital care.

Medical control

In the early stages of development of American EMS, patient care was fragmented. The phases of prehospital and hospital care functioned in an isolated and uncoordinated manner. In order to achieve continuity of assessment and management with the introduction of more active on scene interventions, a greater degree of medical involvement was introduced. The City of Houston EMS has documented improvements in patient outcome following the employment of a full time specialist EMS medical director.¹⁰ The service now employs a full time medical director and two associate medical directors to provide medical control. Their involvement in the continuing education of the EMS staff, field supervision, and research has been pivotal in the successful development of the service, which is regarded as a prime example of the benefits of medical control in prehospital care. However, the provision of high quality active medical control remains inconsistent within the United States.

The mechanism for the medical control of prehospital care may be direct or indirect but is usually a combination of the two.

DIRECT MEDICAL CONTROL

Direct medical control implies the provision of instructions to providers in the field at the time of an incident or during transport, and can occur either as a result of the presence of an

EMS physician at the scene or through radio communication between the paramedic and a base station. Direct medical control allows a more flexible and individualised approach to patient care than protocols, but is more time consuming. Because of the volume of work and the relative lack of EMS physicians, radio communication to a doctor working at a base station will remain the commonest mechanism for direct medical control.

The City of Houston EMS base station was within the emergency department of Ben Taub General Hospital, and the role of base station physician was taken by the resident doctor for the relevant specialties. These doctors were generally junior and had no experience of prehospital care or the difficulties of field assessment and management of patients. Messages were relayed from the paramedics to the base station physician by a third person, with the inevitable potential for inaccuracy and delay. Direct paramedic to physician communication was a rarity in the system. This procedure was recognised as unsatisfactory by the staff of the City of Houston EMS.

Nationwide, other systems are able to provide base station physicians with emergency medicine and EMS experience in direct communication with their paramedics. Recommendations for the formal training and certification of physicians to provide direct medical control include an understanding of the system design, with experience in prehospital care and radio procedures.¹⁴ A programme of audit of the base station physicians' performance is also desirable to identify errors and deviations from approved protocols.¹⁵

The involvement of physicians in the field supervision of prehospital providers has been proposed as a major factor in the successful development of the most advanced American urban EMS systems such as the one at Houston. The appearance of EMS physicians in the field gives a physical presence to the authority of the medical director and allows opportunities for education, quality assurance, and the development of research.⁶ The role of the doctor in the care of the patient is not as important in these circumstances as the ability to stand back, monitor performance, and provide constructive criticism with the aim of producing improvements in clinical behaviour among the paramedics.^{6,16}

INDIRECT MEDICAL CONTROL

This covers all aspects of medical control other than the direct involvement of the physician at the time of patient contact. The provision of indirect medical control recognises the impracticality of a small number of EMS physicians being involved in some form of contact with the prehospital providers during each patient episode.

Control of patient care is provided largely through the medium of protocols which are produced by the medical director or his delegates. Protocols provide a predetermined regime of assessment and management which can be initiated by the paramedic under the authority of the medical director without direct

reference to a physician. Similarly, protocols may be produced to control triage and determine the appropriate receiving hospitals for patients.

Indirect medical control also encompasses administrative and operational matters not directly related to patient care, such as system design, dispatch, equipment, training, and quality assurance.

Evaluation and monitoring of the structure, process, and outcome of the EMS is vital to the detection and correction of areas of underperformance, both on an individual and on a system-wide basis. The medical director of the service has a responsibility to evaluate the care being provided by paramedics under his licence and maintain his own high standards of care among the service providers. Review of prehospital report forms allows assessment of diagnosis, appropriateness of field procedures, delays, and disposal.² Access to meaningful information on clinical outcome and expert interpretation of this information allows completion of an educational circle for the paramedic which, if delivered appropriately, allows an improvement in clinical performance.¹⁶ This has until recently been virtually absent in United Kingdom ambulance services, and has resulted in difficulties for motivated paramedics seeking to improve their clinical performance by obtaining feedback on their actions. Statistics on structure and process of care are more widely available in the United Kingdom and, while valued by the Department of Health, are of less importance and relevance to clinical care.

In Houston the process of initial education of paramedics was carried out in colleges independently of the EMS. A standard paramedic curriculum and assessment is approved by the US Department of Transport and is often modified, both in state law and locally. As a result of the requirement for a paramedic to practise under the license of a medical director, a further level of assessment of initial and continuing competence is often imposed by the medical director of the system. Continuing education is given high priority both in the formal classroom and field setting.⁵ Regular compulsory courses of continuing education are provided, supplemented by additional education for any paramedics whose performance has been identified as unsatisfactory.

Paramedic training in the United Kingdom has a national core curriculum with prescribed minimum periods of re-education and assessment. These, however, amount to only one day per year and a five day course every three years, and in the absence of other forms of continuing education they are sparse in comparison with what is available for other health care professionals. The retention of psychomotor skills requires regular reinforcement to prevent deterioration. In all-paramedic systems, as in the United Kingdom, opportunities for an individual to employ advanced life support skills in the field will be limited and without a compensatory education programme, skills and their application in the field will deteriorate.

Research

As in other areas of practice, medical care provided to patients before reaching hospital should be subjected to scientific examination to determine its effectiveness. Until recently evidence for the effectiveness of prehospital interventions was largely inappropriately extrapolated directly from hospital based research. Complex systems were supported by hope rather than by proof of efficacy.¹⁷ Research in prehospital care has many inherent difficulties, but these are not insurmountable and with appropriate organisation reliable scientific methods can be applied at the scene of injury or illness. The City of Houston EMS had completed randomised controlled trials examining fluid replacement in trauma¹⁸ and the use of the MAST suit,¹⁹ which had altered their practice. Other research had allowed the development of criteria for the prehospital termination of cardiac resuscitation²⁰ and evaluated the use of high dose adrenaline in cardiac arrest.²¹

The experience and knowledge of scientific method necessary to carry out meaningful research in prehospital care is rarely present within a United Kingdom ambulance service. In an effort to encourage research activity, financial support for prehospital research has recently been made available through JCALC. However, the success of any research is reliant on the paramedics who will collect data and perform interventions. Medical involvement can provide the leadership in research necessary to establish a scientific basis for the practice of prehospital care.

Discussion

The provision of prehospital care in the United Kingdom is evolving rapidly. For patients, a smooth transition from prehospital to hospital care in the accident and emergency department is essential for accurate assessment and appropriate treatment. Doctors working in accident and emergency departments therefore have a responsibility to be involved in prehospital care and in liaison with the ambulance services. This paper has identified a number of areas in which more formal involvement of doctors with the ambulance services might produce benefits.

American experience has shown that more active medical involvement in prehospital care can produce demonstrable benefits, though many aspects of American medical control of prehospital care are undesirable and inapplicable to the ambulance services in this country. An increased level of medical involvement may, however, produce benefits in the continued development of advanced life support skills in the field, quality assurance, education and research. There is at present no recognised training scheme or defined role for doctors within the ambulance services. The American EMS physician evolved from the specialty of emergency medicine. As the medical point of contact for the ambulance service in this country, accident and emergency medicine should consider similar developments.

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