Chapter 12
The Ambulance Service of the Future

Mark Docherty, Andrew Carson and Matthew Ward

Context and Background: The Case for Change

Around the world, services for urgent and emergency healthcare needs are becoming busier, and the risk is that the current configuration of services will become unsustainable in years to come if services do not change radically. There are a number of reasons why current demand is outstripping the supply of services:

- The demographics of the population are changing, with an increasingly elderly population living with complex health needs and multiple long-term conditions. This population is also responsible for a shift in most developed countries with regard to the demographic of major trauma that has historically been dominated by young adult males and which is now seeing a shift towards falls in over 65-year-olds being the main source of major trauma cases.
- A younger generation of consumerists, who are used to an internet world of immediate response, rising expectations and a desire to see services delivered in a more convenient way.
- We have a significant global recession, where funding for health care just will not keep up with demand that is delivered as 'more of the same'.
- There is a national shortfall in the workforce of nurses, general practitioners (GPs), hospital emergency department (ED) doctors, paramedics and a whole

M. Docherty (✉) · A. Carson · M. Ward
West Midlands Ambulance Service NHS Foundation Trust, Millennium Point, Waterfront Way, Brierley Hill, Dudley, West Midlands DY5 1LX, UK
e-mail: mark@docherty.info

A. Carson
e-mail: Andrew.carson@wmas.nhs.uk

M. Ward
e-mail: matthew.ward@wmas.nhs.uk

P. Wankhade, K. Mackway-Jones (eds.), *Ambulance Services,*
DOI 10.1007/978-3-319-18642-9_12

range of other allied health professionals. Even if financial resources were not scarce, there simply is not the number of healthcare professionals available to deliver care in the same way going forward.
- We have a confused, urgent and emergency care system. There is an inconsistent way in which care is delivered in different settings. Accident and emergency departments are sometimes called EDs, but the care offered at each may differ. The range of services varies even more between different care settings that call themselves minor injury units (MIUs), and there is also an array of other services, such as immediate care centres, health centres, walk-in centres and many other terms that mean that the public simply get confused as to where they should go.
- People simply choose the place to go depending on what is easiest and provides the convenience that is desired. As a result of this, ambulance services and hospital EDs often become the default choice as these services are available 24 h a day, and they have therefore become a victim of their own success.

The National Health Services' (NHS) urgent and emergency care services provide life-saving care. The current system is under increasing pressure and NHS England wants to improve the urgent and emergency care system so patients get safe and effective care whenever they need it.

In January 2013, the NHS Medical Director Professor Sir Bruce Keogh announced a comprehensive review of the NHS urgent and emergency care system in England. A review of the implementation of the review's findings suggested that collaboration and integration were key themes in the system change and that there is no national one-size-fits-all approach.

The vision presented by the Keogh review is clear: For people with urgent needs that are not life-threatening, a local responsive service in the pre-hospital environment is a priority. Where people are found to have serious or life-threatening needs, then treatment in centralised centres with high expertise and good infrastructure will maximise good clinical outcomes. This vision is demonstrated visually (Fig. 12.1, cited in Keogh (2013)).

In the event of an unplanned care need, a person has two routes into care services; a nonemergency route via a national 111 call number connects a patient to a call taker who, via an algorithm, assesses the patient's health needs and signposts them to the most appropriate service for their needs locally or, if necessary, dispatches an ambulance for the person to have further assessment.

This strategy is also founded on five clinical priorities:

1. Giving people the skills and confidence to self-care
2. Ensuring that people get the right care in the right place first time
3. Ensuring that appropriate services are available for people to use outside of hospital
4. Connecting urgent and emergency services together and ensuring they work as a system rather than different parts
5. Where people need specialist emergency care, ensuring this is provided in centres that have the right expertise and equipment

