Primary care provision of specialist services

THE General Medical Services Committee of the British Medical Association (BMA) has recently issued advice to general practitioners (GPs) on how to apply for and obtain National Health Service (NHS) contracts to deliver specialist services such as vasectomy and endoscopy.[1] Recent guidance from the NHS Executive removes most of the restrictions that currently limit the range of specialist procedures that GPs may offer and obtain NHS payment for.[2] But what are the likely benefits of a greater degree of specialist provision within primary care to patients or practitioners, and how does this fit in with the traditional role of the GP as generalist and gatekeeper to secondary and tertiary care services?

The ideal of the generalist, concerned with whole-person medicine, has been fundamental to general practice,[2] but the future may see an increasing number of GPs explicitly developing special interests. The capacity to make internal specialist referrals within a group practice has been proposed as one way of avoiding unnecessary hospital referrals.[3] It has been suggested that some fundholding practices could become like small NHS provider trusts, operating within their own 'mini health service'.[4]

Defining the boundary between extended primary care and specialist care is not a simple matter, and varies between different countries; for example, in the Americas, general internists and general paediatricians are regarded as being part of the primary care team.[5] For some specific surgical procedures the distinction is fairly straightforward. Minor surgery is now a standard feature in many general practices. Flexible sigmoidoscopy is not commonly carried out in general practice, but probably could be with appropriate training and equipment,[6] while colonoscopy or upper gastrointestinal tract endoscopy, which requires sedation, may be better performed in hospital.[7] Specialist assessment and advice of the sort that consultants provide at an outpatient clinic will be the most difficult area in which to judge when a GP is offering something that is clearly outside the normal scope of general practice.

An increasing proportion of specialist services are now delivered through outreach clinics where a consultant or other hospital specialist offers a session located on practice premises. These have become rapidly abundant over the past few years and are popular with GPs, especially with fundholding practices. The potential benefits include easier access for patients, improved communication between the GP and the specialist, and educational opportunities for both GP and specialist.[8] There are concerns that the burden of travelling time for hospital-based consultants may be a limiting factor, and that most outreach services operate as 'shifted outpatient clinics'[9] when a GP is not in attendance, offering little opportunity for mutual learning.

Many GPs themselves have current or recent experience of practice in a hospital specialty — in 1992, some 28% of GPs held clinical assistant appointments at a hospital specialist clinic.[10] In the hospital clinic, the GP working as a clinical assistant may be providing specialist assessment and opinions on the patients of other GPs under the nominal supervision of a hospital consultant. It seems logical, therefore, that a GP whose specialist experience is acceptable for a hospital-based clinic should also be able to deliver the same service on an outreach basis in practice premises. A local hospital clinician is likely to be the person in the appropriate specialty who is best placed to advise the local health authority whether an individual GP has the necessary skills and experience to provide a specialist service. But this will demand that the hospital clinician is able to exercise professional judgement free of market pressure to view the GP as a potential competitor in the provision of specialist care. With the GP acting as the specialist in such a clinic, some of its advantages could be achieved without the penalty of imposing heavy travelling commitments on a hospital-based specialist. To preserve opportunities for education and clinical audit, good working links between the specialist GP and the hospital-based consultant would be required. Also, we still do not know much about what patients think of existing consultant outreach clinics, and it would certainly be important to establish how they would view their own GP acting as both generalist and specialist.

Current NHS specialist referral systems rely on the GP taking an objective view of the need for specialist referral in the first place, and maintaining a healthy scepticism on the need for continued follow-up. This gatekeeper function of general practice has been argued as being essential to the health benefits that good primary care brings, by protecting patients from unnecessary procedures and adverse events.[5] Conversely, if the GP is also acting as specialist to his or her own patients, there could be an incentive to make unnecessary specialist referrals and maintain overlong specialist follow-up. In the case of fundholding practices, this would have financial implications. Until now, regulations have prevented fundholding GPs from paying themselves to deliver outpatient services,[11] but recent changes in Department of Health regulations have now removed this constraint.[20] Clearly agreed clinical protocols on effective patterns of care can provide both an assurance of good clinical practice and some protection against perverse financial incentives.

