

Provision of Endoscopy Related Services in District General Hospitals

AUTHORS

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BACKGROUND

Nearly 10 years ago, a BSG Working Party reported on the Provision of GI Endoscopy and Related Services for the District General Hospital.¹ The Report was prepared to inform Hospital Managers of the need for Gastrointestinal Endoscopy and the facilities that were required for its delivery. Progress in the management of patients with gastrointestinal disease and new technology means that these guidelines are now out of date. Changes in equipment, requirements for the sterilisation of endoscopes,^{2,3} advice on re-use of endoscopic accessories⁴ and clinical governance are only a few of the changes that have occurred during the last ten years. In addition, the introduction of Evidence Based Practice and the widespread use of Clinical Guidelines and protocols are significant factors influencing the work of Endoscopy Units.

This Report focuses on a number of key areas, including the requirements for endoscopy, where this should be performed, the facilities required in an endoscopy unit, the provision of emergency endoscopy and the relationship between the secondary and primary care sectors in the delivery of the service.

PROVISION OF ENDOSCOPY SERVICES

Referrals to most gastrointestinal endoscopy units fall into three main categories:

- a Open Access
- b Outpatient Generated
- c Urgent Inpatients

The Department of Health has now made recommendations on the minimum provision of Gastrointestinal Endoscopy in District General Hospitals which accept emergency patients and these should act as a bench mark for all DGH Units.^{5 Appendix} These Service standards clearly establish the quality framework for Endoscopy Units in District General Hospitals in terms of staffing, record keeping, equipment, and liaison with other departments.

CLINICAL NEED FOR AN EFFECTIVE ENDOSCOPY SERVICE

- a *Diagnostic Upper Gastrointestinal Endoscopy*
The requirement for Upper Gastrointestinal

Endoscopy in the general population is now in excess of 10 per 1000 population per annum and may be as high as 15 per 1000 population per annum where general practitioners have unrestricted access to upper gastrointestinal endoscopy (M G Bramble personal communication). This compares to a figure of 8.6 per 1000 population in 1992⁶ and gives an annual workload of approximately 3000 examinations in a District General Hospital serving a population of 250,000. It is likely that the number of elderly patients requiring gastroscopy will gradually rise whilst younger patients will be treated more frequently without recourse to diagnostic gastroscopy.

- b *Flexible Sigmoidoscopy*

The current requirement for flexible sigmoidoscopy in the general population is much more difficult to calculate as many examinations are basically limited colonoscopies. A reasonable estimate would be 2–2.5 per 1000, giving a workload of between 500–600 examinations per year.

This is likely to increase with the advent of the requirement to provide more rapid diagnosis of colorectal cancer. Many hospitals are now trying to establish endoscopy lists specifically devoted to patients with new onset rectal bleeding, this is likely to lead to an increased number of flexible sigmoidoscopies and colonoscopies being performed. The inability of the endoscopist to reach the splenic flexure with a flexible sigmoidoscope⁷ means that a colonoscope should be used in preference for most examinations. This also leaves the endoscopist the option of performing a full examination, if indicated at the time.

- c *Colonoscopy*

The majority of District General Hospital Gastroenterology Units now perform between 2.5 and 5.0 colonoscopies/1000 population/year. This number has been steadily increasing and many units are under great pressure to increase throughput because of the Calman-Hine initiative⁸ on colorectal cancer. For most hospitals waiting lists for Colonoscopy are unacceptably long and exceed the capacity of clinicians to meet this demand. Training nurses to perform large bowel examination may be one logical way around this problem.⁹

It is highly likely that the requirements for endoscopic large bowel examination (flexible sigmoidoscopy and colonoscopy) will continue to increase and that at present there is a significant unmet demand. Some units are already performing 8 – 10 large bowel examinations per 1000 population where facilities allow (Dr P. A. Cann personal communication) and the average DGH should be planning for a similar workload (2000–2500 examinations/year) in terms of equipment and manpower.

d ERCP

The pattern of provision of ERCP is changing.¹⁰ A recent survey showed that a large majority of Acute Hospitals in the U.K. provided ERCP, with the provision moving away from Surgeons and Radiologists toward medical gastroenterologists. Approximately 0.75 examinations are carried out per 1000 population per year, with an average District General Hospital performing about 200 procedures. This is also an increase on figures relating to practice in 1992 when 0.54 examinations were performed per 1000 population.⁶ Three quarters of these patients will require therapeutic intervention.

e Endoscopic Ultrasound

At present, endoscopic ultrasound and enteroscopy are only performed in specialist centres, but these procedures are time consuming and may impact on the provision of routine lists.

Open Access Endoscopy

The rise in demand for all forms of endoscopy has led to an increase in the proportion of patients, particularly those requiring gastroscopy and flexible sigmoidoscopy, being investigated in 'open access' services.¹¹ The majority of referrals to open access services are being made using agreed guidelines and protocols.¹¹ There has been a steady increase in the overall numbers of open access procedures resulting in many Endoscopy Units reconfiguring their lists to accommodate more endoscopies being performed by hospital practitioners or Nurse Endoscopists (vide infra).