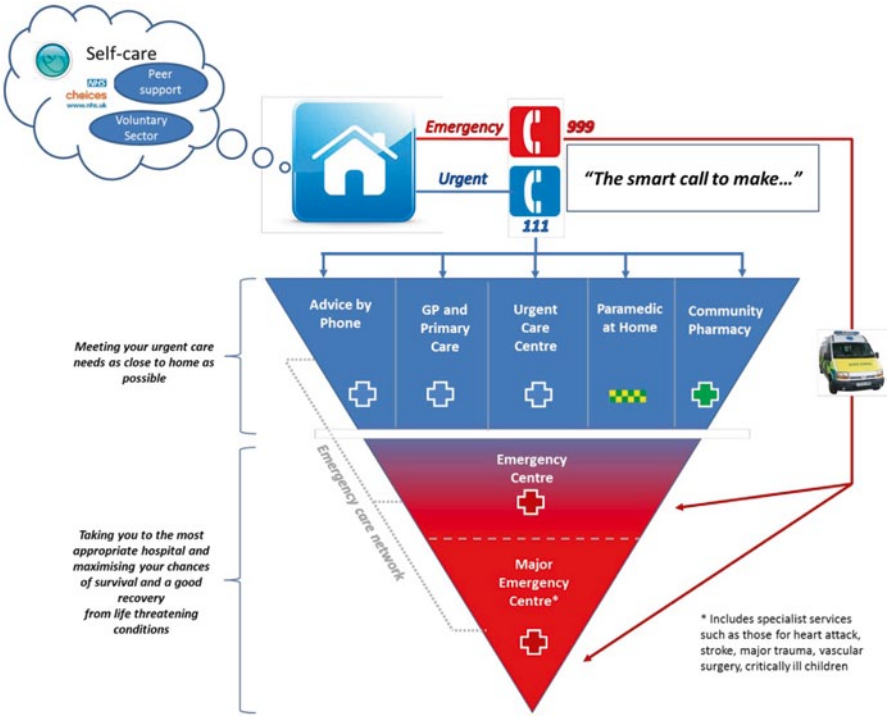

Fig. 12.1 The proposed look and design of the new system. (Keogh Review 2013, p. 23)

The Keogh review (2013) identified that:

> By extending paramedic training and skills, and supporting them with GPs and specialists, we will develop our 999 ambulances into mobile urgent treatment services capable of dealing with more people at scene, and avoiding unnecessary journeys to hospital.

In 2014–2015, England saw the number of emergency ambulance 999 calls reach ten million, meaning that a person will call 999 on average every 5 or 6 years, so it is unlikely that we will ever be in a position to educate the public properly about how to use an ambulance service. What we need to design is a service that can respond appropriately to a person's request for assistance irrespective of the need. This means that in future, ambulance services will need a greater repertoire of response models that are either provided or available to ambulance staff.

Specialist Centres for Emergency Care

Local general hospitals have traditionally offered a range of diagnostic and treatment options for most conditions, but increasingly some services are being concentrated in more specialised centres. The treatment for a heart attack, for example has changed from 40 years ago, when bed rest was the treatment of choice (with a 25% in hospital mortality) to the modern treatment of mechanically unblocking the coro-

nary artery, which produces a much better clinical outcome and reduced mortality. Major traumas, hyper-acute stroke services and vascular and neonatal services are other examples of services that have gone or are undergoing reconfiguration.

Increasingly, therefore, we will see more services developed in specialist emergency centres, which will be fewer in number, and therefore ambulance clinicians will be required to deliver a wider cadre of skills, including diagnostic and treatment to ensure that patients are taken to the centre that can most effectively deal with the condition that the patient presents with (Berwick 2013).

The implications of this must continue to be approached at the level of the whole health economy, with intelligent commissioning decisions being taken to focus on the best outcomes for patients through appropriate alternative care pathways that are underpinned by a clear infrastructure of primary care services, including GP services, walk-in centres, MIUs, district nursing services and well-established links with social care. All of this needs to be available 7 days a week to support the higher level urgent and emergency services, such as EDs, to avoid the latter being overwhelmed by conditions that could be managed more simply in a setting more local and more clinically appropriate to the patient.

Implications for Ambulance Services

Ambulance services are in the front line of this rising tide of urgent and emergency care activity and ambulance clinicians find themselves acting as gatekeepers to pathways that are most appropriate for the patient in front of them. Commissioners have tended to focus on the importance of reducing conveyance rates to EDs, but this has not always been matched by the funding required to support the development of alternative pathways that improve the outcome for patients. If patient safety, clinical effectiveness and patient experience are to guide the direction of travel for commissioners and the wider health economy, then the focus must be on *safer care, closer to home* and a realisation for clinicians and patients that *home is normal*. Simply concentrating on reducing conveyance rates carries the potential to create huge risks for patients from a clinical perspective.

