The Royal College of Pathologists

Guidelines on autopsy practice

Report of a working group of
The Royal College of Pathologists

September 2002

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This document was placed for consultation on the Fellows and Members Area of The Royal College of Pathologists website from 10–30 April 2002. 27 replies were received. These were forwarded to the Working Party who found them very useful in preparing this final draft of their report, although inevitably some contentious issues remain.

Dr John A Lee
Director of Publications

The Royal College of Pathologists
2 Carlton House Terrace
London
SW1Y 5AF

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CONTENTS

EXECUTIVE SUMMARY

1 The autopsy has been relatively neglected in recent appraisals of histopathology practice, and working practices have been significantly and negatively affected by recent public concern over organ retention. New guidelines over the whole area of autopsy practice are urgently required.

2 Whilst the processes of audit and raising of quality standards in diagnostic surgical histopathology have proceeded apace, there has been little pressure to raise standards of autopsy performance and reporting. Quality issues are central to these Guidelines, with the proposal of uniform minimum datasets, enhanced feedback to clinicians and relatives, promotion of mortality meetings and clinical audit, and other measures to raise the profile of the autopsy in clinical practice. The end result must be the improvement of patient care.

3 There is wide variation in autopsy performance and reporting practices, related to inconsistent operation of the Coronial system across England and Wales, and lack of clarity in the law on human tissues. As there is an ongoing consultation over these important issues, it is not possible rapidly to move to a set of universally agreed 'best practices'. In these Guidelines, the distinction is made between 'best practice' (i.e. may do) and 'acceptable practice' (must do). Autopsy standards should continue to rise by example.

4 Since the majority of adult autopsies, and a significant proportion of paediatric autopsies, are done at the request of a Coroner or Procurator Fiscal, much attention is given to Coronial matters and working within the system as it currently stands. There are major anomalies within the Coronial system, particularly when applied to clinical governance. The College is working with the ongoing Home Office Review of Coroner Services to provide the bases for consistent and high quality autopsy practices. These should address all questions that may be posed by interested parties regarding a death, ultimately answering the question 'has this autopsy satisfactorily explained how this patient died?'

5 Sub-specialisation in diagnostic histopathology and cytopathology is proceeding, and raising the standards of reporting in line with the demands of clinicians and the public. The same trend should continue in autopsy practice (it already exists for paediatric and forensic practice, and to some extent in neuropathology). Increased audit and input into clinical governance from autopsy data will require a more focused approach from pathologists. Pathologists will need to recognise their limitations in expertise and be more prepared to seek assistance in difficult and unusual cases.

6 Autopsies on patients with significant communicable (infectious) diseases cause many problems in mortuaries, and performance practice is highly variable over the UK. These Guidelines provide a rational approach to infectious cases with protocols for risk assessment and reduction.

7 The job plans, working practices and status of Anatomical Pathology Technicians (APTs), who are vital contributors to the autopsy service, need review and regulation. These are not addressed in detail in these Guidelines, but APTs must be brought into a regulating body as a profession allied to medicine.

1 REMIT

1.1 In 1998, The Royal College of Pathologists commissioned a Code of Practice for autopsies in the UK. The original scope was:

- legal and ethical aspects
- standards for health and safety
- autopsy reports
- autopsy and audit
- the role of Anatomical Pathology Technicians (APTs)
- aspects of medico-legal autopsies.

1.2 It is evident that the adult autopsy has not received the same attention within the College as has surgical pathology and cytopathology in the last two decades, and that there are strains in the relationship between the medico-legal system, hospitals and pathologists.

1.3 The following Guidelines draw on previous work by The Royal College of Pathologists and other organisations in the UK and abroad. The College's organ retention guidelines were published in March 2000 and are being revised; this aspect is not addressed in detail in these Guidelines.

1.4 Training in autopsy pathology is becoming more problematic as the number of consented autopsies continues to decline. This is not addressed in detail in these Guidelines; another College committee is considering the issue.

1.5 Recently, attention is being paid to 'minimally invasive autopsies', which include:

- post-mortem magnetic resonance imaging (MRI) as replacement for autopsies
- percutaneous needle biopsies of specific organs after death
- laparoscopic investigations post-mortem with tissue sampling
- 'mini-autopsies' where extensive organ sampling or organ removal can be performed through a limited incision (e.g. 15 cm long in the upper abdomen).

1.6 Apart from the MRI analyses, the intentions are to increase the number of consents for examinations, albeit limited, by causing less distress to the next of kin compared to the standard autopsy. The College welcomes proper studies of these proposed procedures, with formal validation. Where such a minimally invasive procedure would be sufficient to answer a specific question posed by clinicians after a death in hospital, such alternatives should be considered by the pathologist when advising clinicians who are seeking consent for autopsy.

1.7 A later edition of these Guidelines will include sets of minimum recommended histology samples for standard clinicopathological conditions. Furthermore, recommended non-histology sample sets needed for diagnosis in certain cases will be outlined (i.e. samples for toxicology, microbiology, serology, haematology and clinical biochemistry).

1.8 Remuneration aspects of the medico-legal autopsy are not included in these Guidelines. Such considerations will figure in the Home Office Review of Coroner Services and debate over the new consultant contract.

2 THE IMPORTANCE OF THE AUTOPSY AND OVERVIEW OF THESE GUIDELINES

2.1 Our understanding of disease and developments in medical practice over the last 150 years has depended crucially on autopsy findings. In the UK, the rates of consented autopsy of adults have declined markedly over 30 years, whilst the number of medico-legal autopsies is roughly constant. In England and Wales each year, about 130 000 autopsies are performed. The great majority of these are on adults and, of those, more than 90% are authorised by a Coroner. Most of the fetal, perinatal and paediatric autopsies are consented autopsies and increasingly are performed by specialist histopathologists.

2.2 As The Royal College of Pathologists of Australasia states: "The autopsy is an investigation which, amongst other things, has major public and private therapeutic consequences. This concept can get lost in the reduction of the autopsy to the limited purpose of finding the cause of death and filing the report. An autopsy is a significant event, and the community has a right to expect that systems are developed, with community input and understanding, to ensure that the substantial potential benefits are being realised and that it is not meeting only narrowly defined needs".

2.3 The autopsy is a professional activity that requires extensive knowledge and technical ability in order to identify and interpret important findings within a wide range of clinical contexts. The central role of the medico-legal autopsy in the investigation of death necessitates the highest possible standards of practice. Similarly, the clinical autopsy represents one of the few occasions when clinicians elect to submit their management of patients to detailed assessment by other doctors. Many studies published have shown significant discrepancies between ante-mortem and post-mortem diagnoses – a situation that has not essentially changed in a century.

2.4 Pathology has been at the forefront of the introduction of quality control into medicine and it is time for formal quality control in autopsy practice. Although the basic technique of the autopsy has not changed, it still has a vital role in 21st century medicine as a means of studying new disease entities, evaluating new therapies and providing information to families of the deceased. The strengthening of clinical governance and audit has, in principle, enhanced the status of the autopsy. The confirmation of a 'known' clinical diagnosis is no less important than the demonstration of discrepancy between ante-mortem and post-mortem diagnosis; both are essential to confidence in clinical diagnosis and the accuracy of investigations performed in life.

2.5 The teaching of medical undergraduates and postgraduates through the autopsy still has an unrivalled impact and immediacy.

2.6 It is important that the autopsies that are undertaken now are performed to high standards and that there is consensus among pathologists, their employers and the public over what those standards comprise. The comprehensive reviews of pathology practice extend also to the autopsy: there is need for review and a formal set of guidelines on autopsy practice.

2.7 Practice guidelines represent recommendations that identify a range of voluntary strategies for the management of a specific problem and that also allow for practice variations due to individual circumstances. Standards differ from guidelines in that practice variation is not expected. Variation in autopsy practice is to be expected as each autopsy involves the incorporation of substantial patient-specific information, and the product is the answer to patient-specific questions about that death. Thus, practice guidelines rather than standards are desirable. However, The Royal College of Pathologists holds that in certain aspects – for example, autopsy reports – there are certain minimum standards (minimum datasets) that should be followed.

3 CONSENT ISSUES

3.1 Since the organ retention issue became public, most hospitals have redrafted their autopsy consent forms and refined the consent procedures to make them more informed. A model consent format was issued with The Royal College of Pathologists' March 2000 organ retention guidelines. NHS national-use consent forms relating to consented and Coronial autopsies on children and adults have been 'piloted' and the results are now under discussion.

3.2 Obtaining consent for the autopsy, and conveying information on the issues related to the autopsy, must be in the context of a properly resourced hospital-based multidisciplinary bereavement service, tailored to the local circumstances.

3.3 This service should be available to families involved with Coroners' autopsies as well as to consented autopsies although, where an independent autopsy and/or inquest may be required, the Coroner should take the lead in liaising with the family.

3.4 The pathologist should be a core member of the bereavement service to ensure that:

- all staff are aware of the ethical and legal framework within which they work when dealing with the deceased and their next of kin. This includes the duty of doctors to notify the Coroner of certain categories of death
- the content of relevant information leaflets is complete and accurate
- the pathologist is available, if required, to meet with families to discuss issues surrounding consent, the autopsy and its results and consequences
- the induction and education of health professionals involved in the service is assured
- the bereavement service is audited.

