

BSSH

The British Society for Surgery of the Hand

Hand Surgery in the UK

Manpower, resources, standards and training

Report of a working party (2007)



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Executive summary and recommendations

The purpose of this report is to improve the quality of care for people who suffer from hand injuries and hand disorders.

Building on earlier reports from the BSSH, it focuses on the future development of hand surgery from its parent specialties of orthopaedic surgery and plastic surgery towards a separate specialty.

The report examines the facilities and organisation required to provide hand surgery care at a high standard, and considers the education, training and careers of those who provide it. It aims to support all of those who deliver hand surgery care by realistically defining the time, manpower and facilities that they require.

The report makes recommendations to medical directors and chief executives of hospitals, to chief executives of primary care trusts, and to the Department of Health, on arrangements that should be in place in hospitals that treat injuries and disorders of the hand. It also makes recommendations to postgraduate deans and to the Postgraduate Medical Education and Training Board on the education and training of hand surgeons.

The recommendations will require local modification to take account of different circumstances in different parts of the UK.

Recommendations

The following recommendations are addressed to medical directors and chief executives of hospital trusts, to chief executives of primary care trusts, and to the Department of Health

Hand injuries

Hand injuries should be treated by surgeons with expertise in hand surgery.

Many hand emergency cases can be treated as day-cases, especially if there are good arrangements for regional anaesthesia. Day surgery facilities for hand trauma cases should be widely available.

Anaesthetic support should include facilities for regional anaesthesia by brachial plexus block.

The hub-and-spoke model of services for hand trauma should be extended, to fit the requirements in each locality and to offer optimum care for each type of injury:

Severe or complex injuries, which may have vascular impairment, require immediate admission to a hand surgery unit that has facilities for soft-tissue and microvascular reconstruction. These cases require urgent surgery and may need many hours in the operating theatre as well as prolonged hospital stay and intensive postoperative hand therapy. Protocols for transfer of these cases to regional centres should be in place. The units that provide 24-hour cover for severe injuries should not place surgeons on call more frequently than one night in six.

Open fractures, badly contaminated wounds and bite wounds require operative treatment within a few hours and should be referred immediately to the hand surgery team on call.

Clean tendon or nerve divisions are suitable for immediate repair. However, irrigation and closure of the wound in the Emergency Department, followed by operative repair as a day-case on a daytime operating list in the next five days is also appropriate. These cases should be discussed with the hand surgery team on call on the day of injury.

Patients with closed fractures that do not require immediate surgery should be reviewed in a hand trauma clinic within 24 hours whenever possible

Hand surgery units are encouraged to construct guidelines for referral to hand trauma clinics in the light of local circumstances and local expertise in emergency departments and minor injury units.

Hospitals that are too small to maintain a full range of hand trauma care must have sound arrangements for obtaining advice from other units and for the transfer of patients for treatment elsewhere.

The risk of impairing hand trauma services through destabilising NHS hand surgery units should be considered when elective work is diverted to independent sector treatment centres.

Brachial plexus injuries should be discussed with a specialist in brachial plexus surgery within 24 hours of injury, even if the patient is not immediately fit for transfer, as these injuries may require exploration and repair during the first week.

Elective hand surgery

Most elective soft-tissue operations on the hand are suitable for day surgery, but overnight stay may be required by the nature of the surgery (especially for bony or extensive procedures), by the patient's general medical condition, and in a few cases by the distance between the patient's home and the hospital. Some complex cases require many hours of operating time, longer in-patient stay and prolonged postoperative therapy

Efficiency of operating lists can be optimised by the following measures:

Pre-admission assessment for elective hand surgery increases efficiency for both day surgery and inpatient cases, by reducing unplanned cancellations and improving theatre use.

All-day operating lists are more efficient than half-day lists and should be in place wherever possible.

Local anaesthesia operating lists should be used for cases where the services of an anaesthetist are not required.

Local anaesthesia cases should also be used as "fillers" for gaps between general/regional anaesthesia cases.

A surgeon and anaesthetist working regularly together is more efficient than ad hoc assignment of an anaesthetist from a large department.

Sufficient sterile instruments sets should be available for a rapid turnover in the operating theatre, especially when sterilising facilities are located at another site.

Mini C-arm image intensifiers should be available in hand surgery operating theatres, as they obviate the need for a radiographer and more expensive equipment.

Children's hand surgery should take place in a children's environment either at a children's hospital or an appropriate children's facility within a DGH or teaching hospital. Complex children's hand surgery requires specific training in paediatric orthopaedic and plastic surgery techniques, including microsurgical capability. There is economy of scale if paediatric and adult operating theatres are on the same campus, avoiding duplication of equipment and staff.

Good clinical outcomes depend on skilled hand therapy, and all hand surgery units should have the support of hand therapists. A population of 500,000 requires a minimum of six whole time equivalent hand therapists. Therapists should be present in hand surgery outpatient clinics.

The extended roles of hand therapists should be widened within the consultant-led hand surgery team

The work of "Assistants in surgical practice" should be confined within the consultant-led team.