One of the original intentions of the Open Access Service was to reduce the waiting time for endoscopy and most units have protocols with their local GPs, which allow certain categories of patients to be investigated without referral to a hospital specialist. The benefits of open access gastroscopy in terms of patient management are clear¹² but so far there is little evidence to show any benefit in detecting malignancy at an early stage.¹³ Attempts are now being made to use H.pylori screening in younger patients without alarm symptoms to reduce the number of referrals. This 'test and treat' policy has so far, had little impact on the workload of Endoscopy Units but the potential to reduce referrals could be as high as 73%¹⁴ and should prove to be economically justified in younger patients. Over the age of 50 gastroscopy is cost effective¹⁵ providing the cost of gastroscopy is low (approx. £100).

The role of primary care endoscopy remains unclear although there are currently in excess of 25 primary care endoscopy units (R Stevens personal communication). There is very little point in establishing an off-site Endoscopy Unit, which only carries out a small number of sessions per week. Calculations on the cost benefit of these Units in terms of reducing waiting times for endoscopy, or more rapid diagnosis of serious pathology, need to be undertaken. Co-operation with the secondary care sector is vital if primary care endoscopy units are to continue, as this will ensure that standards are the same in both sectors. This should include regular audits of safety and outcome utilising the same referral protocols. In some hospitals it might be appropriate to have GP run sessions in the hospital unit rather than a peripheral unit which is under-utilised.

District General Hospitals will continue to provide all emergency endoscopy.

PLANNING OF OPEN ACCESS SERVICES

Open Access Services should fulfil the following quality criteria.

- 1 Referrals should be made using locally agreed guidelines and protocols, which fulfil long term Service Agreements.
- 2 Referrals should be made using standard Referral Forms which are suitable for audit and contain information which is required for a Minimum Data Set for Gastrointestinal Endoscopy (16)
- 3 Clerical and IT support for the Endoscopy Unit should be sufficient for family practitioners and patients to be informed of their appointment date and time within 7 working days of receipt of the referral. Notification to patients should include information about the procedure, possible complications and also arrangements for discharge from the Endoscopy Unit.
- 4 Clinical responsibility for the patient must be clearly defined.
- 5 The British Society of Gastroenterology Quality Standards for Informed Consent, should be used (17)
- 6 There should be sufficient trained staff available to speak to patients on arrival in the ward, and on leaving, so that they can be informed of the results of their endoscopy. Written results should be the gold standard for sedated patients and arrangements for follow up should be made before the patient leaves the Unit.
- 7 The Unit should have a computerised Endoscopy/Patient Record System in which data is recorded locally, stored centrally and is backed up on a regular basis, so that analysis for Clinical Governance purposes, is easily available. The Endoscopy report should be available to be returned to the referring doctor on the day of the procedure and ideally, this should be electronically transmitted.
- 8 Regular audit of the Open Access Service should take place.
- 9 Open Access Endoscopy should be performed by experienced, non-training grade staff, or by training grades under direct supervision.
- 10 The Unit should have clear Protocols for dealing with patients found to have serious pathology at open

access endoscopy. In particular, the software programme used to provide the endoscopy report should also have the flexibility to incorporate biopsy results and indeed provide reminders to chase biopsy results when specimens are taken for pathology.

The responsibility for arranging referrals for surgery or other investigations should be clearly defined and the effectiveness of the process should be audited on a regular basis.

- 11 Referring doctors should receive regular bulletins on the activities of the Open Access Service including waiting times, summaries of findings, complication rates and plans for development.

Summary

Ideally, all gastrointestinal endoscopy should take place in a single dedicated unit but it is possible that satellite units will increase in numbers. Gastroenterology Departments will need to work with their locality GPs to determine the best way of providing endoscopy services bearing in mind all the factors which influence patient acceptability. In some areas the distances patients need to travel may make community endoscopy units a preferable option.

It is extremely important that the quality of the diagnostic endoscopy service in Community-based Units, is exactly the same as that for the main hospital site and in particular, facilities for monitoring, provision of cardio-pulmonary resuscitation and recovery areas must be maintained to the highest possible level and equivalent to those in the main hospital. If these facilities cannot be provided, then endoscopy in community-based units should only be performed on unsedated patients. The Royal College of Anaesthetists are currently producing guidelines on sedation in a non hospital setting.