Shared care between hospital and general practice is now a familiar way of providing obstetric services and managing chronic conditions such as diabetes. Depending on the levels of organization and training, the quality of care provided in this way has been evaluated either as inferior to, or as equal to hospital outpatient care.[12,13] A number of commentators have drawn attention to the implications that increasingly shared care will have for the role of the specialist. Tudor Hart noted in 1992 that, although UK hospital specialists had been under less pressure to subspecialize than their US counterparts, this situation was beginning to change.[14] One suggested response to what is seen by some as consultant over-specialization, is the creation of more 'community' specialists who could filter out patients suitable for treatment in the primary care setting, and work mainly in the community.[15] From the ranks of hospital practice, there may be concerns that such community specialists would become sub-grade consultants and that subsequent recruitment difficulties would occur. However, GPs themselves might well be suitable recruits as 'general physicians in the community', and might welcome this additional career development opportunity.[16] The NHS could stand to gain from such a development since GPs, by comparison to their hospital medical colleagues, have shown themselves to be more selective users of specialist investigations[17,18] and more ready to identify alternatives to hospital admission.[19]

Increasing involvement of general practice in the delivery of more specialist services is a trend that has been evident in various ways for some time. There are potential benefits to patients, the health service and GPs themselves. However, clear safeguards will be necessary both to protect traditionally valued aspects of general practice and to ensure that new services are delivered to the standards that patients have a right to expect.

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Telemedicine: ‘communication’ by any other name?

THERE is that word again: ‘telemedicine’. Whether the subject matter is rural health care, remote robotic surgery, or the omnipresent Internet, ‘telemedicine’ is news. So, what is telemedicine and what is its likely role in the future ?

The term ‘telemedicine’ is commonly used to describe the provision of health care using a telecommunications link where the patient is at a different location from the advising professional (Willemain TR, Mark RG. Models of health care systems. Unpublished manuscript). The same technology can, however, be used to deliver training and education at a distance (tele-education). Reflecting this, the European Commission[1] recently defined telemedicine as ‘the investigation, monitoring and management of patients and the education of patients and staff which allow access to expert advice and patient information no matter where the patient or relevant information is located.’ Advantages claimed for telemedicine include the ability to cross barriers of time and distance with associated reduced travel times and costs, increased availability of existing personnel and equipment through more rapid access to specialist services, an enhanced role for suitably supervised non-medical professionals, and the introduction of new health services to under-served areas.

Telemedicine is not a new idea. As early as 1897, the telephone was used to help diagnose croup in a child,[2] and X-ray transmission along a telephone line was described 50 years ago.[3] However, attempts to establish telemedicine services in the late 1960s and 1970s all failed principally because of the costs of acquiring and operating the technology, poor image quality, and administrative and staff-training issues. It was only later, in the 1980s, that telemedicine services, developed in Canada[4] and the UK,[5] showed their true potential.

Since then, four developments have made telemedicine more feasible: analogue telephone signals have become digital, line capacity (bandwidth) has increased phenomenally, the availability of high capacity communications links has increased, and the cost of installing and operating much of the telemedicine technology has decreased. As a result, activity in telemedicine is expanding. In the UK, there are pilot projects in radiology,[6] dermatology,[7] and trauma,[8] to name but three, and many other applications are possible.

So, what is the likely role of telemedicine in the future, particularly within general practice? The short answer is ‘uncertain’. This is a generic technology that can be used in a variety of ways. The challenge will be to find out where it is useful and where it is not. There is pressure, however, to introduce telemedicine services before they are fully evaluated, and this is coming not only from enthusiasts and the manufacturers, but also from some hospital trusts who see potential for service development in this area; some have already made consultant appointments in telemedicine. This looks premature because the business case remains unclear and must await formal health economic analysis.

More generally, important decisions still need to be taken about the choice of equipment, which ideally should be simple and flexible, and the development of an adequate national telecommunications infrastructure that would underpin a

telemedicine-based service. Other outstanding issues relate to data confidentiality and other legal aspects, the impact on roles within the health services, and the training that will be required.

Telemedicine could have a profound impact on primary care. The challenge will be to make sure that the potential developments really are helpful to general practitioners and really do improve health care.