3.5 A guiding principle should be that 'the family comes first' as the autopsy has the potential to play an important role in bereavement counselling. When the family's needs are met, wider issues such as the donation of organs and tissue for later education and research can be raised (and may be raised by the family first).

3.6 The family should be aware that the autopsy itself is often only the first step in the investigation of a death. They need to know that further investigations and clinicopathological correlation are often required before they can expect to have a full discussion with the deceased's clinicians. Feedback to the family must be presented as an option if they wish it. The realistic timeframe within which this is expected to happen should be made clear. The family should be informed that tissue slides and blocks from the autopsy will be archived in departmental files.

3.7 Before commencing a consented hospital autopsy, the pathologist must be satisfied that a form setting out the wishes of the relatives of the deceased has been completed, and he or she must abide by those wishes. If it appears to the pathologist that those wishes are incompatible with addressing the questions that the autopsy seeks to answer, he or she should point this out to the health professional who obtained the consent and seek clarification, or consider contacting the relatives directly. If it is not possible to provide the information required within the parameters of the consent, the pathologist should decline to perform the autopsy.

3.8 Where it appears to the pathologist, whether from the clinical history or from additional findings at autopsy, that the death should be reported to the Coroner or Procurator Fiscal, the pathologist should ensure that this is done, to permit the Coroner the opportunity to assume jurisdiction.

3.9 Where the Coroner (or Procurator Fiscal) requests the pathologist to carry out a post-mortem examination and it appears to the pathologist from the information available to him or her (but not necessarily to the Coroner) that, in fact, the death does not fall within the Coroner's jurisdiction, then the pathologist must discuss that case further with the Coroner, and he or she may decline the request to perform a post-mortem examination, pointing out that a consented post-mortem examination would be more appropriate.

3.10 Where it appears to the pathologist that an autopsy will add nothing of significance to the Coroner's inquiry, other than to obtrude on a family's grief, then the pathologist should discuss the case with the Coroner. He or she should decline to perform the autopsy unless the family is content for the autopsy to continue.

3.11 **Photography**

In medicine and pathology, there are three main purposes to photography:

- for treatment (e.g. monitoring leg ulcers)
- for medical education, teaching, documentation at autopsy, etc.
- for public domain usage, including publication.

Anonymity of images or appropriate consent is critical; this is important given the emphasis laid on distribution of images from autopsies for purposes of external quality assurance (EQA) and education.

The General Medical Council (GMC) has recently produced guidance regarding all types of recordings of patients, carried out for any purpose. The relevant sections are reproduced hereon:

> "'Recording' means originals or copies of video and audio recordings, photographs and other visual images of patients. A 'recording' does not include pathology slides containing human tissue (as opposed to the image of such a slide), or CCTV recordings of public areas in hospitals.
>
> "Part 2: Recordings for which permission is not required
>
> Paragraph 5. You do not need to seek separate permission to make the recordings listed below. Nor do you need consent to use them for any purpose, provided that, before use, the recordings are effectively anonymised by the removal of any identifying marks…
>
> - images taken from pathology slides…
> - images of internal organs…
>
> "Paragraph 6. Such recordings are unlikely to raise issues about autonomy and will not identify the patient. It may nonetheless be appropriate to explain to the patient, as part of the process of obtaining consent to the treatment or assessment procedure, that a recording will be made.
>
> "Part 3: Recordings for which permission is required
>
> Paragraph 8. When conducting a hospital post-mortem examination, you must seek permission from a close relative or carer before making any recording from which the deceased may be identifiable. If the death is the subject of a medico-legal investigation, the proposed recording should be discussed with the Coroner or Procurator Fiscal (in Scotland) who has authorised the investigation.

"Paragraph 24. You must not make recordings for use in publicly-accessible media without written permission, whether or not you consider the patients to be identifiable. 'Publicly-accessible' media includes medical journals. The only exceptions to this are outlined in Part 2 above."

4 MEDICO-LEGAL ASPECTS AND AUTHORISATION

4.1 General Coronial issues

4.1.1 The Guidelines address these issues in the particular context of the Coronial system of England and Wales. While much of this section will apply to Scottish practice, there is no specific effort to examine or to comment on the Procurator Fiscal system.

4.1.2 In the year 2000, 124 500 autopsies were performed in England and Wales after authorisation by a Coroner. Some 37% of all deaths (a rising proportion) were reported to a Coroner, and of these, 62% (a falling proportion) resulted in an autopsy.

4.1.3 Between 1995 and 1998, The Royal College of Pathologists, the Department of Health for England and Wales, the Coroners' Society and the Home Office consulted on aspects of the Coronial system that pertained to autopsies. The draft document has been reviewed and informs these Guidelines.

4.1.4 The autopsy in the current Coronial system is performed primarily to identify unnatural and violent death, and the pathologist has a crucial role in assisting the Coroner in determining the need for inquest and the formulation of cause of death.

4.1.5 The interaction of the Coronial system with hospital deaths, for example determining what categories of hospital deaths are 'unnatural' and require inquest, is both complex and subject to large variations across England and Wales. Clinical governance is an emerging factor in this equation, which must be explored thoroughly in the forthcoming Home Office Review of Coroner Services. The autopsy is frequently a crucial component in the investigation of such deaths and the pathologist must perform the autopsy to the highest standard and be aware of both the importance and limitations of his role.

4.2 The pathologists who perform Coronial autopsies

4.2.1 All Coronial autopsies should be performed by, or be under the supervision of, histopathologists on the GMC specialist register. Trainees (GMC-registered) need to have exposure to Coronial autopsies: they should be able to do them under the supervision of a trained histopathologist, with the Coroner's agreement. The supervising pathologist is responsible for the conclusions drawn from the autopsy.

4.2.2 Pathologists trained abroad who have not taken the MRCPath examination, or whose eligibility for specialist registration has not been considered by The Royal College of Pathologists, must have their competence in autopsy practice considered carefully by the Appointments Committee for any post that includes Coronial autopsies as part of the job description.

4.2.3 Pathologists should hold contracts with the hospitals in which they perform autopsies via the Coroner, to satisfy health and safety requirements.

4.2.4 When a new pathologist is authorised to perform Coronial autopsies, there must be an up-to-date CV on the Coroner's (and Procurator Fiscal's) files. The College will also have a list of pathologists with Certificates of Completion of Specialist Training (CCST); this may become particularly relevant if future generations of trained pathologists opt not to be examined in and perform autopsies. Ideally, those involved in medico-legal autopsy work would have a further qualification in forensic pathology.

4.2.5 Histopathologists performing Coronial autopsies should have formal links or contracts (honorary or otherwise) with institutions such as hospitals or medical schools, in order to ensure that histopathological and other laboratory facilities are available, so that a case may be investigated fully. Such laboratories should be accredited, preferably by Clinical Pathology Accreditation (UK) Ltd (CPA) or another organisation accrediting to similar standards.

4.2.6 Certain categories of autopsy should be performed by histopathologists with training and expertise in specialised areas. If necessary, such expertise should be called in for a second opinion. The pathologist must recognise the limitations of his expertise and, if a case goes beyond those limitations, must seek the assistance of an appropriate accredited or experienced specialist. The pathologist must point out to the Coroner where the autopsy examination requires special skills and should decline to perform any autopsy for which he or she does not possess those skills (see Section 10, Specialised autopsies).

4.3 An 'approved list' of pathologists for different categories of autopsy

Coroners have the right to choose any registered medical practitioner they want to perform a particular autopsy. The Royal College of Pathologists believes that Coroners must use histopathologists with adequate training and experience in autopsy work and be encouraged to call upon particular specialists for particular types of autopsy. The Coroner's usual pathologists can advise on the right specialist where appropriate. The College should consider the development of a list of specialist pathologists and making this available to Coroners.

4.4 Where Coroners' autopsies are performed

4.4.1 For in-hospital deaths of adults, the autopsy should usually be carried out in the same hospital mortuary to facilitate communication between pathologists and the clinicians who looked after the patient in life. The clinical team should be informed by the Coroner beforehand of the time and place of the autopsy, so they have the option to attend. For logistic reasons, perinatal and paediatric autopsies are frequently referred to a regional specialist centre.

4.4.2 Where it is thought desirable that the pathologist performing the autopsy should not be a Trust colleague of the clinicians involved (Coroners Rules 1984, rule 6), i.e. there may be a conflict of interest, a choice is to be made: an 'outside, independent' pathologist possessing appropriate skills may come to the hospital or the body may be transported to another appropriately equipped mortuary for autopsy by the appropriately skilled 'independent' pathologist.

4.4.3 Whatever arrangements are made, it is important that good communication occurs between the clinician and the pathologist both before the autopsy, ensuring that the pathologist is fully informed of the clinical problem, and after the autopsy, ensuring that the clinician is fully informed of the pathologist's findings and has an opportunity to discuss them with the pathologist. It is recognised that discussion of the autopsy findings is subject to consent of the Coroner – recent advice to Coroners, and case law, favour such discussion (see Section 5, Audit: the autopsy in clinical practice).

4.4.4 Where the pathologist is aware of circumstances about the death that raise the possibility that an interested party in the death might wish to be present, the pathologist should not perform the autopsy without the assurance from the Coroner that the parties have been given the opportunity to be represented at the autopsy and have declined.