Stringent local guidelines should safeguard the standard of care of patients and maintain professional accountability for extended roles of non-medically qualified staff.

Hand surgery outpatient clinics can be run effectively in peripheral units such as community hospitals, provided that hand therapy support and access to Xray are available on site.

The capacity of departments of clinical neurophysiology should be increased. Neurophysiological investigation should be available within six weeks of referral from the hand surgery unit.

As many cases of nerve entrapment can be managed on clinical criteria alone, direct referral for neurophysiological studies should not be available to GPs.

The following recommendations are addressed to postgraduate deans, Royal Colleges of Surgeons and members of the Postgraduate Medical Education and Training Board (PMETB).

Specialty status for hand surgery is a desirable goal that will have benefits for training, for the skill and knowledge of those who undertake hand surgery, and for the care of patients.

Hospitals should facilitate the development of their consultant staff to full-time practice in hand surgery, where appropriate.

In its proposals for the reorganisation of training, PMETB should consider how it can facilitate the development of specialty status for hand surgery.

Progress towards hand surgery as a separate specialty, with the attendant benefits for patient care, would be facilitated by increasing the time spent in advanced training. We recommend that PMETB provides the option of two years advanced training in hand surgery, probably in years ST7 and ST8. This change would require an increase in the number of advanced training posts.

Higher Specialist Training in orthopaedic surgery and plastic surgery should ensure that all orthopaedic and plastic surgeons are competent in the assessment of hand injuries and disorders, and in the management of straightforward cases

We also recommend that the requirement for shift working by trainees in orthopaedic and plastic surgery is minimised, so as to optimise the training opportunities during the working day.

1 Background and remit

- 1.1 The British Society for Surgery of the Hand considered resources and training in Hand Surgery in a booklet published in 1989 (BSSH 1989). In 1989-1990, an audit of activity in a district general hospital led to guidelines for resourcing a hand surgery service in a district hospital (Burke, Dias et al. 1991) and the information was incorporated in a further booklet 'Training and Resources in Hand Surgery: Profile of Hand Surgery Needs' (BSSH 1992).
- 1.2 These reports encouraged the development of hand surgery units and the provision of adequate services for hand surgery, but throughout the 1990's provision was hampered by resources that were inadequate to deal with the steadily increasing demand. The large increase in NHS funding over the last five years has reduced waiting lists for elective surgery, but there are concerns about cost-effectiveness and standards of care in the more diverse range of providers now treating NHS patients, and about the effect of these arrangements on training. Regrettably, delays in the treatment of hand injuries remain common, in part because no targets attach to trauma cases once they have been referred from the Emergency Department and trauma services have been left behind in the target-driven allocation of resources of the last few years.
- 1.3 The circumstances that necessitate a re-examination of resources, standards and training in hand surgery include:
 - The need to ensure appropriate and timely care of hand trauma
 - Variation in the provision of services for hand injury across the UK
 - Impact of the European Working Time Directive
 - Changes in the training programmes of surgeons
 - Independent sector provision of elective surgery
 - Changing roles of non-medical staff
- 1.4 In the light of these changes, the Council of the BSSH invited a working party to review and update the previous reports. The remit of the working party was to:
 - Recommend improvements in the organisation and provision of hand surgery services
 - Examine standards of care in hand surgery
 - Clarify the interface between hand surgery and the parent specialties
 - Define the workforce and other requirements for the provision of hand surgery
 - Explore the optimum training programmes for hand surgery
 - Define the roles of non-surgical staff
 - Explore expansion of the role of hand therapists

2 Defining hand surgery and hand surgeons

What is hand surgery?

- 2.1 Hand surgery is generally defined as “surgery of the hand, wrist and peripheral nerves of the upper limb”. It includes reconstructive procedures after nerve injury. It is a regional specialty that employs skills from the overlapping specialties of orthopaedics and plastic surgery.
- 2.2 Hand surgery employs more diverse skills than many other surgical disciplines, encompassing small bone fixation, microsurgery, arthroscopy, joint replacement, and the reconstruction of skin, muscle, tendon and nerve.
- 2.3 The hand therapist works in close partnership with the hand surgeon and is crucial in restoring the functioning of the gliding tissue planes upon which hand function depends.

Who performs hand surgery?

- 2.4 The working party identified 326 surgeons performing hand surgery in the UK in 2002 (see Appendix). Eighty-six percent were Members or Associates of the British Society for Surgery of the Hand. The parent specialties were orthopaedic surgery (67%), plastic surgery (31%) and A&E Medicine (1%). Most of these clinicians also practice in other areas of the parent specialty, but two thirds devote at least half their time to hand surgery and 15% practise exclusively in hand surgery (BSSH census 2003/4). Of the 326 surgeons, 275 worked in England.

Where is hand surgery performed?

- 2.5 There are three types of unit in which hand surgery is performed (numbers below refer to the whole of the UK; figures for England alone are in the Appendix.

Regional centres (37). A unit with three or more surgeons practising in hand surgery alone or with a major interest in hand surgery [156/326 (49%) of surgeons]. These units receive tertiary referrals including complex hand trauma. One third of known hand surgery activity in England is delivered by regional centres.

