Prehospital management of the acutely ill child

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The face of primary care is changing fast

The delivery of unscheduled care outside hospital is hugely different from even 5 years ago, with a government initiative of taking the care to the patient^{1,2} rather than the opposite. The organisation of emergency care for children (and adults) outside hospital and the professionals involved has changed considerably, so the experience an ill child and family may have nowadays may be quite different from "seeing your own doctor".

THE ENVIRONMENT

The difficulties of the prehospital environment in an acute emergency setting are diverse and have been described elsewhere.³ Most ill children, however, (as opposed to injured children) will at least be examined in a relatively controlled environment, although siblings, washing machines, televisions, and large dogs mean that a gentle "command and control" attitude may have to be exerted on arrival. Lighting may be remarkably poor even inside a house, sometimes removing the capability to assess the child's colour. Although most general practitioners and others required to attend ill children will encourage surgery attendance to obviate such problems, this is often deemed impossible by carers (particularly to out of hours services), for a variety of logistical reasons. Out of hours, it is also unlikely that whoever attends an ill child will have any access to the patient's notes and, once pharmacies are closed, prescribing options are limited. Equipment carried for children by the ambulance service, the GP, and out of hours services will reflect their perceived roles, but in all cases may be relatively lacking compared with hospital—for example, pulse oximetry is still in its infancy in general practice.⁴ Some GPs still do not carry oxygen. The equipment and procedures available to children from the ambulance services vary widely from service to service.⁵

OVERALL CONSIDERATIONS OF THE NEW STRUCTURE

The new contract for GPs that has fallen out of the NHS plan^{1,6} has changed the

face of primary care. The contract, allowing GPs to opt out of providing care outside the hours of 08.00–18.30 Monday to Friday,⁶ has led to the development of various "out of hours" organisations to replace the old GP on call arrangements. Primary care trusts (PCTs) have the responsibility for either directly arranging the service or commissioning it from others such as ambulance services or private GP organisations. Quality standards relating to these services have been published⁷ but mainly reflect operational performance such as response times to calls for assistance rather than quality of care—although one indicator does require clinical audit of about 1% of calls, by "a clinician experienced in out of hours care". Other documents such as "Reforming Emergency Care"⁸ have encouraged a rethinking of patient care pathways, designed to lessen the burden of emergency departments and office GPs. The telephone triage of NHS Direct is an example of this, although the triage system of NHS Direct is conservative and there has in fact been no significant effect on the emergency services' workload.⁹ Walk in centres (independent NHS clinics or surgeries where patients can present without an appointment), particularly in towns, and minor injuries units in more rural areas are sometimes nurse led, providing immediate access to care, but the available experience in identifying and treating children may vary widely. The reorganisation of healthcare has also required the development of new breeds of healthcare professionals.

SO WHO WILL SEE ILL CHILDREN NOW?

General practitioners

GPs see many children (more than some consultant paediatricians in a day) and most develop a very good sense of the ill versus the well child. The time allocated to consultations is usually 10 minutes or less in normal surgeries—including writing notes, reviewing results, phoning the hospital, and so on, which is often inadequate to address all the assessment, management, parental

concerns, and education required to treat an acutely ill child. Although most GPs have learned about ill children "on the job" over the years, there are now numbers of experienced paediatricians with MRCPCH working in primary care. It is very stressful to work without the support of a well equipped ward, instant availability to investigations, and the opportunity to observe the child for even a few hours. Ill children are likely to see a GP if they present during office hours, and still often see one out of hours—though this may become less common, as more emergency care practitioners (ECPs) (see below) become available. Despite the excellent management most GPs afford their little patients during less serious acute illness, their confidence when dealing with a potentially *seriously* ill child may not always be so good. A recent study undertaken of GPs' attitudes to the prehospital management of possible meningitis in children carries a worrying insight into the exposure and uncertainty some GPs feel.¹⁰ Paediatrics has never been a required subject of vocational training schemes, so it remains to be seen how the new models of medical training affect competency in primary care paediatrics.

Out of hours GPs are in short supply and are thus usually paid well—this has meant that in some areas doctors from other countries, unfamiliar with the NHS, are flying in for, say, a weekend shift then going home again. Like any GP, they may or may not have paediatric experience.