4.5 Facilities available for performing Coronial autopsies, including ancillary investigations

4.5.1 It is recognised that antiquated mortuaries which do not meet modern design and safety standards make it difficult for safe and high quality autopsies to be performed.

4.5.2 Coroners' autopsies should not be carried out where appropriate facilities are not available.

4.5.3 All autopsies should be performed in modern, well-designed facilities meeting current health and safety standards.

4.5.4 Mortuaries must be adequately equipped with basic facilities for measurement, dissection and weighing. Additional appropriate equipment must be available for some specialised autopsies.

4.5.5 Facilities should be available for taking and storing specimens for microbiology, toxicology and chemistry, as well as histology samples.

4.5.6 CPA (UK) Ltd should continue to develop standardised criteria for mortuary accreditation, including public mortuaries.

4.5.7 Coroners are encouraged to use accredited mortuaries. Pathologists must bring to the attention of the Coroner any defect in mortuary premises which prevents safe performance of a high quality autopsy.

4.6 The standard of Coronial autopsy performance and reports

4.6.1 The standard of the autopsy should be the same as if it were a consented autopsy, in that it must satisfactorily address the clinicopathological problem presented by the death. Necessarily, the level of detail will differ between a straightforward, sudden death from heart disease and a death following complex medical and surgical procedures with intensive care effects.

4.6.2 Limitations may be placed by the authorising Coroner in terms of the extent of organ examination, e.g. some religious groups wish the minimum disturbance of the body, subject to obtaining an accurate cause of death. These must be observed, but if more extensive examination is deemed necessary by the pathologist, he or she should inform the Coroner of such and recommend further process. If the pathologist feels that those limitations will not permit proper pathological investigation, he or she should decline the request to perform the autopsy.

4.6.3 The depth of analysis, including the use of histology (see Section 9, Autopsy histology), needs to be agreed formally between the Coroner and pathologist. The degree of reliance upon gross findings only to determine the cause of death must be appropriate to the case. Where the cause of death cannot be given without full histopathological sampling, this must be done after informing the Coroner and, through him or her, the relatives. If organs need to be retained for diagnosis, this will be agreed with the Coroner, who informs the next of kin. If additional organ retention for teaching or research is desired, the next of kin needs to be consulted for consent, the Coroner also consenting whilst he or she is in possession of the body. Subsequent disposal of organs needs to be agreed with the next of kin and the Coroner (see The Royal College of Pathologists' guidelines on organ retention).

4.6.4 Coroners' autopsies should be reported to the same high standards recommended in the College's existing guidelines, and those now described in these Guidelines (see Section 8, Autopsy examinations and reports). The provision of a quality service to the Coroner includes audit of that service.

4.6.5 The present short *pro forma* used by many Coroners is too restrictive if it is rigidly adhered to but, with current information technology (IT) and word processing, it is capable of expansion to give a more satisfactory report consistent with the College recommendations.

4.7 The distribution of Coronial autopsy reports

The pathologist's report to the Coroner is the property of the Coroner but, as best practice, should be received by the consultant responsible for hospital care, the patient's general practitioner and other doctors and parties with a legitimate interest – i.e. fulfilling clinical governance requirements. Ideally, the information should be fed back to the next of kin. There may be particular reasons, such as an inquest or possible criminal proceedings, why a

particular report should be kept confidential, but such cases should be the exceptions rather than the rule. These practices need to be agreed with the Coroner beforehand.

4.8 Unsatisfactory Coronial autopsies

There is widespread dissatisfaction with the present medico-legal system and its operation under the existing Coroners Act and Coroners Rules. In particular, the increasing prominence of clinical governance in hospital practice runs contrary to many of the practices demanded by Coroners. Some of the practical factors that lead to less than satisfactory autopsies include the following points.

4.8.1 Lack of adequate information before autopsy. The Coroner has no power to order the production of medical records for the pathologist but, in practice, when a medico-legal autopsy is performed in the hospital of the patient, the records are available. Hospital IT networks include increasing ranges and types of medical record databases. Access to these can be important in providing information that was not available to the Coroner's officers authorising autopsies.

4.8.2 Formal arrangements between Coroners and Trusts concerning medical records should be made. Practices such as the removal of bodies from hospital to public mortuaries without the accompanying clinical notes may lead to pathologists being inadequately informed of important information. Similarly, deaths in the community may be followed by autopsies where relevant information (from general practitioners and hospitals) has not reached the pathologist. Minimum information sources available to the pathologist must include the name and contact number of the relevant hospital doctor (consultant and junior), the general practitioner if known, and of the next of kin if known. Pathologists should consider contacting the next of kin, via the Coroner's officer, to ascertain important facts if queries arise at the time of autopsy.

4.8.3 There should be a minimum dataset of information presented for deaths in the community, in addition to the usual identifiers and place of death. These include:

- the precise circumstances of the death
- the medical history and prescribed medications
- recent hospital admissions with details of location and lead clinician
- known or suspected use of alcohol or other recreational drugs
- occupation
- phone number of the patient's general practitioner.

4.8.4 Performing too many autopsies within a time period available, resulting in insufficient attention to problematic cases. These include hospital cases such as post-operative and intensive care deaths, where careful inspection of records, dialogue with clinicians, post-mortem histology and the results of pre-mortem investigations and biopsies may all be relevant. These Guidelines cannot specify the proper number of cases per working session, because it depends so much on case mix and on the degree of assistance available from APTs and from trainees (if available). However, review of data on workloads is increasingly part of regular appraisals of medical staff, and autopsy reports are used for internal audits. Heads of services and departments, and consultant colleagues, will be making judgements on whether individual pathologists are performing autopsies in such a manner that the resulting information is unsatisfactory.

4.8.5 Lack of audit. Where pathologists' reports are unlikely to come under a peer review, there may be a tendency for standards to fall. Both Coroners and Health Service statistics need high quality, adequately audited autopsies.

4.8.6 Attitudes of pathologists, Coroners and Coroners' officers. Pressure to provide a rapid and plausible natural cause of death may lead to inadequate investigation of cases which may be more complex than appears at first sight. The greater time and expense involved in the proper investigation of such cases, particularly with histology, may not be of value to the Coroners but is needed by the Health Service, the public interest and, importantly, bereaved

families. Clinicians and other interested parties who receive inadequate reports from autopsy examination lose faith in its value. Such deficiencies have been commented on in reports from The National Confidential Enquiry into Perioperative Deaths (NCEPOD), Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI), the Confidential Enquiries into Maternal Deaths and the National Sentinel Clinical Audit on Epilepsy-related Death.

4.8.7 Freelance pathologists working independently without attachment to NHS or university departments are working for Coroners in some areas. This is acceptable if the processes of continuing professional development (CPD) and regular appraisal are in place and the mortuary facilities are subject to CPA (UK) Ltd inspection.

5 AUDIT: THE AUTOPSY IN CLINICAL PRACTICE

5.1 The introduction nationally of clinical governance potentially boosts the significant role for the autopsy in hospital and general practice. However, much has changed in the decade since the 1991 joint working party report on the autopsy and audit. The proposed sampling at autopsy of 10% of general hospital deaths where there was no specific clinical demand, for example, is now inconceivable; apart from the continued decline in numbers of consented autopsies, the Human Rights Act 1998 would prevent such action.

5.2 One area of autopsy practice of great significance for hospitals is perioperative death. Only 31% of perioperative deaths reported to NCEPOD in 1999/2000 had an autopsy, and 84% of those were medico-legal. Major discrepancy from the pre-mortem clinical diagnosis was found in 23% of cases. Histology was done in less than one third of cases, probably because of actual or perceived restrictions under Coroners Rule 9 (on the retention of tissue). Absent or uninformative clinical history was a feature of one fifth of the autopsy reports, and less than half the reports included an adequate clinicopathological correlation. The recommendations within the latest NCEPOD publication (2001) to improve the quality and usefulness of perioperative death autopsies are congruent with the Guidelines presented here.

5.3 Another area of concern is maternal death. The latest confidential enquiry (2001) documents an unacceptable number of autopsy reports as 'deficient' or 'appalling' in quality, particularly in London. The most likely reason adduced is that such autopsies are often performed as medico-legal cases, in public mortuaries, by pathologists without experience or interest in maternal death, without liaison with clinicians and with the main intention of excluding forensic causes of death. Again, many autopsy reports from epilepsy-related deaths have been described as inadequate by the National Sentinel Clinical Audit.

5.4 The Royal College of Pathologists affirms that the autopsy provides valuable audit insights into the nature and clinical management of disease, which clinical colleagues, hospitals, general practices and other health institutions should seek whenever possible. Consistent performance and documentation of a high quality autopsy are pre-requisites for quality clinical governance pertaining to mortality.

5.5 Recommendations

5.5.1 Autopsy request forms must provide an adequate clinical summary, identify specific clinical problems, identify known or suspected infection risks and provide a telephone number of a clinician who knows the case. Where there is not clarity, prior discussion between clinician and pathologist will elicit the clinical questions being addressed and enable appropriate informed consent to be sought from relatives.

5.5.2 Autopsy request forms should be accompanied by the case notes, and by the diagnostic images where possible.

5.5.3 All autopsies should be carried out with thoroughness appropriate to the case and the clinical questions raised, and reported to a similar standard, be they hospital consent or required by law, done in a hospital mortuary (ideally CPA-accredited) or a public mortuary. The pathologist should have the appropriate specialist expertise or, at least, the ability to document and preserve the information that a specialist would require to give an opinion on the case.