WORKLOAD OF ENDOSCOPY UNITS

The Royal College of Physicians¹⁸ has recently made specific recommendations on the workload of the average Gastroenterology Department dealing with a population of 250,000. An increase in the requirements for diagnostic and therapeutic endoscopy has resulted in recommendations that 8 notional half days per week, are required for gastroscopy based on the assumption that there will be 2500–3000 diagnostic and therapeutic upper GI endoscopies performed per annum. The assumption that the average Unit should perform 600–800 Colonoscopies per year and a similar number of flexible sigmoidoscopies (which would occupy another 8 notional half days) is an underestimate. The average DGH should be planning sufficient endoscopy time to allow for 12–14 notional half days, ERCP lists would occupy 2 notional half days. It should be noted, however, that most Consultants are unavailable to perform endoscopy for up to 10 weeks per year because of the requirements of annual leave, study leave and management responsibilities. Therefore the numbers of endoscopies that could be performed may need to be revised down to allow for this, particularly in units where there are single-handed gastroenterologists, allowing cover during holidays and study leave, in addition to sharing the burden of an increasing endoscopy workload.

These recommendations do not include the time that is required for proper assessment of in-patient referrals for endoscopy, nor do they include the increasing demand for percutaneous endoscopic gastrostomy (PEG). Whilst nurse endoscopy will overcome some of these problems, ultimate responsibility will remain with consultants and it is no longer acceptable to have single handed gastroenterologists in a DGH covering more than 100,000 people. The average DGH now requires 3 gastroenterologists and two endoscopy rooms able to run parallel sessions. A large DGH will require three endoscopy rooms with a correspondingly large recovery area.

NURSE ENDOSCOPISTS

In a previous report, The British Society of Gastroenterology concluded that nurses who were suitably trained and supervised would be able to carry out certain endoscopic procedures. Recommendations on standards as well as general considerations, such as medico-legal issues, risks and practical problems were outlined in the document, 'The Nurse Endoscopist'.¹⁰

The demand for endoscopy is now outstripping the capacity for medical endoscopists to provide the service required within a reasonable time scale. This has led to a variety of solutions, including the widespread introduction of Open Access Services, Primary Care Based Endoscopy and the introduction of Nurse Endoscopists.

In principle, the United Kingdom Central Council (UKCC) has no objection to nurses developing their professional practice, including training in gastrointestinal endoscopy. However, it specifically recommends that the nurses concerned are proven to be competent for the purpose and are mindful of their professional accountability for their actions.

The General Medical Council recognises and welcomes nurses undertaking new roles that may previously have traditionally undertaken by a doctor. However, the GMC also cautions that a doctor who delegates treatment or procedures to be performed by another person, must be assured that the person's training is adequate for the purpose and that the doctor retains ultimate responsibility for the patient's management.¹⁰

RECRUITMENT

Recruitment to a Nurse Endoscopy Post should be considered in a wider context than just the Endoscopy Services' requirement. The development of all Specialist Nurses should be part of local workforce planning arrangements and tailored to meet local and regional needs. Good workforce planning will ensure that the Nurse Endoscopist has a proper career structure and that their Continuing Professional Development is appropriately structured.

Five years ago, there were few nurses in the United Kingdom with sufficient experience to perform endoscopy unsupervised, and many Units have now taken on training their own staff to perform routine Gastroscopy and/or Flexible Sigmoidoscopy. A common dilemma is whether it is more suitable to train nurses from within the Endoscopy Unit, or recruit a trained nurse from outside.

There are now nationally recognised Nurse Endoscopy Training Units and currently approximately 75 nurses per year receive Accreditation.

DEVELOPMENT OF THE ROLE OF THE NURSE ENDOSCOPIST

The Joint Advisory Group (JAG) has identified minimum standards for Units training in Endoscopy (19). JAG expects Nurses undertaking endoscopy to train to the same criteria and standards as medical endoscopists. The development of the Nurse Endoscopist into a competent practitioner requires a linked approach to professional and academic developments in clinical endoscopy training. The Nurse Endoscopist should undergo defined apprenticeship under close supervision. National courses accredited with the ENB and BSG are available and Nurse Endoscopists should attend these during their initial training period and then subsequently fulfil national CPD requirements for Endoscopists.

The nurse Endoscopist should work closely with medical and surgical consultant Gastroenterologists ensuring that both medical and nursing supervision are identified with clear line management. The posts' role and responsibilities should be clearly defined to prevent confusion, but should be flexible enough to allow expansion and development. Nurse Endoscopists should work within Guidelines and use evidence based Protocols as part of a multi-disciplinary team. The undertaking of research, practice development and audit should be seen as fundamental to the post.

Careful consideration should be given to sessional commitments to endoscopy, and to remain competent, at least two or more sessions weekly should be allocated. Conversely, it is professionally inappropriate for a nurse to be used as an endoscopist full time. *It is equally inappropriate to expect a nurse to manage a caseload list in the endoscopy unit part time, and then return to duties as an endoscopy nurse for the remainder of the week.* The endoscopy nurse should be regarded as a GI Nurse Specialist, who provides appropriate care and services for patients with GI disorders and extends the role by taking on some of the routine follow up responsibilities such as a clinic for patients with PEG feeding tubes. In some units, nurses who perform endoscopy may be the most appropriate assistants for complex therapeutic procedures where non-training grade staff work single-handedly.