The removal of out of hours responsibilities from mainstream general practice will also dilute the daytime GP's experience in dealing with acutely ill children, many of whom will present in the evening. Finally, the new GMS contract,⁶ which offers incentive payments for good management of certain conditions, is stacked against children, with most incentives being adult oriented (coronary heart disease and stroke) and groups of children actually excluded from some good practice markers (epilepsy and asthma for example). This lack of focus on children's care may have an adverse effect on children in general practice and is already causing concern among GPs interested in children.

The ambulance service

The UK ambulance services has four levels of ambulance response, and two important changes have taken place in the last two years. Table 1 summarises the different responses and call prioritisations.

In April 2004, it was decided by the Department of Health that children under the age of 2 (who used to be automatically made a category A response) were to be triaged with all

Table 1 "Front line" ambulance response categories

Category of response	Definition	Time to scene (national requirement)	Resource
A	Provision of treatment in under 8 minutes may save life or significantly improve outcome	Under 8 minutes	Front line ambulance staff attendance; may initially be a "first responder" volunteer (unusual to be called if a child the patient)
B	Provision of treatment in under 19 (14) minutes may save life or significantly improve outcome	Under 19 minutes (rural), under 14 minutes (urban)	As for A. First responders not used by some services
C	Anything other than A or B or "GP urgent"	No requirement to attend with an ambulance service response	This is left up to the ambulance service and may vary from providing an ambulance, through telephone advice, to putting the call through to "out of hours"; some will still require an ambulance by their nature, even though not life threatening
"GP urgent"	A call from a GP that demands an unscheduled response that day (that is, is not a journey planned in advance)	Decided between ambulance service and GP	Frequent confusion arises because of ambulance use of word "Urgent"; in this context it may be anything from an 8 minute response to some hours, as agreed with the GP, though ambulance services may sometimes respond more rapidly than requested

other patients. It is clearly unfair to provide a category A (table 1) response to a panicking mother whose toddler has cut its finger, at the expense of a 3 year old with life threatening asthma, septic shock, or status epilepticus. The outcomes of the illness definitions within the internal categories of the triage system which categorise the calls that have been identified as potentially high risk for small children and babies, such as "sick person—no specific diagnosis", are being carefully audited.

From October 2004, the Department of Health also decided that category C calls did not require ambulance attendance. The disposition of these calls is now up to the local ambulance service. Services have dealt with this in many ways, from sending an ambulance, through referring the call to out of hours services or the GP, to merely phoning the patient back within an hour. Some services are now using ECPs in some cases. Ambulance services are required to audit their arrangements.

Finally in July 2005, the Department of Health paper "Taking Healthcare to the Patient – Transforming NHS Ambulance services"² emphasised the increasing role that is planned for the ambulance service in providing unscheduled care in addition to emergency care. The vision is that ambulance services will provide increasing ranges of other services integrating into primary care, diagnostics, and health promotion and increasing the availability of mobile healthcare. This is very exciting for children as they now have a much greater potential for being treated at home (for example, if suturing is needed), but the risks are also obvious. The initiative will need great support from paediatricians in working with the ambulance service to ensure this is safe and works well for acutely ill children.

The front line ambulance service is always a fallback position. There are two

types of front line staff, paramedics and emergency medical technicians (EMTs). Paramedic training in paediatrics only became obligatory in 2001 and training is still not required for EMTs. (999 ambulances are sometimes staffed by two EMTs). Table 2 illustrates likely management abilities between an EMT and a paramedic in managing a very ill child.

Skills permitted for paramedics and technicians are variable across services despite the availability of national guidelines.¹¹ A study done in 2003 showed one service which did not use adrenaline for anaphylaxis in children and some only provided pulse oximetry in adults. More services allowed paramedics to use intravenous dextrose than

oral glucose gel for hypoglycaemia. This suggests an underlying lack of understanding of paediatric acute illness.⁵

Frontline staff rarely have to use these skills when transporting children, and it has been estimated that less than one intubation would be done per 100 paramedics per year in a child by paramedics in the USA.¹² Although paramedics have slightly different roles in the USA, it may be even less in the United Kingdom, as UK paramedics are not trained to anaesthetise children, limiting their opportunity to undertake the skill. Pain control is a problem because paramedics are not experienced at cannulating small children, meaning that, although allowed, they cannot

Table 2 Comparison of some skills of a paramedic and emergency medical technician that might be used in managing a seriously ill child