5.5.4 All autopsies required by law, whether in hospital mortuaries or public mortuaries, should be performed in a manner which allows reports to be written at least to the minimum standards set down in these Guidelines.

5.5.5 Coronial autopsies on patients who die in hospital should, if possible, be performed in the hospital mortuary to enable closer communication with clinicians (see Section 4.4, Where Coroners' autopsies are performed).

5.5.6 Discussions with the Coroner on the issues of clinical governance are required. Current advice to Coroners, legislation and case law favour advance disclosure of autopsy findings to interested parties. Coroners should be encouraged to agree to the use of their autopsy reports in clinical audits.

5.5.7 All autopsies should be performed by consultants or trainees under consultant supervision. Trainees with insufficient autopsy experience must not be left unsupported to perform difficult cases.

5.5.8 One or more members of the clinical team should attend the autopsy or at least a demonstration of the major findings. If clinical work prevents this, a telephone conversation should be held the same day to discuss the results.

5.5.9 If the case involves a perioperative or peri-intervention death, it is often advantageous to have the operator (surgeon, interventional radiologist, cardiologist, etc.) assist in the autopsy dissection. Clarification and documentation of the often complex procedures and morbid anatomical results is more important than any potential conflict of interest if an adverse clinical event is thereby recognised.

5.5.10 If evidence of an adverse clinical event is identified during the autopsy (e.g. intravenous lines misplaced and causing significant haemorrhage, a perforated viscus) and is considered to be a significant factor in the death, the relevant clinician (if not already present) should be invited to come to the post-mortem room to witness and discuss the findings. Description and imaging should be accurate and complete. In such an event, the Coroner or Procurator Fiscal should be informed if the investigation of death is not already under that jurisdiction.

5.5.11 Means of recording autopsy gross and microscopic images – by digital camera, video and transparency film – should be encouraged for greater dissemination of clinical information, subject to appropriate consent (see Section 3.11, Photography).

5.5.12 An interim report of the gross findings and provisional conclusions or, if possible, the final report should be sent to the consultant in charge within five working days. In Coronial cases, the permission of the Coroner to disseminate such reports to clinicians must be established.

5.5.13 Diagnostic or confirmatory histopathology should be done in all cases, subject to the requirements of the Human Tissue Act 1961 and the instructions of the Coroner (see Section 9, Autopsy histology).

5.5.14 The final complete report requires a minimum set of information (see Section 8, Autopsy examinations and reports). It should be issued within one week of the date when the results of all further investigations have been received. A record must be kept of all the parties to whom the report is sent; in Coronial cases, such distribution must have the agreement of the Coroner.

5.5.15 In time, the autopsy report should be part of the hospital pathology IT record, available for inspection on hospital IT monitors by the same medical constituency permitted to view

surgical biopsy reports. It should incorporate SNOMED or similar coding of diagnoses if the hospital system is appropriately set up. The relevant Coroners must be consulted on IT archiving of autopsy reports and agree to the process.

5.5.16 There should be regular mortality meetings within clinical directorates that include the active participation of pathologists where autopsies have been performed. These meetings, and the cases discussed, should be minuted and the records retained for audit checks. The medical directors of hospitals should encourage mortality meetings through clinical governance. Discrepancies between clinical and autopsy diagnoses should be discussed openly at such meetings.

6 HEALTH AND SAFETY – INFECTIONS

6.1 Infection risks are common in the mortuary and autopsy suite. Health care workers rightly expect protection from hazardous infections in their working practice, but complete elimination of the risk of acquiring a significant infection at work is not possible. The aim is to reduce the risk as far as feasible within the resources available whilst maintaining a service to patients, clinicians and medical institutions. If a significant infection risk is encountered, there are protocols for prophylaxis, treatment and counselling available. The emphasis here is on risk assessment, establishment of protocols for dealing with all anticipated circumstances, and raising the level of universal precautions. The forthcoming revised document from the Health Services Advisory Committee (HSAC), *Safe working and the prevention of infection in the mortuary and post-mortem room*, has been consulted in draft form for these Guidelines.

6.2 The issues addressed in these Guidelines include:

- the classification and stratification of the hazardous infections that may be encountered
- the development of standard protocols to minimise the risk of infection from all cadavers
- the assessment of risk on a case-by-case basis, including the issue of pre-autopsy testing for infections
- the development of protocols to deal with the more commonly encountered hazardous infections, and with rare but dangerous infections
- the unresolved question of whether pathologists in all properly resourced mortuaries – hospital and public – should perform infectious autopsies (particularly Hazard Group 3) or whether specialist centres should be established regionally to deal with them.

6.3 There are other, non-infectious, risks to health care workers in the mortuary. These include electrical safety, radiological hazards, manual handing and chemical substances hazardous to health. These are regulated in standard hospital and national protocols (e.g. COSHH), and are not considered in these guidelines.

6.4 Acquisition of infection

Infections in the mortuary can be acquired by these five routes:

- percutaneous inoculation
- inhalation
- ingestion
- skin contamination without inoculation
- contamination of mucosal surfaces (eye, mouth, nose).

The main practical concerns are blood-borne viruses and inhaled virulent pathogens such as M. tuberculosis.

6.5 Classification of pathogens

The Advisory Committee on Dangerous Pathogens (ACDP) categorised infectious agents into four Hazard Group (HG) categories, according to:

- their virulence as infections
- their transmissibility and ability to cause epidemics
- their preventability (e.g. by vaccine or prophylactic chemotherapy)
- their treatability.

For mortuary workers, the significant groups are HG#3 and 4, and the interpretation of pathologists' and APTs' responsibilities, accountabilities and protocols for safe practice have caused many problems for hospitals, mortuaries, staff and Coroners. HG#2 infections are more common in clinical practice and have also raised concerns in autopsy practice.

6.6 Hazard Group 2 infections

6.6.1 The agents include antibiotic-resistant organisms such as methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), food poisoning, Salmonella spp and other enteric pathogens, and Leptospira spp. The most likely route of transmission of these biological agents in the post-mortem room is by hand to mouth. Good hygiene procedures, including proper hand washing, should prevent their transmission. Inoculation of staphylococci, meningococci and streptococci is also possible, but reduced to a minimum by standard modern universal precautions.

6.6.2 Regarding autopsies on patients with meningococcal infection, with the low risk of inhaled infection during the procedure, advice from occupational health (OH) units and departments of infection is against vaccination of mortuary staff and pathologists. Wearing a mask appropriate for a tuberculosis autopsy provides sufficient protection and additional antibiotic prophylaxis can be considered on a case-by-case basis.

6.7 Hazard Group 3 infections

6.7.1 These are caused by 'biological agents that can cause severe human disease and presents a serious hazard to employees; it may present a risk of spreading to the community, but there is usually effective prophylaxis or treatment available'.

6.7.2 The HG#3 agents that may be encountered in the post-mortem room in the UK are listed in Appendix 1, Hazard Group 3 pathogens. Many are only imported and are extremely infrequent in practice, but they need to be categorised so that appropriate action may be taken in the event of an autopsy being required. The most frequent are tuberculosis (TB), human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV).

6.8 Hazard Group 4 infections

These are caused by 'biological agents that cause severe human disease and is a serious hazard to employees; it is likely to spread to the community and there is usually no effective prophylaxis or treatment available.' This group includes the viral haemorrhagic fevers (VHF), for which there are no current vaccines: Marburg, Ebola, Lassa fever, Congo-Crimea haemorrhagic fever. Other agents in this category are smallpox (only kept in restricted laboratories, with no wild infection since the late 1970s) and Nipah virus infection (not yet formally classified in HG). VHF infections are not endemic in the UK. Such cases are (for the moment) rarely imported into the UK, with less than one case recognised per annum on average.

6.9 Pre-autopsy screening of cadaveric blood for Hazard Group 3 pathogens

6.9.1 HBV, HCV and HIV – the major blood-borne HG#3 pathogens of concern – can be determined with accuracy in post-mortem blood samples. This contentious issue is clouded with the issues of permission to test and appropriate safety practices in the mortuary.

6.9.2 In many centres, there has been regular testing of apparent high-risk cadavers for the blood-borne viruses HBV, HCV and HIV. This particularly pertains in the Coronial system where certain persons are regarded as 'high risk' through behavioural and ethnic characteristics. However, these infections also occur in non-'high risk' groups, rendering any scheme that does not test nearly every cadaver imperfect in detecting potentially hazardous infection. HBV vaccination is now universal for all mortuary staff in both hospital and public mortuaries, and finding serological evidence of HBV infection in a cadaver is no reason to refuse to perform an autopsy.

6.9.3 Where the role of the autopsy is to determine the causes of death, any appropriate tests for infection may be performed where that infection relates to the cause of death. If HIV and HCV infection are part of the cause of death sequence, no consent from anyone is required. If the autopsy is required by law, the Coroner or Procurator Fiscal should be consulted, since this is an additional test and there may be funding issues. For example, if a patient dies of pneumonia or a cerebral lesion and underlying HIV is a serious possibility on clinical and demographic grounds, the pathologist can test blood for HIV infection without specific permission from next of kin; the only absolute contra-indication to such testing would be if the patient had, during life, expressed a wish not to be so tested and the autopsy is a consented one. If a patient dies of cirrhosis, then HBV and HCV tests are appropriate if they have not already been performed.