EMERGENCY ENDOSCOPY

The majority of requests for emergency or out-of-hours endoscopy involve the management of patients with acute gastrointestinal bleeding. Pressure to reduce the hours of work of training grade doctors and restrictions imposed by the European Working Time Directive, have led to the gradual disappearance of on-call rotas in District General Hospitals for patients with acute bleeds and the introduction of more structured arrangements. In those hospitals where an on-call rota for training grade doctors still applies, it is essential that Consultant Gastroenterologists are available to come to the Endoscopy

Unit, when necessary, to supervise the management of patients with acute gastrointestinal haemorrhage.

The NHS standards of service recommendations make it quite clear that District General Hospitals must have clear Guidelines and Protocols for the provision of emergency endoscopy, which should be available within 24 hours of admission/or request.

The British Society of Gastroenterology and Royal College of Surgeons' audit into the Management of Acute Gastrointestinal Bleeding²⁰ revealed that the mortality from gastrointestinal bleeding in District General Hospitals, tended to be confined to the elderly with multi system disease. This constant mortality rate of about 14% contrasts sharply with the fall in mortality that has been achieved over the last 20 years in younger patients with bleeding peptic ulcers, at least in part due to the success of interventional therapeutic endoscopy

In addition, there is strong evidence to show that the concentration of patients with acute gastrointestinal haemorrhage in Specialist Units, leads to a significant reduction in mortality which is achieved by an aggressive endoscopic approach and combined management between physicians and surgeons.^{21,22} The low mortality associated with gastrointestinal haemorrhage for patients under the age of 60 (1%), has led to several prospective studies on the requirement for hospital admission for all patients. There are now data to show that patients with uncomplicated upper gastrointestinal bleeding do not require admission, provided the patients undergo early Gastroscopy with the provision of a definitive diagnosis, and that bleeding has ceased.²³

What then is the best model for dealing with emergency endoscopy? Certain basic provisions are essential.

- 1 There should be an adequate number of properly functioning end viewing endoscopes with biopsy channels sufficiently wide to allow therapeutic intervention – often these will be large diameter twin channel instruments.
- 2 An experienced endoscopist – emergency endoscopy should not be performed by training grade doctors unless under direct supervision, or until they have achieved the required experience.
- 3 Emergency endoscopy should be performed in the main Endoscopy Unit with experienced nursing staff available – not as a rushed procedure, either in a side room on a medical ward, or in a main operating theatre, unless the endoscopy is being performed immediately prior to surgery.
- 4 Endoscopes are most likely to become blocked when used for patients with gastrointestinal haemorrhage – careful attention to mechanical cleaning of the instrument after use is essential. This is one of the main reasons for performing emergency endoscopy within Endoscopy Units during working hours so that experienced endoscopy nurses are available to handle the instruments after use.
- 5 Emergency endoscopy should be performed with facilities for therapeutic intervention available, i.e. injection needles, 1:10,000 adrenaline, sclerosants, banding apparatus and thermal methods of controlling haemorrhage.

The essential requirements for an emergency endoscopy service as stated above, suggest that only one or two models will be reliable and predictable. Most District General Hospital Endoscopy budgets do not provide sufficient funding for a seven day a week, 24 hour on-call service by endoscopy nurses, and as a consequence, endoscopies, out-of-hours and at week ends are performed as little as possible. Rota restrictions tend to lead to medical and surgical Consultant Gastroenterologists being called in to deal with these patients, often being required to use sub-standard equipment in operating theatre annexes. Clinical Governance Initiatives indicate the need to maintain quality at all times including a minimum level of service provision. This is supported by the Quality Assurance Protocols Initiative and 'ad hoc' arrangements to cover emergency admissions with gastrointestinal bleeding are no longer acceptable.

In the first instance, therefore, it is recommended that all hospitals carrying out emergency endoscopy attempt to establish an out-of-hours rota for their endoscopy nurses, so that emergency endoscopy can be performed in the best possible circumstances. A business case would need to be constructed to justify the additional expenditure.

Secondly, the European Working Time Directive determines that there should be a re-assessment of the working practices of Consultant Medical and Surgical Gastroenterologists. Attending the hospital out-of-hours and at weekends, to perform emergency endoscopy, must be recognised as part of their regular duties and be taken into account in constructing their job plans.

This will inevitably lead to the requirement for the appointment of additional Consultant Medical and Surgical Gastroenterologists in Units regularly performing emergency endoscopy out-of-hours.

Thirdly, endoscopists should no longer carry out emergency procedures or any other investigations, unless there is proper nursing and equipment support.

The concentration of patients in acute Gastrointestinal bleeding beds with dedicated endoscopic equipment and concentration of medical resources has led to a marked improvement in the mortality and morbidity of acute gastrointestinal haemorrhage in larger hospitals. There are still difficulties in providing ring-fenced beds, out-of-hours endoscopy nurse cover, and a socially acceptable rota of experienced endoscopists, particularly in smaller District General Hospitals, where the number of patients requiring out-of-hours endoscopy, may be as few as one or two per week.