Acute hospitals (125). Units with one or two surgeons with an interest in hand surgery who deal with part or all of the hand trauma from their catchment area and with elective hand surgery [170/326 (51%) of surgeons]

Smaller units (73) with no sub-specialist hand surgeon, referring much of the hand trauma to other units. 15-20% of surgery for common hand disorders in England is performed in such units, but this figure probably underestimates the volume of hand surgery performed by general orthopaedic and plastic surgeons.

3 Hand injuries

Current provision

- 3.1 Twenty percent of patients attending Accident and Emergency Departments have hand injuries, equating to more than 1.36 million attendances for hand injuries in the UK each year. One in five of these injuries (271,000) require specialist care, and 71,000 patients require surgery (BSSH 1992; Dias 1999). These estimates are consistent with the annual incidence of hand fractures at all ages of 3.6 per 1000 in British Columbia, Canada (Feehan and Sheps 2006) and the UK incidence for adults and children of 1.8 and 2.6 per 1000 respectively (van Staa, Dennison et al. 2001; Cooper, Dennison et al. 2004).
- 3.2 Hand injuries predominantly affect the young working population and are a major source of disability, causing significant costs to individuals and society through time away from work (Rosberg, Carlsson et al. 2005).
- 3.3 Improvements in health and safety practices and legislation have reduced the incidence of mangling hand injuries in developed countries, but these injuries still occur and require urgent treatment that may involve many hours in the operating theatre.
- 3.4 Many surgical procedures are relatively short (1 hour) but there is a range to intermediate length (>2 hours) with infrequent cases (often of extreme urgency) requiring many hours of operating time.
- 3.5 A survey from one district general hospital in 2000 (Table 1) (Burke, Dias et al. 2004) found that 2425 hand trauma cases needed specialist care per year per 500,000 population. These cases required 635 operations. The number of new and review outpatient visits was 7650.
- 3.6 An audit of hand injuries identified serious shortcomings in service provision (Dias 1999). Most hand injuries occurred in the daytime with patients arriving in emergency departments in the late morning or afternoon. At the time of the audit, most emergency hand surgery was performed late in the afternoon or evening, or was deferred until the following day. There were often delays in treatment of more than 24 hours, most commonly due to lack of available operating theatre time (62%) and shortage of staff (13%).
- 3.7 Over the last five years, waiting times for elective surgery have reduced, but there are no targets yet set for the operative treatment of trauma. In many hospitals, investment has only followed targets; resources for the timely and efficient treatment of trauma remain inadequate.
- 3.8 A hub-and-spoke model of the organisation of hand trauma services is favoured (see section 5: Organisation of Hand Surgery Services).
- 3.9 Hand surgery units should accept a low threshold for referral from the Emergency Department and Minor Injury Units, where staff are not expected to have the expertise to distinguish between a "minor" hand injury of no significance and a "minor" injury that leads to a poor outcome without specialist care.

Day surgery for hand injuries

- 3.10 Day surgery facilities for treatment of straightforward hand trauma are still poorly provided in the NHS. 12,243 primary simple tendon repairs (OPCS code T67.6) performed in England in 2004/5 consumed 20,674 bed-days and only 4% were day cases (<http://www.hesonline.nhs.uk>), although most would be suitable for day surgery. Increasing day surgery provision would result in substantial savings and greater convenience for patients.
- 3.11 Introduction of a day-case emergency hand surgery system in Birmingham in November 2003 increased the proportion of patients treated as day cases from 4% to 60%, with an estimated saving of 1656 bed days in 2004/5. Complaints fell from four per week to two in two years. A hand unit coordinator who liaised with patients, surgeons and the ambulatory theatre department was felt to be essential in this system (Mahon 2006). Day surgery lists for hand trauma are in operation in some other centres but should be used more widely.
- 3.12 Clinics for review of hand injuries within 24 hours of the Emergency Department attendance greatly facilitate prompt treatment and selection of the optimum time for surgery.

Recommendations

- 3.13 Hand injuries should be treated by surgeons with expertise in hand surgery.
- 3.14 Many hand emergency cases can be treated as day-cases, especially if there are good arrangements for regional anaesthesia. Hospitals should be encouraged to provide day surgery facilities for hand trauma cases.
- 3.15 Anaesthetic support should include facilities for regional anaesthesia by brachial plexus block, which is the optimum mode of anaesthesia for many hand trauma cases. It provides excellent postoperative analgesia and avoids the risk of disruption of repairs during a restless recovery from general anaesthesia.
- 3.16 Severe or complex injuries, which may have vascular impairment, require immediate admission to a hand surgery unit with facilities for soft-tissue and microvascular reconstruction. These cases require urgent surgery and may need many hours in the operating theatre as well as longer hospital stay and intensive postoperative hand therapy. Protocols for transfer of these cases should be in place.
- 3.17 Open fractures, badly contaminated wounds and bite wounds require operative treatment within a few hours. They should be referred immediately to the hand surgery team on call.
- 3.18 Clean tendon or nerve divisions are suitable for immediate repair. However, irrigation and closure of the wound in the Emergency Department, followed by operative repair as a day-case on a daytime operating list in the next five days is also appropriate. These cases should be discussed with the hand surgery team on call on the day of injury.
- 3.19 Patients with closed fractures that do not require immediate surgery should be reviewed in a hand trauma clinic within 24 hours whenever possible
- 3.20 Hand surgery units are encouraged to construct guidelines for referral to hand trauma clinics in the light of local circumstances and local expertise in emergency departments and minor injury units.
- 3.21 Brachial plexus injuries should be discussed with a specialist in brachial plexus surgery within 24 hours of injury, even if the patient is not immediately fit for transfer, as these injuries may require exploration and repair during the first week.