6.9.4 The GMC guidelines in *Serious communicable diseases* are clear, as are those in the HSAC's *Safe working* draft guidelines. Both are congruent with the following recommendations.

- A pathologist may test for any infection that appears relevant to the cause of death, using post-mortem samples, in medico-legal cases. In consented autopsies, the next of kin should be informed of the process and the result.
- If a health care worker is injured during an autopsy, the deceased may be tested for suspected infection – when there is 'good reason' to suspect that infection.
- There is no justification for blanket pre-autopsy testing of cadavers for a range of serious communicable diseases (SCD) as a protection for staff under the (spurious) justification of seeking diagnostic information before the autopsy. If the autopsy reveals evidence that leads to suspicion of a SCD, then testing takes place. If there is no such evidence, and the presence or absence of a possible SCD in apparently 'higher risk' patients does not affect or inform on the pathological cause of death, then there is no strict justification for testing. It is implicit in this guidance that reasonable universal precautions are used for autopsies.
- Where the diagnosed SCD is part of the chain of events in the cause of death, whether under Parts I or II of the standard death certificate, this information must be presented and recorded. The public health information outweighs the private concerns of relatives. This particularly applies to patients with HIV/AIDS, when relatives often wish the information not to appear on the death certificate.
- Next of kin who may be at risk from a SCD should be informed of a positive diagnosis of SCD in a cadaver if it is discovered at or after autopsy. For practical purposes, the pathologist informs the Coroner, the clinician who requested the autopsy or the consultant in communicable disease control (CCDC) of the presence of a previously unsuspected or unconfirmed SCD (see Appendix 4, Notification of infectious diseases). It is up to the Coroner, clinician or CCDC to provide this information to the relevant next of kin, perhaps via the general practitioner or appropriate contact tracing unit.

6.10 Pre-autopsy assessment of Hazard Group 4 (VHF) risk in a cadaver

The ACDP's publication on management of VHF and the HSAC's *Safe working* document specifically state that autopsies on such cases are not to be done in the UK because of the risk of infection, the relatively high mortality and the lack of totally effective chemotherapy. If an autopsy is deemed necessary for clinical or medico-legal reasons, it should be referred to a specialist centre, where appropriate protocols have been developed. But there needs to be a procedure for dealing with suspected cases of fatal VHF, which happen several times a year in the UK, and where the diagnosis has not been established nor excluded prior to death. In these cases, the Coroner will be informed since the cause of death is unknown. It is important to confirm or exclude VHF quickly. Recommendations are given in Appendix 2, Guidelines for assessing presence of Hazard Group 4 pathogens in a cadaver.

6.11 Standard procedures for all autopsies and for Hazard Group 3 cases

6.11.1 The last 20 years have seen an upward trend in the application of safety and hygiene precautions during all autopsy procedures. Whilst a proportion of cadavers with a SCD will be known prior to autopsy, not all will and there are now effective and cheap universal precautions that will protect against inadvertent infection to a high level. There is no epidemiological evidence base from the mortuary to prove the point (incidents being uncommon), but cut-resistant gloves should protect against blood-borne virus infection and fine-filter masks should protect against the risk of tuberculosis. Where appropriate facilities for performing high-risk autopsies are available, a refusal to perform an autopsy purely because of perceived risk of exposure to a SCD would have to be justified.

6.11.2 Pathologists and APTs should wear the following for all adult autopsies:

- surgical scrub suit
- waterproof or water-resistant disposable gown (e.g. Tyvek) that completely covers the arms, chest and legs
- plastic disposable apron to cover chest, trunk and legs
- eye protection or plain unventilated visor
- face mask to protect the mouth and nose from direct splash contamination, if visor is not worn
- disposable paper hat (optional)
- gloves: outer latex over neoprene cut-resistant gloves
- rubber boots with reinforced toe-caps.

6.11.3 Apart from hand and respiration protection, for which there are higher levels of protection (see Appendix 3, Protocols), these standards reduce to an acceptable level the risk of infection from cadavers with HG#3 infections, even when they are not known prior to the autopsy.

6.11.4 It is recommended that:

- mortuaries draw up protocols for dealing with infectious cadavers, along the practical lines indicated in the protocols in Appendix 3, Protocols. The pathologist has a duty, under health and safety legislation, to minimise risk to those who may be involved in handling a cadaver during and after autopsy. All staff working in the post-mortem room during the examination of a high-risk case need adequate training in mortuary techniques and safety procedures for such cases
- in a well-equipped mortuary with adequate ventilation, where the recommendations in this document are followed, the risk of infection from HG#3 cases is so low that refusal to perform an autopsy on the grounds of 'risk of infection' is illogical, if not unethical. However, if the pathologist considers him or herself insufficiently experienced or practised in specific infectious cases to derive the necessary clinicopathological conclusions, there is a strong case for referring the autopsy to a centre with the appropriate experience

- a separate high-risk infection suite is ideal but not essential for performing high-risk autopsies
- a circulator (a third person working alongside the pathologist and APT, remote to the actual procedures at the autopsy table and who assists with communication, arranging specimen removal, providing clean instruments and photography) is ideal (best practice) but not essential for high-risk cases
- trainee pathologists should gain experience of these cases and assist when they are deemed technically competent and safe in handling infected tissues and instruments. Whilst the HSAC's *Safe working* draft document states that the number of people involved in high-risk autopsies should be limited to three, flexibility is necessary for training purposes; this also applies to training anatomical pathological technicians
- pathologists decide themselves on whether to follow the *Safe working* document in cases of Creutzfeldt-Jakob disease in enclosing the entire head within a large plastic bag during use of a bone saw (see Appendix 3.4, Creutzfeldt-Jakob disease)
- appropriate vaccination schedules be given to pathologists and APTs:
  - the following vaccinations to be routine, with logbooks held in the occupational health unit documenting the completion of the appropriate schedules and antibody titres where appropriate: hepatitis A and B, BCG, poliomyelitis, diphtheria and tetanus
  - meningococcal vaccination; not recommended, see paragraph 6.6.2
  - in centres where there are many patients coming from resource-poor countries overseas (e.g. London, near international airports), we also recommend vaccination against yellow fever and rabies.

6.12 The notification of infectious disease cases

Under the Public Health (Control of Disease) Act 1984 and the Public Health (Infectious Diseases) Regulations 1988, the doctor who suspects that a patient suffered from a notifiable disease has a responsibility to report the case to the local consultant in communicable disease control (CCDC). This applies to the pathologist who makes the previously unsuspected diagnosis. Report forms are available from the CCDC and the hospital's department of infection/microbiology will assist the pathologist in this task. The current list of notifiable diseases is given in Appendix 4, Notification of infectious diseases.

7 AUTOPSY EXAMINATION OVERVIEW

7.1 These Guidelines are not the place for a detailed description of the actual autopsy process and physical technique. Many illustrated journal and book texts are available. However, a brief summary is appropriate as a guideline towards good practice.

7.2 Patient notes and consent forms must be inspected carefully, particularly in relation to clinical questions that the autopsy must address and possible limitations placed on the examination by relatives.

7.3 The identity of the cadaver must be confirmed, by inspection of patient label bands on the arm/leg, before commencing any dissection.

7.4 Intravenous (IV) lines and devices

If the patient has died with tubes, IV lines, cannulae, etc. inserted, the cadaver should come to the mortuary for autopsy with all these medical devices *in situ*. Nursing staff may wish to remove them prior to transfer, but hospital clinical governance guidelines must make clear those circumstances where such medical devices must not be removed, and specify

permissible means of facilitating viewing and preventing dislodgement or leakage, to minimise risks to health and safety.

7.5 Dissection

7.5.1 The pathologist should not commence the examination prior to the provision of a full clinical history, or of details regarding the circumstances of a death in the community. Where an inadequate history is provided by the Coroner, the pathologist should explain what further information is required and decline to perform the autopsy until it is available.

7.5.2 After identification and external examination by the pathologist, the body is opened by the pathologist or APT. The standard 'Y' incision with *in situ* dissection of the neck structures is recommended as best practice for basic examination of both sexes; but the vertical line incision of the lower neck is acceptable for cases where detailed examination of the neck structures is not critical. The internal organs may be removed individually, together in a single block or in four main blocks (thoracic, intestines, other abdominal and pelvic). Organs often overlooked at autopsy include testes, breast and intestines. Unless the examination requires alternative approaches to demonstrate specific pathological processes, the pelvic floor should be left intact. The internal female genitalia should be removed with a short cuff of vagina and rectum. Sites of complex recent surgery are best examined with the appropriate clinician present.

7.5.3 The precise order in which individual organs and systems are dissected is not important, but the method of dissection must be governed by the need to demonstrate and document accurately and completely the pathological conditions that are relevant in the specific clinical circumstances. This may require modification of normal dissection routines and delay the final dissection until the demonstration of autopsy findings. All major organs (heart, lungs, brain, liver and kidneys) should be dissected in order to facilitate examination of the blood and lymphatic drainage in addition to relations with adjacent structures. These organs should be separated and weighed. If permitted and clinically relevant, fixation of the intact brain, followed by a detailed examination by a neuropathologist, produces a higher detection rate of abnormalities.