One way of minimising the necessity for out-of-hours endoscopy is to provide a short session at the start of the day, in the main endoscopy unit. Patients admitted during the previous 24 hours could be endoscoped between 8 and 9.00 in the morning and the management of these patients would then not interfere with the running of subsequent lists during the day. However, this system requires a robust referral procedure in whereby referrals are received by the Endoscopy Unit early in the morning, rather than at lunchtime or later in the day. Individual units need to organise themselves to facilitate this arrangement.

This approach would lead to larger lists on a Monday morning to deal with week-end admissions and the Monday morning lists may need to be extended up to 9.30 a.m., but one hour should be sufficient in the remainder of the week. Admitting teams would know that patients could be endoscoped the morning after admission, and should manage their patients accordingly. The endoscopy unit's day to day work would be more easily managed if emergencies were dealt with earlier in the day.

This concentration of emergency work at the start of the day would also allow a rota to be established for experienced endoscopists and would provide a focused training opportunity for medical and surgical trainee Gastroenterologists. Audit of the Management of GI Bleeding would also be facilitated

Where does this model break down? Clearly, difficulties will arise for patients admitted in the early part of the week-end although some hospitals do have a routine Saturday morning endoscopy list to deal with patients with gastrointestinal haemorrhage admitted on a Friday evening. We would suggest that GI Endoscopy Units prospectively audit the true requirement for emergency endoscopy on Saturdays and Sundays, before making formal provision for weekend endoscopy lists.

This report deals with the organisation of GI Endoscopy Services in District General Hospitals – Teaching Hospitals and Specialist Units dealing with tertiary referrals with gastrointestinal bleeding – particularly Liver Units, will require different arrangements to deal with the large number of patients with variceal bleeding that they receive.

EQUIPPING DGH GASTROINTESTINAL ENDOSCOPY UNITS

- a The numbers and types of endoscopes required by DGH Units, will be linked to the mix of work performed and the restrictions placed on throughput by the minimum immersion times required for cleaning and disinfection, which govern the number of cases that can be accommodated on a list.

As previously stated, the average District General Hospital serving a population of 250,000, would normally spend up to 14 notional half days per week carrying out elective procedures in addition to 1–2 ERCP lists (taking place either in the x-ray department or in a separate endoscopy room). In addition, there will be requirements for emergency procedures.

The minimum endoscope requirements to service these lists are as follows:

- 6 Gastrosopes
- 4 Colonoscopes
- 2 Flexible Sigmoidoscopes
- 3 side-viewing duodenoscopes.

In addition, a paediatric colonoscope will be required in Units dealing with large numbers of children, and this instrument is often helpful negotiating the sigmoid colon for patients with advanced diverticular disease and/or distal colonic strictures.

Sufficient washing machines to process at least 4 instruments at a time are necessary to maintain throughput and avoid delays between patients.

We recommend video endoscopes because of the enhanced image quality available with these instruments as well as the ability to teach and inform other members of the GI team.

b *Endoscope Accessories*

The increasing amount of therapeutic work carried out via endoscopes, re-enforces the requirement for Units to have a wide range of accessories available, which should include:

Oesophageal Disease

- (i) Bougie Dilators, through the endoscope balloon dilators and Achalasia Balloons.
- (ii) A wide range of oesophageal metal stents, covered and uncovered.
- (iii) Banding and injection sclerotherapy equipment for dealing with oesophageal varices.
- (iv) Foreign body retrieval forceps.
- (v) Large spiked forceps.

Diagnosis and Treatment of Stomach Lesions

- (i) Polypectomy snares.
- (ii) Needles for injection of adrenaline and saline for submucosal stripping procedures and for the control of bleeding.
- (iii) Biopsy forceps (multiple of varying types).
- (iv) Balloon Dilators for pyloric strictures.
- (v) Pyloric canal stents.

ERCP-Related Equipment

- (i) Wide range of injection cannulae, including fine and metal tipped cannulae.
- (ii) A range of sphincterotomes, including pre-cut needles, pre-cut knives, and Sharks-fin Sphincterotomes for patients with Bilroth II Gastrectomies.
- (iii) Biliary dilatation balloons for dealing with strictures and for Sphincteroplasty.
- (iv) Biliary metal stents.
- (v) Mechanical Lithotripters.
- (vi) Plastic stents in a range of lengths and sizes.

Colonoscopy Associated Procedures

- (i) Biopsy Forceps.
- (ii) A wide range of snares including hexagonal and rotating snares.
- (iii) Injection needles for lifting sessile polyps, injecting India Ink and for controlling colonoscopic focal bleeding.
- (iv) Through the endoscope balloons for dilating colonic strictures.
- (v) Clipping devices for dealing with bleeding polyp stalks.