4 Elective hand surgery

Current provision

- 4.1 Between 1990 and 2000, referrals for elective hand surgery increased by 36% from 1445 to 1960 per 500,000 population (BSSH 1992; Burke, Dias et al. 2004). Referrals for carpal tunnel syndrome almost doubled and for osteoarthritis almost trebled over the decade (Wildin, Dias et al. 2006).
- 4.2 In 2000, 56% of new outpatient attendances were booked for surgery (Burke, Dias et al. 2004). 995 operations were required per 500,000 population.
- 4.3 Elective hand surgery workload has increased substantially since 2000. Carpal tunnel decompressions in England increased by 29% from 38,138 in 2000/1 to 49,352 in 2004/5. Palmar fasciectomy for Dupuytren's disease increased by 14% over the same period (9975 to 11111) (<http://www.hesonline.nhs.uk>).
- 4.4 Day surgery was used for 91% of carpal tunnel decompressions in 2004/5 (<http://www.hesonline.nhs.uk>). There will always be a few cases where co-morbidity or home circumstances require an overnight stay. It is not clear if the low figure for palmar fasciectomy (46% day cases in 2004/5) reflects a shortage of day surgery facilities or a perception among surgeons that this longer and more major procedure requires elevation of the hand in hospital overnight. The great majority can and should be managed as day cases, as occurs in the USA and other countries.
- 4.5 Soft-tissue operations on the hand cause moderate pain that can be controlled by oral analgesic medication and are almost all suitable for day surgery. However, bone and joint procedures such as trapezial excision arthroplasty and wrist surgery cause greater pain that may require parenteral analgesia for over 24 hours; many of these cases require inpatient admission for adequate pain control. Short-stay or 23 hour units are appropriate for many cases that are not suited to day surgery.
- 4.6 A small but significant proportion of hand surgery requires lengthy operations and prolonged inpatient treatment because of case complexity and/or long distance between patients' homes and the hand centre.
- 4.7 The short duration of some hand operations creates a risk that the operating theatre will be unused during induction of general or regional anaesthesia. Anaesthetists require good support from nurses or operating department assistants; staffing that allows an operation to proceed under brachial plexus block while the anaesthetist prepares the block on the next case maximises efficiency. Judicious interspersing of short cases in which local anaesthesia is administered by the surgeon can assist in the same fashion.

Local variations

- 4.8 Wide variation in the rates of operative intervention for hand conditions is evident from the data from regional health authorities. The variations below are between individual health authorities; regional variations are summarised in the Appendix.

Operative intervention for Dupuytren's contracture varies from 0.04 to 0.36 cases per 1,000 population (overall rate for England and Wales 0.21 per 1,000 per annum).

Operative intervention for carpal tunnel syndrome varies from 0.25 to 1.31 cases per 1,000 population (overall rate for England and Wales 0.77 per 1,000 per annum).

Surgical intervention rates for hand conditions in London are particularly low.

- 4.9 International comparisons for carpal tunnel surgery indicate that the UK rate is at the lower end of the range. For example, the rate in the state of Maine, USA of 1.44 per 1000 per annum (Keller, Largay et al. 1998) is double the rate for England and Wales (see Hobby and Dias 2006).
- 4.10 Variations may be explained by factors such as; ease of access to primary care; regional and ethnic variations in the prevalence of common disorders; differences in rates of presentation and age profile of populations; availability of hand surgeons; variations in the quality of data recording; surgeon training and treatment practices. Nevertheless, the figures suggest that intervention rates are low in comparison to other countries and that access to hand surgery care is inadequate in some parts of the UK.

Recommendations

- 4.11 Most elective soft-tissue operations on the hand are suitable for day surgery.
- 4.12 Overnight stay may be required by the nature of the surgery (especially for bony or extensive procedures), by the patient's general medical condition, and in a few cases by the distance between the patient's home and the hospital.
- 4.13 Some complex cases require many hours of operating time, longer in-patient stay and prolonged postoperative therapy
- 4.14 Local anaesthesia operating lists should be used for cases where the services of an anaesthetist are not required.
- 4.15 Local anaesthesia cases should also be used as "fillers" for gaps between general/ regional anaesthesia cases.
- 4.16 All-day operating lists are more efficient than half-day lists and should be in place wherever possible.
- 4.17 A surgeon and anaesthetist working regularly together is more efficient than ad hoc assignment of an anaesthetist from a large department.
- 4.18 Pre-admission assessment for elective hand surgery increases efficiency for both day surgery and inpatient cases, by reducing unplanned cancellations and improving theatre utilisation.
- 4.19 Good clinical outcomes depend on skilled hand therapy. A population of 500,000 requires a minimum of six whole time equivalent hand therapists (Burke, Dias et al. 2004).
- 4.20 Hand surgery outpatient clinics can be run effectively in peripheral units such as community hospitals, provided that hand therapy support and access to Xray are available on site.