7.5.4 Pathologists should have a full repertoire of special dissection techniques to enable examination of unusual sites. Examples include:

- spinal cord
- vertebral arteries
- temporal bone
- sino-nasal block
- orbital contents
- cervical spine
- cardiac conducting system
- peripheral nerves
- long bones and joints.

7.5.5 Specific consent must be obtained for any potentially disfiguring procedure in a hospital consent autopsy; in a medico-legal autopsy, such procedures should not be performed without explanation to relatives and should be made after opportunities for viewing have been taken.

7.5.6 Awareness of how to obtain appropriate samples for biochemical, microbiological and toxicological analyses is important. Specific appendices are being developed to cover common scenarios, but general guidance is available in the literature.

7.5.7 Aspects of practical autopsy performance relevant to fetal and perinatal deaths, maternal deaths, sickle cells deaths and neuropathological cases are indicated in other sections and appendices of these Guidelines.

7.6 Completeness of the autopsy

7.6.1 There is a body of opinion among pathologists that favours voluntary limitation of the procedure when a grossly obvious and apparently satisfactory cause of death is found during evisceration and dissection. The prime example is not to examine the skull and brain if an incontrovertible cause of death is identified elsewhere. Consented and Coronial autopsies are both affected, the intention being to reduce unnecessary incisions and reduce concern among the next of kin.

7.6.2 As best practice, the College stands firmly for as full examination as possible within the agreed consent and Coronial authorisation. Where an autopsy is considered necessary after proper investigation of the circumstances of the death, that autopsy should be a high quality examination, which addresses all the questions that may be raised by the death. Routine brain examination is discussed further in Appendix 5, Minimum datasets and best practice for examinations and reports on internal organs.

7.7 Reconstruction of the body

The reconstruction of the body should be of a high standard so that it will not leak and can be viewed after autopsy without distressing the next of kin. The body must not be used for the disposal of clinical waste; it must contain only material from the body and material required for its reconstruction. The pathologist is ultimately responsible for the quality of the reconstruction, and should ensure that the APTs who, in most cases, perform the task are adequately skilled.

8 AUTOPSY EXAMINATIONS AND REPORTS: MINIMUM STANDARDS AND DATASETS

8.1 In 1993, The Royal College of Pathologists published *Guidelines for post mortem reports*. These new Guidelines replace the 1993 edition and also incorporate guidelines that have emerged in the last five years from the College of American Pathologists.

8.2 The autopsy report clearly should inform the clinician, Coroner, general practitioner and pathologist. The format must be flexible and widely comprehensible. The extensive use of IT means that, within an institution, reports may be standardised, with minimum data entry sections. They must also be typewritten or printed, not handwritten.

8.3 A single standard should be applicable to all autopsy examinations, whether funded by the National Health Service, Coroner or Procurator Fiscal. One current difference between these types is in the frequency of histological examination (see Section 9, Autopsy histology). All autopsy reports should achieve a basic minimum dataset. Whatever the level of complexity of the case, the report must address and, if possible, answer the clinical questions posed.

8.4 An autopsy report will normally include:

- demographic details
- clinical history and how it was obtained
- how consent to autopsy was obtained, and any limitations to the examination
- indication of attendance of clinicians at the autopsy
- external examination
- internal examination
- histology report – if histology was taken

- other analytical results (toxicology, microbiology, etc.), including significant negative results
- summary list of pathological findings and a clinicopathological commentary
- cause of death, using the Office of National Statistics (ONS) format.

8.5 General comments

It is envisaged that these Guidelines should serve for all hospital, Coroner and Procurator Fiscal autopsies, other than Home Office cases. The report should be typewritten on a form of adequate size. Pre-printed, single-page forms impose excessive brevity.

8.6 Timing of autopsy reports

8.6.1 A provisional report, to include at least a preliminary cause of death (where possible), a summary of the major findings and details of what has been retained and what further investigations are necessary, should be sent out within five working days of the autopsy. Any conclusions and cause of death at this stage are tentative and may be modified. The histological findings, the result of toxicology and microbiology (where indicated) with the commentary/conclusions and cause of death should be sent out as soon as possible, within one week of the availability of the outstanding investigations.

8.6.2 However, best practice is that (at least in adult cases) autopsy histology should be treated similarly to surgical biopsy histology and prepared promptly; then, when other investigations are not required or are not the rate-limiting step, the complete report is sent out within one week of the autopsy.

8.6.3 In perinatal deaths, more time may be needed and the usual interval between the autopsy and the meeting to convey the information from the autopsy to the parents is six weeks.

8.6.4 The final document should contain all the material issued initially, since experience shows that isolated supplementary reports are easily lost. A copy of the signed consent form (for hospital autopsies) should be kept by the pathologist with the final report in the department archive.

8.7 The autopsy report

The following must be written in the autopsy report; optional items are listed separately.

8.7.1 Demographic details:

- autopsy sequential number
- surname and forename
- hospital or A&E department number
- name of general practitioner and/or hospital consultant
- sex, age and date of birth
- date of death
- date of the autopsy
- next of kin or person giving permission for autopsy
- type of autopsy: Coronial or consented
- which Coronial jurisdiction
- name of the pathologist responsible for the autopsy
- place of the autopsy, unless provided by a header on the printed report
- persons present during the autopsy
- details of those persons to whom the report is to be sent:
  - Coroner or Procurator Fiscal
  - general practitioner
  - hospital consultant (including A&E department head)
  - other relevant hospital staff (e.g. intensive therapy unit staff, anaesthetist)
- date of the initial report and (if appropriate) date of the final report.

8.7.2 Optional demographic details:

- home address of the patient
- mortuary registration number
- NHS number of the patient
- Coroners' case number
- means of identification, e.g. name tag, and the name of the person who made the identification.

8.7.3 Type of autopsy:

- complete
- limited (with exclusions indicated)
- specialised (see Section 10, Specialised autopsies).

8.7.4 Clinical history:

- all autopsy reports must include a clinical history to make clear the context of the autopsy. The history comprises a summary of present illness in chronological order, and the circumstances of death. The past history often explains the findings. It is the pathologist's responsibility to be satisfied that a reasonable account has been obtained, and mere reference to notes or letters is not an adequate substitute. Absence of, or difficulty in obtaining, clinical information should be recorded. The source of clinical information (medical records, Coroner's officer only, etc.) should be recorded. Pre-mortem clinical and laboratory investigations should be quoted where relevant, including significant negative results. The pathologist should make clear that the history is his or her understanding from whatever sources, and that confirmation or clarification should be sought from those responsible for the care of the patient (see Section 4.8, Unsatisfactory Coronial autopsies)
- many Coroners specifically do not want a history or detailed history incorporated into the main body of an autopsy report. This is not best practice, but it is acceptable for the received clinical history in Coronial cases to be archived with the report but not copied into it. A better, practical option is to place the clinical history, including information that the pathologist has discovered, at the end of the autopsy report with a page-break so that it is effectively detachable when reports are being distributed to other parties, e.g. relatives.

8.7.5 External description:

- external appearances – sex, age, weight (kg), height (cm); weight and height are essential for perinatal and paediatric autopsies and best practice for adult cases
- ethnicity – e.g. Caucasian, African, Afro-Caribbean, Indian subcontinent, Chinese, Japanese, South American Indian; if uncertain, describe the skin and hair
- measurements of significant surface features, scars, operation sites, bruises, etc. with a clear description of the site, including diagrams or photography if necessary. The presence or absence of injuries to the eyes, genitalia and anus should be recorded
- infant/neonatal/fetal deaths require additional measurements, studies of dysmorphism, placental studies and X-ray (see Appendices 6 and 7)
- (optional) radiology and photography before the autopsy should be considered. Note the need for consent for making and using images from which the patient may be identifiable (see Section 3.11, Photography).

8.7.6 Internal organs examination – minimum datasets:

- as best practice, the College stands firmly for as full an autopsy examination as possible within the agreed consent and Coronial authorisation for several reasons: the underlying significant clinical pathology may not be apparent until all organs have been removed and examined; if limitation becomes habitual, it leads to de-skilling and when examination of such organs does become critical, unfamiliarity may blunt

analytical discernment; where trainee pathologists are present, it reduces their opportunities to practise and learn

- as best practice, comment should be made on the items listed in Appendix 5, including whether or not they have been examined. In routine practice, it is acceptable to summarise rather than particularise, but essential to include clinically important negative findings (e.g. patent coronary arteries in patients with suspected cardiac cause of death)
- sites of recent operations and procedures must be fully explored and recorded; the state of anastomoses and suture lines must be recorded
- the routine examination of brains is considered in Appendix 5
- organ weights should be recorded. In all cases, record the weight of the heart, lungs, kidneys, spleen, liver, and brain. Where relevant, thyroid, parathyroid and adrenal glands are weighed.

8.8 Histology and other investigations

8.8.1 Indicate whether material has been taken for histology.

8.8.2 Indicate what other material has been saved, i.e. toxicology, microbiology, etc.

8.8.3 Record organs retained for further study or other purposes, with reference to the person giving consent, and a note of how ultimate disposal is to be effected.

8.8.4 Record tissues sent to any third party for further investigation, such as genetic analysis.

8.8.5 State if no material has been retained.

8.9 Summary of findings

This is a list of the significant pathological lesions present. It is desirable to code these for future retrieval, e.g. using the SNOMED coding system.