Desirable Equipment

Argon laser
Endoscopic ultrasound
Argon Plasma Coagulator
High pressure washers

Cleaning Equipment

COSSH regulations on the cleaning and disinfection of endoscopes specify the requirement for careful mechanical cleaning of the endoscope before inserting into automatic washers where the minimum immersion time should be 10 minutes. Standards for washing machines were discussed in the BSG report 'Cleaning and Disinfection of Endoscopes'.²

This minimal immersion time means that an endoscope will essentially be out of action for 30 minutes whilst being cleaned, washed, disinfected and washed again. Therefore to avoid delays, at least four gastroscopes will be required for a 10–12 patient gastroscopy list in a single room and three colonoscopes for an ordinary colonoscopy list.²⁴

Cleaning and Disinfection of Accessories

A recent European Community Directive requirement for single use disposable accessories has created some problems for Endoscopy Units and certainly increased costs. It is recommended that Endoscopy Departments budget for single use biopsy forceps, injection needles, snares and sphincterotomes following the manufacturer's recommended practice in the use of all these accessories.

Where accessories can be re-used, a close working relationship should be established with the hospital's CSSD Department, to ensure that accessories are dealt with properly and that there are agreed Quality Standards for packaging and processing, particularly of accessories that are autoclaved.

Equipment Purchase & Service Contracts

Significant discounts can be achieved in the purchase of endoscopes, e.g. in District General Hospitals merging into larger Trusts, or by individual Units clubbing together. Careful attention should be paid to the requirements of the European Union, in terms of invitations to tender for the provision of endoscopy equipment, option appraisal of bids to tender and leasing contracts that may be established.

DESIGN OF THE ENDOSCOPY UNIT

The last British Society of Gastroenterology Guidelines on the design of Endoscopy Units, were published in 1990.²⁵ In addition, specific Guidelines on the cleaning and disinfection of Endoscopes have been provided and these include recommendations on how Units should be designed to handle the toxic agents used in disinfection.

District General Hospital Endoscopy Units have to deal with the passage of an average of 100–150 patients/week through the Unit, including emergency endoscopy, complex therapeutic procedures and in many cases, ERCP. In these circumstances, full time clerical staff working in a reception area, closely linked to a recovery area containing a mixture of 8 to 10 trolley beds and an equal number of reclining chairs, seems to be the optimum arrangement. The recovery area should be fully equipped to allow all sedated patients to be monitored using pulse oximetry. Facilities for measuring and monitoring blood pressure should be readily available. Piped oxygen should also be accessible for each trolley/bed.

The Unit should be self contained and there should be ease of movement of patients from the trolley/reclining chair area to the Endoscopy Unit, using modern trolleys which can be tilted and can be 'head-up' or 'head-down' and allow patients to be easily turned during Colonoscopy and ERCP.

Larger hospitals will need to have at least two (possibly three with bronchoscopy) endoscopy rooms working side by side. Ideally, one of these should provide for high quality pulsed digital fluoroscopy for ERCP, with appropriate resuscitative facilities, and x-ray support. The endoscopy room should also have piped oxygen and suction. One room may need to accommodate endoscopic ultrasound as this investigation becomes more available.

Pulse oximetry, piped oxygen and suction, electronic blood pressure cuffs, and facilities for ECG monitoring should be made available in the recovery area as well as in the endoscopy rooms.

All units should have full resuscitation facilities available including a cardiac defibrillator and emergency drugs tray which includes any drugs which might be needed for a cardiac arrest within the department.

The minimum size for an ordinary endoscopy room, is approximately 7.5 metres x 3.5 metres. This allows a standard trolley to be turned within the Unit, the siting of a light source/video processor on one wall and fixing of a video monitor opposite. In a room of this size cupboards for hanging endoscopes can be provided together with a reasonable amount of work surface. A separate cleaning room is required with washing machines and extraction facilities to satisfy COSSH requirements. The endoscopy room should be cabled for local area networks, wide area networks and ISDN.

Care should be taken to ensure sound from the endoscopy room cannot be transmitted to the patient waiting/recovery areas. Windows are not required and may positively be a disadvantage when procedures requiring transillumination are necessary (eg PEG and Colonoscopy)

Lighting

Although windows are not required in the endoscopy room, these are advantageous elsewhere and recovering patients should have access to natural light. In the endoscopy room itself there should be facilities to have varying light levels ranging from bright to very subdued. Dimmer lights are ideal for background lighting when the main lights have been switched off.

Security

Endoscopy units house a great deal of expensive equipment and should therefore be regarded as areas requiring a high level of security. This can be provided during the working hours by having a reception area manned by a full time clerk. At other times the unit must be secured with high quality door locks or code locks which will prevent easy access to an intruder.