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Keeping the meningococcus out of the media

THE meningococcus is harmlessly carried in the upper airways of up to 25% of adults, and yet causes a devastating disease in 2500 children every year in the United Kingdom (UK).[1] Ten per cent of these children will die.[2] The sudden death or acute onset of life-threatening illness in a child who was healthy until hours before is rare in modern society, and thus meningococcal disease continues to generate media interest,[3] particularly when an outbreak occurs.

The meningococcus would be most succesfully removed from the media headlines by preventing the disease through vaccination, but about 70% of meningococcal infections in the UK are caused by group B organisms, against which an effective vaccine remains elusive. Until such a vaccine becomes available, prompt recognition, administration of penicillin in the community,[4] and elective transfer by a specialist retrieval team to paediatric intensive care facilities may reduce the 30–60% mortality of those with septicaemia.

Meningococcal septicaemia (with fever, vomiting, headache, myalgia, abdominal pain, tachycardia, hypotension and an initially normal conscious level) is the severe end of a spectrum of disease caused by the meningococcus. The spectrum ranges from septicaemia to meningitis (characterized by lethargy, headache, fever, vomiting and neck stiffness) to chronic meningococcaemia (petechial rash with or without fever). Most cases present with a combination of the two syndromes of septicaemia and meningitis.

Eighty per cent of children with meningococcal disease have a petechial or purpuric rash (both types are haemorrhagic and hence non-blanching), but 13% have only a maculopapular rash and 7% may have no rash.[5] The presence of a haemorrhagic rash, even in the absence of symptoms of meningitis, should prompt immediate administration of parenteral penicillin (intravenous is preferable to intramuscular (IM) as absorption may be poor after IM injection if shock develops) and referral for in-patient management.

In order to prevent secondary cases, chemoprophylaxis with rifampicin (10 mg/kg twice daily for two days, 5 mg/kg for children under 1 year old and 600 mg in adults), ciprofloxacin (500 mg as a single dose in adults) or ceftriaxone (adults 250 mg as a single IM injection; children under 12 years, 125 mg) must be promptly offered to household members and 'kissing-contacts' of anyone who, clinically, is suspected of suffering from meningococcal disease.[6] Ceftriaxone is preferred in children who refuse oral medication and also in women who are pregnant. In the institutional setting (e.g. nursery or school), the standard advice is to inform parents if there has been a single case so that they can be vigilant for the development of symptoms such as rash or fever, and seek medical advice if these occur. Only if two cases occur does the advice change to recommend antibiotic prophylaxis for classroom (non-kissing) contacts; this, understandably, can be difficult for parents to accept.

The likelihood that a child presenting with meningitis has meningococcal disease, with or without rash, has proportionally increased as a result of the successful campaign of vaccination against Haemophilus influenza type b (Hib),[8] which has dramatically decreased the incidence of Hib meningitis. Of 1763 cases of meningitis notified to the Office of Population and Census Surveys in 1994, 52% were presumed to have been caused by the meningococcus.[7] The principal alternative diagnosis when bacterial meningitis is suspected is pneumococcal meningitis. In 1995, there were 65 *N. meningitidis* isolates from cerebrospinal fluid (CSF) reported to the Public Health Laboratory Service (PHLS) Communicable Disease Surveillance Centre, compared with 24 *Streptococcus pneumoniae* isolates from CSF in infants aged 5–11 months, and 291 compared with 67 in those aged 1–44 years (M Ramsay, personal communication). Athough not yet

standard practice, we suggest that because of the high probability of meningococcal disease, chemoprophylaxis should be offered as soon as possible to close contacts of all patients with suspected bacterial meningitis, in addition to all those who are contacts of patients with classic features of meningococcal infection, unless rapid laboratory diagnosis from blood or CSF (rapid latex antigen testing or Gram stain) suggests an alternative pathogen.

Contacts of children with suspected meningococcal disease who become unwell should be treated, initially in hospital, as if they have early disease, even if they have received chemoprophylaxis. Early disease can be unimpressive and without rash; therefore mild non-specific symptoms or signs in this setting should not be dismissed.