A further issue for the ambulance sector is that the traditional training for paramedics and other frontline clinicians has been to take the well-established airway, breathing and circulation (ABC) approach as the basis for their clinical assessment. As ambulance trusts move into the new world of assessing patients and accessing newly developed patient pathways via the developing infrastructure of more appropriate local services, they will need to develop the skills to undertake a rapid, safe and effective assessment, once they have assured themselves that a patient does not need to be conveyed urgently to an emergency care facility (National Audit Office 2010). This might take the form of a more traditional medical model approach to history taking and systemic examination or another alternative would be the paramedic pathfinder, a model based on the Manchester Triage Tool and adapted as a series of algorithms to enable a rapid face-to-face assessment of a patient, aiding the

decision of which alternative pathway to use. The importance with the paramedic pathfinder approach is the need for this to be supported by the infrastructure of more local services as alternatives to the ED. The inevitable effect of a more involved face-to-face patient assessment is the potential impact for:

- Increasing on-scene times and, therefore, overall job-cycle times, reducing logistical efficiency and the impact on time measures performance standards
- Increased requirement for clinical supervision in order to support the widening of the scope of practice being required by ambulance clinicians
- Increasing the amount of equipment for diagnosis and treatment required
- Increasing the requirement for drugs and the management and legislation surrounding prescribers and nonprescribers

Clinical, human resource (HR) and operational colleagues will need to work together to minimise the potentially disruptive impact of these elements on a system already facing huge operational pressures.

The Digital Patient Record and Integration with the Wider Health Economy

In the UK, many ambulance trusts still use a paper Patient Report Form (PRF), whilst a recent nationally driven initiative to develop an electronic patient record is currently being wound up. New systems are currently being developed but there are a few key principles to be considered.

- A digital patient record should not attempt to be an electronic version of the PRF as this would miss huge opportunities for enhancing patient care.
- Frontline staff should be able to see clear advantages in the delivery of care to their patients' on-scene so that compliance with and use of the digital record is maximised.
- The system should include live recording of data from monitors, such as ECG, oximetry, capnography, temperature, etc. This will produce a far richer source of information for each patient that is live data, enabling far timelier reporting of clinical metrics to triangulate more meaningfully with operational, HR and finance metrics within the organisation.
- Information from previous contacts with the ambulance service should be available via the system, enabling pre-population of key fields such as past medical history, allergies and medication. This should save on-scene time.
- Every effort should be made to match the case to NHS number, bringing the ambulance services into line with the rest of the NHS in using this as the primary identifier for each patient. This will enable access to the summary care record, where available, giving up-to-date information about current medication, allergies and key diagnoses that can be compared with the historical record and giving further opportunities for reducing on-scene time. Another advantage of

using the NHS number would be the potential for accessing better outcome data for individual patients.

- Development teams should liaise with local initiatives in their areas that are currently working to produce shared health and social care records, giving the potential for access to patient care plans, details of key workers etc.
- Each face-to-face contact should result in an appropriate report to the patient's GP and other interested parties, such as safeguarding referrals, referrals to community diabetic teams, etc., thus enabling easy identification of higher volume service users by GPs, as well as reducing the time taken on-scene to make direct referrals by telephone.
- The system should be able to link with hospital patient administration systems (PAS) for pre-alerting; possibly generating SMS texts to primary percutaneous coronary intervention (PPCI) teams so that ST-elevation myocardial infarction (STEMI) patients, for example can be conveyed directly to the PPCI suite or Face Arm Speech Test (FAST)-positive stroke patients could be conveyed directly to CT.
- Systems with video capability could, with clear policies around maintenance of confidentiality, be used to stream images to the trauma desk for specialist advice, stream video to secondary care colleagues to bring consultants into the home remotely for advice around the need to convey or use of alternative pathways.
- A video function could also allow crews to contribute remotely to morbidity and mortality meetings for cases that they have been involved in, enhancing their own personal development.
- Consistent coding is of the utmost importance when considering benchmarking, both within the organization and comparing with historical performance, as well as comparing with other trusts. A well-recognized coding system, such as SNOMED CT®, should be used and code sets should be agreed nationally, with data entry streamlined through appropriate use of templates. Rapid assessment using the Paramedic Pathfinder or Medical Model could be adapted for data to be entered via templates. Data entry should be flexible, so that patient care is not interfered with but there should be an ability to complete data entry after handover.
- Consistent coding should enable more detailed analysis of clinical performance in individual cases, as well as groups of cases such as STEMI patients, diabetic hypos etc. Audit departments should have good reporting systems to provide timely information to the board level for triangulation with other metrics in the organisation.
- Individual clinicians should be able to review their cases for reflective practice, enhancing opportunities for personal development, as well as comparison with peers (clearly this would need to be done in a nonthreatening way to avoid any negative impact on individual clinicians).