5 Organisation of hand surgery services

Models of hand surgery provision

- 5.1 Several models of organisation of hand surgery services have evolved in the UK, including:

Regional plastic surgery unit, taking severe and complex injuries from surrounding hospitals, providing microsurgical and other soft-tissue reconstructions for trauma. Deals with a wide range of elective cases including complex cases and children's surgery.

Teaching hospital unit with combined or linked orthopaedic/plastic hand surgery service. Deals with all hand trauma from local catchment area and some tertiary referrals for both trauma and elective work. Many provide microsurgical and other soft-tissue reconstructions for trauma and elective cases, and deal with reconstruction of the child's hand. On-call rota for hand trauma.

Large District General Hospital with one or two hand surgeons, usually in orthopaedic departments. The hand surgeons take part in the general trauma on-call rota and there is no separate rota for hand trauma. The more severe and urgent hand trauma cases are referred on to a regional or teaching unit, but cases that can be deferred are passed to the hand surgeons by their colleagues. Provides elective hand service, but refers complex cases.

Small District General Hospital with no surgeon with specific interest in hand surgery. Simple hand trauma and elective cases may be dealt with by general orthopaedic surgeons as local expertise allows; others are referred.

- 5.2 Many variations on these themes exist. The organisation of hand surgery services must be compatible with providing a prompt and convenient local service for straightforward cases, but at the same time giving specialist care to complex cases. The larger units that receive complex and urgent cases should have sufficient staff to permit an on-call rota no more frequent than 1 in 6.
- 5.3 The hub-and-spoke arrangement has much to commend it in the support that it can give to surgeons in smaller hospitals (BMA 1998). The "managed care network" based in the hand surgery unit at Wrightington hospital is a good example.
- 5.4 Joint working and cooperation between plastic and orthopaedic hand surgeons has been facilitated by the expansion of consultant staffing in the last decade, especially with regard to provision of hand trauma care. There is scope for such cooperation to be extended across the country in appropriate units.

Recommendations

- 5.5 Hospitals that are too small to maintain a full range of hand trauma care must have sound arrangements for obtaining advice from other units and for the transfer of patients for treatment elsewhere.
- 5.6 Children's hand surgery should take place in a children's environment either at a children's hospital or an appropriate children's facility within a DGH or teaching hospital. Complex children's hand surgery requires specific training in paediatric orthopaedic and plastic surgery techniques, including microsurgical capability. There is economy of scale if paediatric and adult operating theatres are on the same campus, avoiding duplication of equipment and staff.
- 5.7 The hub-and-spoke model should be extended for both elective and trauma hand surgery, so that the larger centres can support smaller units.

Development of hand surgery as a separate specialty

- 5.8 Specialisation in surgery brings benefits for patients because of the greater knowledge and skills of doctors who focus on a particular domain of medicine.
- 5.9 The trend towards subspecialisation across the whole of surgery in recent years is no less evident in hand surgery, which has evolved into an interface specialty between orthopaedic surgery and plastic surgery. Hand surgery is a separate surgical specialty in several countries (e.g. Sweden, Finland), but has yet to separate fully from the parent disciplines in the UK despite the fact that it is already larger than many small specialties (e.g. clinical genetics). Although the number of surgeons practising exclusively in hand surgery is increasing, several factors restrain this trend:
- Requirement for hand surgeons to participate in general orthopaedic or plastic surgery on-call rotas in their departments, or to contribute to the general elective work
 - Desire of some surgeons to retain a more general orthopaedic or plastic surgery practice
 - Separate on-call rotas for hand surgery are excessively onerous except in large departments.
- 5.10 However, general orthopaedic and plastic surgery colleagues have their own subspecialty interests to follow and are increasingly reluctant to take on hand surgery cases.
- 5.11 Changes in the training of specialists under "Modernising Medical Careers" may influence the development of hand surgery as a specialty.

Recommendations

- 5.12 Specialty status for hand surgery is a desirable goal that will have benefits for training and for the skill and knowledge of those who undertake hand surgery, and for the care of patients.
- 5.13 Hospitals should facilitate the development of their consultant staff to full-time practice in hand surgery, where appropriate.
- 5.14 In its proposals for the reorganisation of training, PMETB should consider how it can facilitate the development of specialty status for hand surgery.