8.10 Clinicopathological correlation

8.10.1 This is probably the most important part of the autopsy report for the clinician and often the Coroner, and the section that is read first.

8.10.2 A clinicopathological commentary must be written in the light of all the information available; the length will be determined by the type and complexity of the case. If material has been referred to an outside specialist pathologist, summarise his or her observations in the commentary.

8.10.3 The major clinical problems must be correlated with the pathological findings and, where possible, a brief narrative given of the sequence of events that led to death. In Coronial cases, this may be provisional if the clinical history is not fully known to the pathologist (see Section 8.7.4, Clinical history).

8.10.4 New pathological lesions are indicated with explanation of how these illuminate the clinical observations. It should be made clear which findings are incidental to the death and of no clinical import.

8.10.5 Any inconsistencies in the findings or a still uncertain pathogenesis of the final events are presented and steps to be taken, such as further opinions, mortality and audit meetings, are indicated.

8.10.6 Discussion with the responsible clinicians will yield optimal clinicopathological correlation, but frank discrepancies or disagreements must be noted.

8.11 Cause of death

8.11.1 The cause of death, for adults and children over 28 days of age, must be given in the standard form required by the Office of National Statistics (ONS).

8.11.2 The underlying cause of death should be the lowest completed line in Part I, such that conditions placed above it are 'due to' that pathology. Part II includes pathology, unrelated to that in Part I, which contributed toward death, but should not be used as a basket for all the minor pathologies found at autopsy.

8.11.3 For stillbirths and live-born children dying within 28 days of birth, there is a different standardised format for the cause of death. The form of the statement is:

"a. Main diseases or conditions in fetus/infant
b. Other diseases or conditions in fetus/infant
c. Main maternal diseases or conditions affecting fetus/infant
d. Other maternal diseases or conditions affecting fetus/infant
e. Other relevant causes."

8.11.4 If the patient died following an operation and that procedure was directly or indirectly contributory to the death of the patient, the fact and type of the operation must be included in the cause of death (under Part I or II, according to relevance) and the date of the operation given (date/month/year).

8.11.5 If the autopsy is limited, it may not be possible to give an ONS cause of death, and this must be made clear in the report.

8.12 Communication

8.12.1 Failure of information to reach its intended recipient is a cause of misunderstanding between pathologists and those persons they serve.

8.12.2 The report must be presented and printed to a high standard.

8.12.3 The time taken for reports to be issued and delivered should be audited.

9 AUTOPSY HISTOLOGY

9.1 The importance of taking histology samples from autopsies is evident to pathologists as an adjunct to diagnosis. Training requirements in autopsy histopathology interpretation are predicated on learning from correlating clinical, gross and relevant histopathological features.

9.2 As best practice, sampling of all major organs for histology in all autopsies is recommended. This is not possible if the Coroner or person consenting to autopsy will not sanction this (see Section 3, Consent issues). There is wide variation in Coroners' approaches to histology: a few encourage routine tissue sampling for completeness of the record; others do not permit histology unless mandated by the need to open an inquest (Coroners Rules 1984, Sections 9 and 12; Coroners Act 1988, Section 20(4)); most sit somewhere in between. Discussion with Coroners is critical, emphasising the present and future significance of full investigation and documentation.

9.3 Certain conditions are even better recorded by gross photography than by histology, and this may become a preferred adjunct in those cases, subject to consent (see Section 3.11, Photography). Examples are ruptured abdominal aneurysm, cardiac tamponade and perforated viscus.

9.4 The taking of material that does not 'bear upon the cause of death' (e.g. for use in teaching, EQA and research) is not permitted in Coronial autopsies unless the next of kin has given consent. Initial approval has to be provided by the Coroner when still in possession of the body, and he or she may then instruct his officers to approach the next of kin, or allow the pathologist to approach the relatives directly; bereavement officers should also facilitate this process. Once the Coroner ceases to possess the body, the next of kin may be approached for tissue retention for any reasonable purpose.

9.5 Guidelines for consented hospital autopsies

9.5.1 In all consented autopsies where permission has been so granted by the next of kin, tissue samples should be taken from all major organs. This will confirm the macroscopic diagnosis, refine the cause of death and assist in clinical audit and the training of pathologists.

9.5.2 The extent to which such tissues may subsequently be used for anonymised research, EQA and other laboratory and educational purposes should have been clarified at the time of consent for autopsy, according to local circumstances. In principle, all cases should come into this category and the local research ethical committee (LREC) may need to be informed or consulted (see The Royal College of Pathologists' *Transitional guidelines* publication).

9.5.3 The degree of sampling will vary from case to case: for perinatal autopsies, it is standard practice to take samples from all the main organs on a protocol basis; for adult autopsies, the extent will be determined by the pathology and the degree of interest in the case.

9.5.4 If permission for histology has been granted that includes the possibility of future research applications in a known area (e.g. HIV disease), consideration should be given to standardisation of sampling so that a large and comparable tissue database can be built up.

9.6 Guidelines for autopsies required by law

9.6.1 It is essential to consult with the Coroner (or Procurator Fiscal) as to histology sampling and work within the agreed remits. This should be done on a general basis to cover most anticipated types of cases, with case-by-case discussion of unusual cases as they arise.

9.6.2 The Coroner will usually agree to taking histology samples when such is essential to make a diagnosis, where the distinction between natural and unnatural cause of death has yet to be made and an inquest may have to be opened. Where discussion of the case with the Coroner does not permit sampling which the pathologist feels necessary to give an accurate cause of death, the pathologist should make clear both that the cause of death may not be accurate and the reasons for that outcome. If in advance of the autopsy, discussion with a Coroner indicates to the pathologist that retention of material that may be relevant to the investigation will not be permitted, the pathologist should decline the request to perform the autopsy.

9.6.3 Sampling the pathological organs whose histology will support the main diagnosis or diagnoses in all Coronial autopsies enables review of the diagnosis if there is a subsequent challenge. This would apply to cases where the diagnosis is grossly evident and, in the view of the majority of pathologists, would not normally require histology samples to make or confirm the diagnosis. The Coroner may refuse permission to consider this sampling, but it constitutes best practice.

9.6.4 The College recommends taking histology samples in cases where the type of lesion is evident and there is a natural cause of death but sampling would provide a more accurate categorisation of the pathology (e.g. the histological type of lung cancer). Some Coroners believe this goes beyond the strict interpretation of the Coroners Rules and Act and sampling may not be permitted by the Coroner. However some Coroners do not object, provided that the relatives have been informed and they do not object.

9.6.5 Ideally, all tissue blocks and slides from all autopsies should be archived as part of a permanent medical record. Because of recent public concern over organ and tissue retention, some Coroners expect pathologists to dispose of, or return (where requested), slides and blocks made for histological diagnosis once the cause of death is established and the case 'closed', with or without an inquest. If the Coroner requires this, the pathologist should discuss the implications: archiving this material allows a later review of the case, should questions regarding diagnosis be raised by interested parties in the death, and audit of pathological services to the Coroner can be done.

10 SPECIALISED AUTOPSIES

10.1 Surgical and diagnostic histopathology is increasingly specialised, with more departments organising the work so that pathologists concentrate on a limited field, usually related to specific organs although also by technique (e.g. cytopathology). Most autopsies come under the category of general autopsy pathology and are deemed to be within the capability of adequately trained pathologists who are also able to assimilate and learn from new cases.

10.2 However, there are cases where a more specialised approach, such as pertains in diagnostic histopathology, may be more appropriate in the interest of obtaining a more accurate cause of death and advancing clinical governance. Some of these deaths are recognised to be the prerogative of specialist pathologists who have specific accreditation (e.g. Home Office forensic practitioner licence) or members of an EQA-linked group of specialists (e.g. perinatal and paediatric pathologists). These already include:

- fetal, perinatal and paediatric deaths; also, unexpected deaths in childhood require a pathologist with a special interest and training in paediatric pathology. Where child abuse may be involved, or death is in suspicious circumstances, a pathologist with a forensic training should perform the autopsy and this individual should have experience in paediatric autopsies. Ideally, a forensic and a paediatric pathologist perform the autopsy together to provide a combined report
- suspicious/homicide deaths; autopsies on deaths in suspicious circumstances should be carried out by pathologists accredited by the Home Office.

10.3 There is a case for the autopsy of patients who are considered to have died from the following categories of death to be directed to local or regional pathologists with a special interest in the area:

- maternal death;it is considered preferable that the regional College assessor in maternal mortality or a nominated experienced deputy should perform the autopsy
- perioperative complex cardiac surgery, especially paediatric cardiac malformations
- complex neurological diseases; certain cases require specialised neuropathological techniques and should be performed by a neuropathologist. This may include patients with known or suspected CJD, unusual progressive neurodegenerative or inherited neuromuscular disease, congenital malformations, and patients who have died following complex neurosurgical procedures. These cases may be referred to a regional neuropathology department for post-mortem examination, or a neuropathologist may be invited to the hospital in which death occurred to perform the examination.

10.4 The following categories do not necessarily need specialist activity, though reference may be made to specialists to assist in the interpretation of the gross and microscopic findings. Specialists in other fields such as toxicology, pharmacy, and microbiology are also often helpful in elucidating a case.