STAFFING OF ENDOSCOPY UNITS

A core of highly trained, permanent staff is essential with clear lines of accountability to experienced management. The endoscopy service, which might also provide staff

and facilities for bronchoscopy and possibly cystoscopy, should have its' own budget and be managed by a designated Senior clinician working closely with the senior non medical manager in the department with proper support from the local Trust Finance Department.

Precise recommendations on the levels of staffing will depend on the model of service provided, the following are provided as examples. All nurses should have received basic life support training.

MODEL A

- Patients attending the Endoscopy Unit will be admitted by an Endoscopy Nurse who will follow the patient through the Department. Assuming that the average Gastroscopy list will contain 10–15 patients, two nurses will be required in the reception/trolley area.
- In the Endoscopy Room, a minimum of 1 qualified nurse and 1 trained assistant will be required, with a further nurse/endoscopy technician being responsible for cleaning and disinfection.
- The recovery area should have at least 1 qualified nurse and trained assistant to manage patients who are returning from the endoscopy room
- Clearly, these numbers of staff will need to be increased for Units that have two rooms in action running parallel lists. Under these circumstances the recovery nurse levels will be the same but 1 extra qualified nurse and 1 extra trained assistant will be required for the second room.
- Allowing for holiday/annual leave and sick leave, the average department running a single endoscopy room, will require a minimum of 6 wte staff, one of whom will be the senior nurse responsible for managing the department. These numbers will need to be increased to 9 wte staff in Units where two rooms are running parallel lists on a regular basis.
- For ERCP the number of nurses and trained assistants required per room is 3.
- In Departments in which nurses undertake endoscopy, additional nursing hours will be required to replace the routine work that would have been undertaken by the nurse endoscopist.
- In this self-contained model, the Unit will usually have a devolved budget for the purchase of endoscope accessories and to cover the revenue costs of staff.
- As stated previously, it is likely that economies of scale would be achieved by merging the purchasing requirements of separate DGH Departments, but the Endoscopy Unit should have a clear policy for the repair and replacement of endoscopes, with rolling capital requirements being clearly identified, and included in business plans.
- It is extremely important that the skill mix ensures that all the staff are able to assist with complex procedures.
- The day to day running of the Unit should be in the hands of a Senior Nurse Manager who would usually be a highly experienced endoscopy nurse.

- It will be the responsibility of the Consultant Gastroenterologists in the Department and the Senior Nurse to ensure that endoscopy is conducted safely by properly trained staff and that the quality criteria stated previously, are fulfilled. Regular audit must take place, and it is strongly recommended that the Department's Management Committee meet at least on a monthly basis to ensure that quality control and budgetary planning are properly performed.

MODEL B

An alternative arrangement for endoscopy is that this takes place in a hospital's Day Unit where the admission of patients is dealt with by permanent Day Unit staff, but the Gastrointestinal Endoscopy takes place in a separate room and this is where the Endoscopy Unit staff will be based. The requirements for permanent endoscopy staff in this Model, are slightly less than Model A, but would still require at least 4 wte, and is probably less satisfactory than Model A.

FACILITIES FOR TRAINING

Specialist Registrars in Gastroenterology and in General Surgery now require formal training in gastrointestinal Endoscopy.¹⁹ The Joint Advisory Group (JAG) has produced specific recommendations on the quality criteria that Endoscopy Units will have to fulfil to be recognised as training departments. Probably the most important aspect of training is the direct supervision of trainees by experienced endoscopists, but "hands-off" experience can be gained, both in diagnostic and therapeutic procedures. Training departments, as a minimum, will require video endoscopy systems, and secondary monitors in adjacent seminar rooms or offices, usually with voice linkage.

Trainees are required to keep an annual record of their endoscopic experience and all training units must provide adequate computerised endoscopy record systems. Increasingly these will be systems linked to the hospital's main patient Master Records System rather than standalone PCs.

Ideally, it is recommended that the offices of the Gastroenterology Department will be based close to the Endoscopy Unit and here there should be a mini library containing up to date Gastroenterology Journals and textbooks, and again a PC Workstation linked to Medline, the Cochrane Database and the Internet.

Liaison with other departments

We recommend that at least fortnightly meetings should take place to review the Department's x-rays and biopsy specimens and ideally there should be a departmental meeting jointly held with the gastrointestinal surgeons, pathologists and radiologists, at least once per month. There should be clear responsibility for the organisation of departmental meetings, which should form the basis of departmental audit, evidence-based practice and clinical governance. Indeed in larger departments, a clinician with specific responsibility for clinical governance should be identified. Collaborative peer review with Colleagues in adjacent units should be encouraged.

OTHER GASTROENTEROLOGICAL SERVICES TO BE PROVIDED IN THE DISTRICT GENERAL HOSPITAL

The provision of these services will depend on the specific needs of the local population and of the Physicians and Surgeons with a GI interest. What needs to be provided will also depend on the availability of other procedures at Regional and Sub-Regional level.