6 Workforce requirements

Hand surgeons

- 6.1 The hand surgery requirements per week per 500,000 population are based on the 2000/2001 audit of DGH activity at Derby (Burke, Dias et al. 2004):
 - a) six elective and four trauma operating sessions
 - b) trauma operating time spread throughout the week with facility to extend operating beyond routine working hours to deal with urgent and complex cases according to need
 - c) 14 outpatient sessions to care for 92 new patients (46 trauma, 46 elective) and 160 review patients (100 trauma, 60 elective).
 - d) Access to an appropriate combination of day surgery, short-stay and inpatient beds.
- 6.2 Provision of a hand surgery service for a population of 500,000 requires at least five consultant hand surgeons on 10 PAs, based on a PA allocation of 1 for on-call work, 1 for clinical administration, 5.5 for direct clinical care and 2.5 for supporting activities.
- 6.3 Modifications would be required in units with heavy out-of-hours commitments.
- 6.4 Plans for the surgical workforce should recognise that increasing specialisation throughout orthopaedic and plastic surgery has diminished the ability of general orthopaedic and plastic surgeons to manage hand injuries effectively, and that this trend will continue.

Hand therapists

- 6.5 Hand therapy is fundamental to achieving good results from hand surgery, and crucial after procedures such as tendon repair. Hand therapists combine the three skills of physiotherapy, occupational therapy and nursing. Some units have individuals that represent each skill, but in many units each therapist possesses all three skills.
- 6.6 Hand therapists play a large part in the post-operative management of patients and in the non-operative management of hand injuries. Their role in motivating patients and monitoring progress is crucial. In some centres, hand therapists have taken on extended roles such as wound care, assessment of common hand conditions and treatments such as injection of trigger digits, within the hand surgery unit as part of the hand surgery team. Therapists are well-placed to conduct audit and monitor outcomes of treatment. They also have an important role in the training of surgeons.
- 6.7 A minimum of six full-time equivalent hand therapists is required for a population of 500,000. This recommendation excludes time spent in any extended roles. When assessed in 2000, there was a substantial underprovision of hand therapy in most regions and units in the UK (Burke, Dias et al. 2004).
- 6.8 Hand therapy is also integral to outpatient management of hand disorders. Therapists should be present with surgeons in the outpatient department, and the hand therapy department should be adjacent to the hand surgery outpatient department wherever possible (Peck, Kennedy et al. 2004).

Other staff

- 6.9 Regional anaesthesia for hand surgery requires appropriate training and skills of anaesthetists. A close working relationship between surgeon and anaesthetist can do much to increase efficiency.

Recommendations

- 6.10 All hand surgery units should have the support of hand therapists.
- 6.11 Therapists should be present in hand surgery outpatient clinics.
- 6.12 The extended roles of hand therapists should be encouraged.

7 Supporting facilities and equipment

Outpatient clinics

- 7.1 As symptoms in the hand may have their origin elsewhere in the body, hand surgery clinics should allow examination of the whole patient with privacy for undressing and examination, and appropriate nursing support. Facilities for injections and wound care are also required.

Investigations

- 7.2 Neurophysiological testing is essential in evaluation of nerve entrapment syndromes that form a substantial part of hand surgery work. In some parts of the UK, access to neurophysiological services is poor and waiting times are long.
- 7.3 Neurophysiological testing is unnecessary in some cases of carpal tunnel syndrome. Therefore, patients with suspected CTS should not be referred directly by GPs for neurophysiological testing. Neurophysiological services will be used more efficiently if the indication for testing is determined by the hand surgery team, who have the expertise to know if treatment can be given safely without testing.
- 7.4 Achievement of the proposed 18 week interval between patient referral and treatment will require new approaches to the provision of neurophysiological testing.
- 7.5 Hand surgery requires plain radiography at each clinic, and good access to CT, MRI and ultrasound examination.

Operating theatres

- 7.6 Safe hand surgery requires good anaesthesia, the sterile environment of an operating theatre, good lighting, fine instruments that are maintained in good condition and operating staff who are knowledgeable about the procedures to be performed. Loupe magnification is frequently required, and some cases require an operating microscope that provides binocular vision for both surgeon and assistant.
- 7.7 Fluoroscopy is required for many cases. The newer compact image intensifiers (Mini C-arm) can be used by an appropriately-trained surgeon without a radiographer present.

Recommendations

- 7.8 Mini C-arm image intensifiers should be available in hand surgery operating theatres, as they obviate the need for a radiographer.
- 7.9 Sufficient sterile instruments sets should be available for a rapid turnover in the operating theatre, especially where sterilising facilities are located at another site.
- 7.10 The capacity of departments of clinical neurophysiology should be increased, so that these investigations can be provided within six weeks of referral from the hand surgery unit.
- 7.11 General Practitioners should not be able to refer directly for neurophysiological studies, as in many cases the hand surgery team is able to manage the patient effectively without them.