The categories are:

- industrial diseases (e.g. pneumoconiosis, asbestos-related death)
- HIV/AIDS and tropical infectious diseases, other HG#3 infection cases (e.g. tuberculosis); suspected HG#4 deaths (viral haemorrhagic fever) (see Section 6, Health and safety – infections)
- perioperative liver and other transplantation procedures
- head injury fatalities
- Alzheimer's and related dementing disorders
- suspected overdose with illicit drugs (drugs of abuse)
- death in epilepsy
- suicide
- deaths from accidents
- sickle cell deaths.

10.5 In all these cases and circumstances, if the autopsy is required by law, the practices of the Coroner (or Procurator Fiscal) in the use of pathologists may be a constraining factor, it being more convenient to utilise the on-site pathologists rather than request one with more experience in a particular type of case. This indicates the need for discussion between pathologists and the Coroner concerning local practices.

10.6 The important point is that if an 'uncommon condition' autopsy is to be performed by a pathologist not familiar with that condition, the autopsy and its documentation must be detailed and accurate and the appropriate, properly preserved samples taken for analysis (histology, whole organs if appropriate and, for example, metabolic pathology/clinical biochemistry samples). The case can then be reviewed by a specialist. If, after discussion with the specialist, the pathologist feels that he or she is unable to perform and document the autopsy to the standard necessary, the pathologist should – if the autopsy has been requested by the Coroner – advise the Coroner that the autopsy is best performed by the specialist.

10.7 The College anticipates, and supports, the likelihood of increasing specialisation in autopsy pathology in order to improve the standard and usefulness of information gained from the autopsy in unusual and complex cases.

10.8 Fetal, perinatal, neonatal and infant deaths

Practice in this field has changed markedly over the last five years, partly in relation to the problems over organ retention. There are many older and recent guidelines on how to examine and report on fetuses and children. Guidelines are listed in Appendices 6 and 7.

10.9 Neuropathological cases

Guidelines for detailed examination of the central nervous system (CNS) in neuropathological cases are given in Appendix 8, Neuropathological cases. Also included are specific guidelines for the optimal examination of persons dying with epilepsy and advice on the formulation of the death certificate.

10.10 Maternal deaths

10.10.1 Deaths occurring during pregnancy or within 42 days of childbirth are classified as maternal deaths and should be notified to the UK Confidential Enquiries into Maternal Deaths. Those resulting from obstetric complications of pregnancy, labour and the puerperium are termed 'direct' maternal deaths, whereas those due to disease which pre-dated or occurred during pregnancy, but were aggravated by the pregnancy, are termed 'indirect'. 'Fortuitous' deaths are due to causes not related to or influenced by pregnancy. The Enquiry is also

interested in 'late' deaths, occurring up to one year following delivery, although at present these are not formally included in the statistics of maternal mortality.

10.10.2 Conduct of the autopsy

Maternal deaths are now so few that individual pathologists may have little personal experience of the problems involved: there are about 100 per annum in the UK. The proper conduct of a maternal autopsy calls as much for routine good pathological practice as for special expertise, but an awareness of certain common obstetric problems is essential. Pathologists should refer to the article and the Confidential Enquiries' reports cited in the Bibliography. The assistance of an obstetric pathologist, neuropathologist or other specialist should be requested whenever appropriate. Guidelines on the specific disorders found in maternal death are listed in Appendix 9, Maternal death.

10.11 Forensic pathology cases

Guidelines on forensic pathology practice have recently been published by The Royal College of Pathologists. These are presented in Appendix 10, Forensic examinations. The Home Office Policy Advisory Board for Forensic Pathology's practice guidelines, published in 1966, are under review.

10.12 Adult cardiac cases and perioperative deaths

Guidelines on autopsy following cardiac surgery in adults are expected from European initiatives in 2003.

10.13 Sickle cell disease deaths

Major pathology occurs in patients with the following three sickle cell phenotypes: HbSS, HbSC, HbS-β-thalassaemia. Less commonly, patients with sickle cell trait die as a result of their condition. Medico-legal experience indicates that pathologists have problems in evaluating sickle-related deaths. Guidelines are outlined in Appendix 11, Sickle cell disease.

11 ANATOMICAL PATHOLOGY TECHNICIANS

11.1 Guidelines were approved by The Royal College of Pathologists' Specialty Advisory Committee on Histopathology in 1995 and are here modified as recommendations concerning the role of Anatomical Pathology Technicians (APTs) in evisceration and dissection of cadavers. It is apparent that the degree of delegation of dissection of cadavers to APTs by pathologists varies considerably. Many APTs are highly skilled in dissection and their skills should be encouraged and used. But concern has been raised that excessive delegation, particularly dissection taking place before the pathologist arrives, destroys signs that should be observed by the pathologist and impairs the value of the autopsy. This has been the case in Coronial autopsies performed in public mortuaries.

11.2 APTs who assist at Coroners' and consented autopsies should hold the Certificate or the Diploma of the Royal Institute of Public Health (RIPH), or be in a recognised training post under the supervision of a qualified APT.

11.3 Under no circumstances should an APT commence opening the body before the pathologist has checked the identity, and examined the external surface, of the body nor until the pathologist is satisfied that there are no suspicious circumstances, that the death has not occurred in relation to recent surgery and that there are no allegations of suboptimal care.

11.4 Ideally, the pathologist should personally make the main skin incision and remove the organs (with the assistance of the APT) so that all the body cavity features and all abnormalities are seen and palpated. This particularly applies to post-operative deaths, suicides, accidents and perinatal deaths.

11.5 Because of pressure of work, this procedure will not be adopted everywhere. Delegation of evisceration to a skilled APT is acceptable. The profile of APTs is changing and they are encouraged to be more skilled. APTs may assist at or perform eviscerations, on the direction of the pathologist, after the latter has studied the history and made a full external examination. The pathologist should be immediately available should there be unexpected findings or unusual anatomical arrangements; when an APT encounters such findings, he or she must not continue until the pathologist has assessed the appearances.

11.6 The APT should not dissect individual organs from the tissue blocks as such procedures may result in the loss of important material, e.g. pulmonary thrombo-embolus, tumour embolus in renal vessels, anatomical relationships following gastro-intestinal surgery, etc.

11.7 The APT may reflect the scalp, saw through the calvarium and expose the dura. Only after prior consultation with the pathologist should the APT remove the brain.

11.8 The spinal cord may be removed by the APT in the presence of the pathologist. Other procedures, e.g. stripping the dura or removing samples of bone marrow from the spinal column, may also be carried out by the APT. These latter procedures may be carried out unsupervised once the pathologist is satisfied as to the competence of the APT, but the pathologist should be immediately available should any problems arise.

11.9 If there is a significant paediatric or perinatal autopsy workload within a mortuary, a specific APT (with RIPH Certificate qualification as a minimum) should have the responsibility for coordinating the paperwork, autopsy data, radiology (if required), histology samples and viewing by relatives. It is not appropriate for APTs to open the bodies of fetuses, infants or young children.

11.10 There must be full agreement between the responsible pathology consultant(s) and the APTs as to protocols for accepting, performing autopsies on and releasing cadavers with known or suspected HG#3 infections (see Section 6, Health and safety – infections). Ideally, the APT should be at RIPH Diplomate level of experience.

11.11 There is a fresh initiative to prepare for formal state registration and self-regulation of APTs, linked with the Institute of Biomedical Sciences (IBMS) and the RIPH.

12 AUDIT OF THE AUTOPSY

12.1 In any evaluation, the autopsy procedures should themselves be scrutinised. As the CESDI, NCEPOD and Confidential Enquiries into Maternal Deaths reports and personal experience iterate, there is a small proportion of autopsies performed and/or reported inadequately, so that clinical questions are not addressed or answered satisfactorily. Coroners also provide evidence that they are aware of deficiencies in autopsy performance, but may not feel qualified to address and remedy these deficiencies. Within hospital settings, inadequate autopsy practice becomes evident through mortality meetings (if they are held), but this can be a slow process.

12.2 Means to evaluate formally the quality of autopsies are being introduced into practice, with The Royal College of Pathologists' Professional Standards Unit leading in general pathology. Formal audit in forensic pathology has been in place for several years.

12.3 Indicators of autopsy performance include:

- the demographic data in the report
- the timeliness and distribution of reports
- the completeness of body and organ descriptions (minimum datasets), in the context of the request for the autopsy and the clinical questions posed
- histology – its use and relevance
- the quality of the clinicopathological correlation that summarises the autopsy report
- the adherence to consent including tissues and organ retention.

12.4 The means by which and by whom the autopsy may be evaluated include:

- self-assessment and review of past cases
- feedback from stakeholders: clinicians, Coroners, general practitioners and families
- mortality meeting audits
- internal peer review: paper report, slide and image reviews
- regional EQA schemes and peer review of reports, images and slides
- direct observation by peers
- the frequency and nature of complaints, via the hospital Quality Unit.

12.5 The College recommends that pathologists and departments should pursue such processes to open up the autopsy to proper audit. Regular autopsy EQA participation should become part of clinical governance standards, as occurs in paediatric practice. It can be included with the regional EQA schemes that operate for diagnostic histopathology.

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In future, Confidential Enquiries will be organised under the **National Institute of Clinical Excellence**
www.nice.org.uk