In establishing a diagnosis, lumbar puncture may lead to deterioration and possible death in children who have raised intracranial pressure, coagulopathy or shock, and should therefore be avoided if any signs of these are present. Children with all but the mildest disease are more safely managed in a unit with paediatric intensive care facilities available, and transfer is best effected by a specialist retrieval team.[9,10] Where meningococcal disease is suspected, ceftriaxone or cefotaxime are preferred for treatment, and a minimum seven day course is recommended. Traditionally, a chemoprophylactic course of rifampicin is given at the end of treatment to clear the nasal carriage of the organism, but it is not necessary if ceftriaxone has been used for treatment.

Despite generally poor responses to polysaccharide vaccines in young children, children of virtually all ages may respond to group A polysaccharide, and children older than 18 months to group C. In addition to chemoprophylaxis, it is therefore advisable to offer vaccination with polysaccharide A/C vaccine to all household and mouth-kissing contacts aged more than 2 years if group A or C meningococcal disease is proven microbiologically.[6,11]

The meningococcus can be difficult to isolate in the laboratory, and therefore the lack of bacterial growth on blood or CSF cultures does not exclude this diagnosis. Non-culture diagnostic methods such as PCR (in full) are promising but not yet routinely available for early diagnosis (PCR is being offered by the PHLS Meningococcal Reference Unit if the diagnosis is considered probable, but in practice it takes several days to get a result). This leads to difficulty in the management of children with petechiae for whom there is low suspicion of meningococcal disease, but an alternative aetiology, such as enteroviral infection, is more probable. Our criteria for discontinuing antibiotic therapy in less than seven days in an afebrile, well child are negative cultures at 48 hours (even though antibiotic pre-treatment does cloud the issue) plus low erythrocyte sedimentation rate/c-reactive protein test on the second day of admission, since these indices may not have risen on day 1.

Only immunization is likely to prevent the bulk of deaths from invasive meningococcal disease. Vaccines based on capsular polysaccharides have been effective for older children and adults in preventing diseases due to other encapsulated bacteria such as Hib and pneumococcus. Polysaccharide vaccines against Hib are poorly immunogenic in young children, but protein-polysaccharide conjugate vaccines have been developed which are protective in infants.[8] Conjugate vaccines for groups A and C meningococci, which also have polysaccharide capsules, are likely to be more efficacious in young children,[12] and immunogenicity studies are currently underway in Gloucester and Oxford. Group C meningococci cause about 30% of infections in the UK,[13] and it seems likely from the available preliminary data that a conjugate vaccine against group C could soon be introduced for routine use.

The polysaccharide capsule of the group B meningococcus (which causes 70% of disease in the UK) is chemically and antigenically identical to human brain and foetal antigens. Therefore, because the capsule is seen as 'self' by the immune system, it is poorly immunogenic in man.[14] In addition, there is concern that immunization with group B polysaccharide may breach self tolerance and result in auto-immune damage.

In view of these difficulties in producing a polysaccharide-based vaccine against the group B meningococcus, other bacterial components are being sought as vaccine candidates. Trials of outer membrane protein vesicle vaccines have been undertaken with promising results in older children and adults,[15,16] but their efficacy in young children (who form the predominant group affected by group B meningococcal disease) remains doubtful. In Brazilian children older than 4 years who were given two doses of a Cuban group B meningococcal outer membrane protein (OMP) vaccine, a 74% point estimate of protection was achieved, whereas estimates of protection were unconvincing in younger children.[16] A phase 2 immunogenicity trial of a genetically engineered Dutch OMP vaccine, which covers 80% of serotypes causing UK disease, is currently underway in Gloucester, and preliminary data suggests that this vaccine is safe and immunogenic in infants immunized with three doses at 2, 3 and 4 months of age and given a booster at 13 months of age (Poolman J, personal communication).

There is a clear need to understand immunity to group B meningococcus in pre-school children, and to identify the factors that distinguish the immune response in the young from that in older children and adults. As efficacious vaccines are not yet available, the best ways that primary care and hospital doctors can reduce the mortality from disease and keep the meningococcus out of the media, are to make an early diagnosis, give immediate antibiotic therapy, have access to intensive care facilities, give chemoprophylaxis to close contacts, and be vigilant for the development of secondary cases.

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