Skill	Paramedic	Emergency medical technician
Recognition of seriously ill child	✓	×
Basic life support child/infant/neonate	✓	✓
Advanced life support	✓	×
Monitoring—pulse oximetry/Glasgow coma score/pain scoring	✓	✓
ECG interpretation	✓	×
Manual/Guedel airway	✓	✓
Oxygen delivery	✓	✓
Bag valve mask ventilation	✓	✓
Administration of nebulised salbutamol/ipatropium	✓	✓
Laryngeal mask airway	✓	✓ (some can)
Endotracheal intubation	✓	×
Needle cricothyroidotomy	✓	×
Needle chest decompression	✓	×
Vascular access—venous/intraosseous	✓	×
Blood sugar estimation	✓	✓
Intramuscular adrenaline for anaphylaxis	✓	✓
Glucose gel administration	✓	✓
Intravenous saline	✓	×
10% glucose	✓	×
Benzyl penicillin administration	✓	×
Rectal diazepam administration	✓	× †
Intravenous morphine	✓	×
Recognise life extinct	✓	✓

This is not an exhaustive list of skills and competencies and competencies vary from ambulance service to ambulance service. Some of these skills may be used very rarely or never in a paramedic's career.

†Emergency medical technicians can administer patient's own supply but cannot supply diazepam. Paramedics can supply and administer diazepam.

Table 3 Potential roles for emergency care practitioners

- Attending suitable ambulance calls to avoid hospital admission if they can be treated by at home – may include category A or B, as well as C calls
- Assisting front line ambulance staff in responding to emergency calls
- Telephone triage in ambulance control
- Telephone triage in out of hours centre
- Doing clinics in out of hours centres
- Seeing and assessing patients at home as part of out of hours arrangements, with indirect supervision by GP over a number of ECPs
- Working in minor injuries units
- Working in conjunction with GPs in GP surgeries – for example, doing urgent assessments and visits

ECP, emergency care practitioner.

easily administer intravenous morphine. The difficulties of training paramedics and skill retention are described elsewhere.¹³ The mainstay of teaching all ambulance staff is the recognition of the seriously ill child and using aides memoire and so on, while encouraging skills with good retention to help them when dealing with such patients.¹³

Emergency care practitioners

This new speciality is an extended role for either nurses or paramedics, but the great majority of ECPs at the present time are from a paramedic background. The role of ECPs is well described in the Modernisation Agency/Department of Health document "The emergency care practitioner report—right skill, right time, right place".¹⁴ It is still unclear exactly where ECPs will finally fit in but it is likely that they will have a variety of roles such as those in table 3.

Clearly, ECPs are very likely to become the primary encounter for the ill child and it is crucial that paediatricians ensure they are competent in the acute care of both seriously ill and less seriously ill children. It is worrying that there is still no defined educational programme for ECPs, though general competencies are defined.¹⁴ These competencies are enormous, in places resembling those of a doctor, and yet most training takes only around six months (some courses are even shorter, a few longer). There is no guidance regarding paediatric training, and clinical attachments are not required in paediatric departments. The video "spotting the sick child"¹⁵ is useful for ECPs, ambulance staff, and GPs alike, but was not designed for ECP training.

If paediatricians are to prevent disasters occurring or (more likely) many extra children being sent to hospital for assessment, it is essential that they involve themselves with the local ambulance service ECP training programme at an early stage and make sure it is suitable for children. It is suggested that paediatricians would be best contacting the medical director of their local ambulance service or the heads of primary care in their local PCTs to ascertain the local situation. Hopefully those involved will appreciate offers of assistance in training and in monitoring the standards of quality and care that children now (or will) receive in this new system.

TELEPHONE TRIAGE STAFF

In a typical out of hours service, there will be one or more nurses or, less often, paramedic advisors who triage, using computer advice systems. They provide initial advice to all calls and direct the patient to the most appropriate service—ranging from district nurses through the on call "out of hours" GP (who may or may not choose to see the child), to dialling 999.

Telephone triage healthcare professionals (including NHS Direct) and nurse and paramedic ECPs may in the future form the backbone of the unscheduled care service, and good paediatric knowledge will be essential.

SUMMARY

Prehospital care for children is developing fast, but the backdrop on which it is doing so is changing even faster. Opportunities for allowing good care at home now exist which must be encouraged. It is important that paediatricians

involve themselves in the new prehospital plans for emergency care, to ensure that children as well as adults will ultimately receive a safe, better quality care, centred round their needs.

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