All Gastroenterologists require access to Oesophageal PH and Manometric testing. In many regions these are concentrated in one or two centres which perform a sufficient number of procedures to provide reliable and reproducible results. Many District General Hospitals do not have this facility, but have good relationships with a regional centre, which can provide a rapid reliable service.

The provision of Oesophageal PH and Manometric testing within a DGH will almost invariably require additional funding for a Specialist Nurse and/or Technician. These personnel will also often perform Hydrogen breath testing on these Units.

Many District General Hospital Departments now provide carbon-13 urea breath testing for H.pylori, although the funding of this service often depends on research support. It is recommended that negotiations take place with Primary Care Groups to build the cost of H.Pylori testing into Service Agreements

Core Services provided by Service Departments

- 1 A full range of barium studies should be provided along with diagnostic and therapeutic ultrasound, spiral CT scanning and easy access to MRI.
- 2 Isotope studies – these will include gastric emptying, SEHCAT absorption, white cell and HMPAO scanning.
- 3 *Pathology*
Close links with Histopathologists and Microbiologists are essential, with provision for assessments of specimens obtained by biopsy and cytological examination. Gastroenterological surgeons will also require access to frozen section techniques.
- 4 *Microbiology*
This department should provide facilities for the investigation of infectious diarrhoea, culture of intestinal and liver biopsies and serological investigation of gastrointestinal and hepatic disease.
- 5 *Biochemistry/Haematology*
These departments will be closely involved in the investigation of gastrointestinal diseases, including hormone secreting tumours, haemochromatosis, and the monitoring of the response to treatment of patients with malignancy.

VISION OF GASTROINTESTINAL AND RELATED SERVICES IN THE NEW NHS

All Clinicians are now required to take part in management and Gastroenterologists are no exception.

Clinicians within the department should be identified who will be responsible for the organisation of business planning and contract negotiations. It should be recognised that these skills are an essential part of the department's activities.

THE NEW NHS²⁶

Gastroenterology Units will be required to have clear guidelines and protocols agreed with their Primary Care colleagues for the management of most common gastrointestinal conditions and these are likely to include the implementation of care pathways. Gastroenterologists will also have to work closely with their colleagues, both at Health Authority and hospital level and on drug and therapeutic committees to ensure that funding is identified to allow the introduction for newer treatments for which there is good evidence to support an effective role. In this respect, the cycle of business planning becomes even more important and it is likely that Gastroenterology Units as with all other departments, will have to prioritise the investigations and treatment that they can provide within their budgets. It is to be hoped that these can be agreed on a national basis.

In future, it is probable that the organisation of services will relate to populations of at least 500,000. In these circumstances, endoscopy sub-specialization is likely to occur with not all consultants performing ERCP or Colonoscopy. Closer co-operation between neighbouring acute hospitals will be necessary with the sharing of expertise and equipment, and mutually supportive peer review and audit.

DEMAND FOR ENDOSCOPY SERVICES

As the numbers of trained endoscopists and endoscopy units have increased in the last decade, the demand for Gastroscopy in particular has increased inexorably, with this procedure now being the most commonly day case procedure constituting 12% of all NHS day case admissions.²⁷ Approximately 530,000 endoscopies are performed each year at a cost to the NHS of £50 million. The demand for endoscopy and the pressure placed on outpatient clinics by referrals with dyspepsia, have led to the widespread introduction of Open Access Gastroscopy, with many Units also offering Open Access Flexible Sigmoidoscopy.¹¹

These services have proved to be very successful in reducing waiting times for Gastroenterology Outpatient Clinics, but have placed a considerable burden on Endoscopy Units having to deal with increasing demand, with most units reporting normal Gastroscopies in 25%–40% of patients undergoing endoscopy.²⁸

The introduction of Guidelines and Protocols governing referrals for endoscopy, should lead to a reduction in the proportion of negative findings. It is strongly recommended that Endoscopy Units work very closely with their local Health Authority and Primary Care Groups to establish clear criteria for referral using the best available contemporary evidence.

APPENDIX⁵

Bronchoscopy and Endoscopy

Emergency general medical care requires the support of upper gastrointestinal endoscopy, sigmoidoscopy, colonoscopy and bronchoscopy. Each acute general hospital must have a fully equipped endoscopy unit, staffed by experienced nurses or operating department assistants, with apparatus for continuous cardio-respiratory monitoring. There should be mobile equipment for use elsewhere in the hospital. The use of anaesthetic services must be provided for and built into contracts for this service.

Endoscopy should always be available within twelve hours of request. There should be a rota of available and experienced physician or surgeon endoscopists and experienced endoscopy assistants which identifies their 24 hour availability. Whenever possible, informed consent must precede endoscopy/bronchoscopy.

There should be an endoscopy unit portering service for the protection of sedated and often ill patients and their rapid transfer back to a safe environment.

A record of endoscopy findings must be made on the patient's notes, as should a record of complications of the endoscopy. A system must be in place for making the results of endoscopy immediately available to the referring medical team.

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