8 Education and training in hand surgery

Specialist registrar training in 2006

- 8.1 In 2006, training in the basics of hand surgery is a core curriculum component of Higher Specialist Training in orthopaedic surgery and plastic surgery, with the objective that all orthopaedic and plastic surgeons are competent in the assessment of hand injuries and disorders, and in the management of straightforward cases. Knowledge is assessed in the Intercollegiate examinations in orthopaedic and plastic surgery leading to the diplomas of FRCS(Tr &Orth) and FRCS(Plast), which are required for the certificate of completion of training (CCT) and for the subsequent inclusion on the specialist register of the GMC that is required for consultant posts in orthopaedic surgery and plastic surgery. Training at this level also provides a foundation for further training as a hand surgeon.
- 8.2 Training at this level is provided by rotation through registrar posts offering subspecialty experience in hand surgery. The quality of training is dependent on the enthusiasm of the consultant trainer and has the advantage of an apprenticeship. Some training programmes have difficulty ensuring that all trainees spend six months on a hand surgery team. Establishment of more hand surgery consultant posts would correct this deficiency.
- 8.3 Advanced training in hand surgery in the UK is carried out under the guidance of the Interface Committee in Hand Surgery, which is part of the Joint Committee for Higher Surgical Training (JCHST) and comprises representatives from the BSSH and the Specialist Advisory Committees (SAC) in Trauma and Orthopaedics and Plastic Surgery. An associate postgraduate dean acts as lead dean for the specialty of hand surgery and sits ex-officio on the Interface Committee.
- 8.4 Ten advanced training posts in hand surgery, which are based in large hand surgery units, are approved by the Interface Committee. Surgeons in years 4-6 of higher specialist training are appointed competitively to these posts for 6 or 12 months, depending on the trainee's preference and requirement.
- 8.5 Advanced training is also acquired through other fellowships in the UK and overseas. These posts are arranged by individuals and are not inspected by the Interface Committee, but may count towards training for CCT purposes.
- 8.6 Appointment to a post of consultant hand surgeon or consultant in orthopaedic/plastic surgery with an interest in hand surgery would normally require advanced training.

The European Working Time Directive

- 8.7 In the last decade, opportunities for surgical training have reduced substantially as a result of changes in the working hours of junior doctors. Many surgeons view with concern the potential for degradation of training with the implementation of a 48-hour limit by 2009. Solutions to the conundrum of achieving EWTD compliance while providing high-quality services for patients and ensuring appropriate training have not yet appeared. Many feel that the acquisition of sufficient surgical skills and experience for competent practice at consultant level will be difficult in the arrangements that are proposed. We note for comparison the recent introduction of an 80-hour limit (excluding educational time) for junior doctors in the USA.
- 8.8 Out-of-hours work by trainees, sometimes involving shift working, requires compensatory rest periods and consumes valuable training time. Moving appropriate hand trauma cases from evenings and weekends to the working day can do much to enhance opportunities for training.

“ Modernising Medical Careers”

- 8.9 The effect of changes in training that will be introduced by the Postgraduate Medical Training and Education Board (PMETB) are not yet clear. In particular, there is uncertainty over the level of competence that will be achieved at the end of specialist training. The provision of the advanced training that will be required to enable surgeons to deal with the full range of hand surgery has not been defined. The combination of the EWTD and pressure to shorten training has the potential for a deleterious effect on training in hand surgery.
- 8.10 Hand surgery is based on a sound foundation of knowledge and skills in the parent specialties. The training of a hand surgeon should include time in both plastic and orthopaedic surgery.
- 8.11 We recommend that PMETB ensures that trainees in orthopaedic and plastic surgery continue to gain experience in hand surgery, and that the requirement for shift working by these trainees is minimised, so as to maximise the training opportunities during the working day.
- 8.12 Progress towards hand surgery as a separate specialty, with the attendant benefits for patient care, would be facilitated by increasing the time spent in advanced training.

Education in hand surgery

- 8.13 The BSSH runs an instructional course series comprising six two-day courses over three years, giving comprehensive coverage of all aspects of hand surgery. Attendance averages 150 participants, most of whom are surgical trainees from the UK.
- 8.14 The biannual scientific meetings of the BSSH and the annual Congress of the Federation of Societies for Surgery of the Hand (FESSH) also provide opportunities for education. In addition, many successful courses in individual departments testify to the popularity of hand surgery.
- 8.15 A joint diploma in hand surgery run by BSSH and the University of Manchester commences in 2007. The diploma programme is taken during a 6-12 month advanced training post; it comprises seven taught modules each consisting of four tutorials, and a final examination.

Recommendations

- 8.16 Higher specialist training in orthopaedic surgery and plastic surgery should ensure that all orthopaedic and plastic surgeons are competent in the assessment of hand injuries and disorders, and in the management of straightforward cases
- 8.17 We recommend that the requirement for shift working by trainees in orthopaedic and plastic surgery is minimised, so as to optimise the training opportunities during the working day.
- 8.18 We recommend that PMETB provides the option of two years advanced training in hand surgery, probably in years ST7 and ST8. This change would require an increase in the number of advanced training posts.

9 Maintaining standards of care

Referral arrangements from A&E Departments

- 9.1 Hand surgery units must have sufficient capacity to see all those patients referred from Emergency Departments with the urgency that the injury demands. Opportunities for optimum treatment may be lost by delay. Local arrangements for referral should maximise the possibilities for timely and appropriate treatment, and make clear the referral policies for seriously injured cases.