- The system should link to other resources, such as British National Formulary (BNF), TOXBASE®, Directory of Services, UK Ambulance Service Clinical and Practice Guidelines, enabling crews to access relevant information rapidly with regard to the patient they are treating. Links to prescribing software such as BNF should promote safer treatment by paramedics on-scene, reducing the risk of allergic reactions or drug interactions.
- With the current trend towards far more patient-focused care, post Francis report and Berwick review, software packages are currently under development for use by patients themselves (e.g. Health Fabric) that enable patients to link to their GP and hospital records, as well as helping patients to develop their own personalized care plans. If ambulance systems are to be future proofed, then they should be able to link in with these packages as well, where patients allow, so that a patient's own views can be seen and taken into consideration. This, along with telemetry and remote monitoring of high-risk patients, will mean the ambulance service will have a role in preventative and anticipatory urgent and emergency care.

Conclusion

With the rising tide of activity levels, changing demographics, service reconfigurations and changing patterns of urgent and emergency care provision, it is vital that a health economy-wide approach is adopted by all parties to develop clear patient pathways locally. The focus for ambulance trusts must be safer care, closer to home and not merely reducing conveyance rates (House of Commons Health Committee 2013; Keogh Report 2013). This will involve intelligent commissioning and collaboration between health and social care across the entire health economy. Simply doing much more of the same is not a long-term solution and often has a direct impact on issues such as the delivery of mandatory training and personal development reviews, which are key features that underpin any sustainable change within any modern, learning organization.

Such change within ambulance trusts can only be achieved through good communication across all directorates at board level, with a recognition that everyone is working towards the same goal of providing the best possible care to every patient having contact with the service. In addition to good internal communication across all directorates and throughout all levels of the organization, from board to front line and back, effective communication must be fostered between partner health and social care organizations across the health economy. The digital patient record and integration with the wider NHS is likely to be one of the most crucial cultural developments for the future.

References

Berwick, D. (2013). *A promise to learn—A commitment to act: improving the safety of patients in England*. London: Department of Health.

House of Commons Health Committee. (2013). *Urgent and emergency services second report of session 2013–2014*. London: The Stationery Office Limited.

Keogh, B. (2013). *Transforming urgent and emergency care services in England. Urgent and emergency care review, end of phase 1 report*. London: NHS England.

National Audit Office. (2010). *Major trauma care in England*. London: The Stationery Office.

Mark Docherty is the director of Nursing, Quality and Clinical Commissioning for West Midlands Ambulance Service NHS Foundation Trust. West Midlands Ambulance Service NHS Foundation Trust serves a population of 5.36 million people covering an area of more than 5000 square miles in the heart of England, and as the region's emergency ambulance service responds to around 3000 '999' calls each day. Mark has previously been the ambulance commissioner for London Ambulance Service, and in 2013 gave evidence to the House of Commons Health Committee on urgent care that led to the Urgent and Emergency Services Second Report (2013).

Dr Andrew Carson is the Medical Director for West Midlands Ambulance Service NHS Foundation Trust. Dr Carson has been a General Practitioner (GP) at a Medical Centre in Birmingham UK for 26 years. He is also an Associate Dean for GP Training for the Workforce Deanery in the West Midlands where he has been heavily involved in the training of GPs for around 15 years. He has also been a Clinical Director for an Urgent Care Centre. Dr Carson is a Fellow of the Royal College of General Practitioners and has a strong track record for innovative and strategic thinking. He has been involved in a number of research projects that have resulted in papers being published in the medical press.

Matthew Ward is a consultant paramedic working for West Midlands Ambulance Service NHS Foundation Trust. Matt has been a paramedic for 15 years, and specialises in emergency care. He was the head of Cardiac and Stroke Management for West Midlands Ambulance Service NHS Foundation Trust and was responsible for implementing a number of successful changes to clinical guidelines and pathways for cardiac, stroke and resuscitation care. He chaired the NHS Midlands and East Stroke Review during which he lead on the modelling of the new Hyper Acute Stroke Units and more recently also chaired the Birmingham and Black Country Stroke Review.