Allocated time for hand trauma cases

- 9.2 The European Working Time Directive (EWDT) and requirements of CEPOD encourage hospitals to bring surgery for trauma cases into the working day, wherever possible. Appropriate supervision of hand trauma cases is more likely to be assured in next-day operating lists than in late-night emergency lists.

Independent sector treatment centres

- 9.3 Recent initiatives to transfer some elective surgery to the independent sector may reduce the resources available to NHS hospital trusts from primary care trusts. In some areas, adverse consequences for provision of elective and emergency care within the NHS have occurred. These initiatives may also deprive the NHS of opportunities to train surgeons, theatre nurses and hand therapists; at present, the independent sector makes no contribution to training of NHS staff.
- 9.4 Evidence submitted by the British Orthopaedic Association to the Department of Health describes some serious errors occurring in independent sector treatment centres that question the arrangements for assessing competence and measuring outcome in these units.
- 9.5 We recommend that the crucial importance of UK higher specialist training and assessment in maintaining standards of care is given the recognition that it deserves.

“Surgical care practitioners”

- 9.6 Government has encouraged doctors to train non-medical staff such as nurses and therapists in medical tasks. We support exploration of ways of increasing flexibility of the workforce and working across professional boundaries, provided that there are stringent local guidelines that safeguard the standard of care of patients and maintain professional accountability.
- 9.7 Wound care, monitoring postoperative progress, and the diagnosis and non-operative treatment of disorders such as trigger digits and basal thumb osteoarthritis are good examples where the extended role of the hand therapist has contributed to the work of the hand unit.
- 9.8 Although the Royal College of Surgeons of England has set standards for training and practice of surgical care practitioners (SCPs), their use for operative procedures is controversial. We do not support independent practice of surgical care practitioners outside the consultant-led team, and agree with the British Orthopaedic Association that “Assistants in Surgical Practice” would be more appropriate terminology and is less likely to mislead patients.

Revalidation

- 9.9 The report "Good Doctors, Safer Patients" (Donaldson 2006) recommends renewal of specialist certification at regular intervals of no longer than five years. Royal colleges and specialist associations will set standards for specialist practice and develop assessments to ensure a competent practice. Revalidation for hand surgery will need to recognize that those who practise exclusively in hand surgery will require revalidation in that field and will not be well served by demands for revalidation in the parent specialty. In that sense, development of hand surgery as a separate specialty would facilitate revalidation.

Appendix

Provision of hand surgery in the UK

The method of collection of data is described in Hobby and Dias (2006). Briefly, a list of consultant hand surgeons in England was compiled from the British Society for Surgery of the Hand (BSSH), British Association of Plastic Surgeons (BAPS) and British Orthopaedic Association (BOA) membership lists for 2002. Consultants who were members or associates of the BSSH were considered to be hand surgeons. In addition, the Dr Foster survey (2003) of specialist interests of orthopaedic surgeons was reviewed. The Medical Register 2002 was used to confirm the main NHS appointment of each surgeon. Surgeons with no NHS appointment were excluded.

Activity data for 2001 from the Department of Health Hospital Episodes Statistics for each Health Authority and Region were cross-tabulated against the number of surgeons in each unit, and related to the population for each Health Authority, using population data from the 2001 UK Census.

Note that data on surgeons but not on activity were available from Scotland, so the figures below relate to England alone (as in Hobby and Dias 2006), or to England and Wales.

Table 1 Activity Data for England

Unit	Number of surgeons/units	CTD		DUP		Ganglion	
3 or more	140 surgeons in 35 units	11960	32%	4237	41%	1809	(28%)
2 hand surgeons	72 surgeons in 36 units	9228	24%	2125	21%	1517	(24%)
1 hand surgeon	63 surgeons in 63 units	9933	26%	2393	23%	1680	(26%)
no hand surgeons	56 units	6624	18%	1601	15%	1363	(21%)
	275 surgeons / 190 units	37745		10356		6369	

Table 2 Activity Data for England and Wales- surgery rates per 1,000 population per annum

Health Region	Number of Hand Surgeons		Population	Dup	CTD	Ganglion
Northern & Yorkshire	38 surgeons	(1/163,500)	6,216,480	0.3	0.8	0.18
Trent	31 surgeons	(1/164,000)	5,087,228	0.25	0.93	0.15
South West	20 surgeons	(1/246,500)	4,928,458	0.23	0.8	0.14
North West	40 surgeons	(1/161,000)	6,448,912	0.22	0.67	0.12
Eastern	28 surgeons	(1/192,500)	5,388,154	0.21	0.81	0.13
Wales	12 surgeons	(1/242,000)	2,903,085	0.21	0.55	0.09
West Midlands	29 surgeons	(1/181,500)	5,267,337	0.2	0.84	0.13
South East	43 surgeons	(1/200,500)	8,630,226	0.19	0.84	0.13
London	48 surgeons	(1/149,500)	7,172,036	0.1	0.52	0.11
England & Wales	289 surgeons	(1/170,000)	52,041,916	0.21	0.77	0.13

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