

Post Mortem Technique Handbook

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Post Mortem Technique Handbook

Foreword by Professor Sir Colin Berry

With 56 Figures



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DEDICATIONS

To mum, Mike and especially to Andrew. *DJH*

To Sue, Tim, Emma and mum, but particularly my father Peter, who sadly died during the preparation of this book. *MTS*

Foreword

The relentless decline in the hospital based autopsy has been documented elsewhere in detail and has been generally deplored as a loss of an important method of “quality control” at a time when the practise of Medicine is closely scrutinised. This is not the place to revisit these well-rehearsed arguments but the change itself provides a powerful justification for the production of this book.

The decrease in clinically requested autopsies in hospitals leaves a large and increasing number of Coronial autopsies to be done; many of these in circumstances of discontent with some aspect of the medical or other management of the events which ultimately lead to death. The pathologists now performing these autopsies will not have had the amount of experience that was commonplace among their predecessors; an experience of carrying out procedures which, although devised for different purposes, can provide a more complete examination of the whole body than often appears necessary in straightforward deaths in the community. In my first two years in Pathology I performed 200 autopsies; most of my contemporaries will have had a similar grounding – it would not be possible to provide this experience for staff in training now, except in some parts of the European mainland.

So there is a need to provide a written but practical account of the autopsy which will help those who may find themselves in unfamiliar territory. A “fixed” technique will not do for all cases (this is perhaps most evident in infancy and childhood) and a number of procedures are presented with this in mind. Readers will find tables of weights, dimensions and diagrams, which will help in description or illustration in reports and save searches of now unfamiliar anatomy texts. Although much has been written about the investigation of suspicious or unnatural death in recent years, it is difficult to find help with the more prosaic work and Ross’s “Post Mortem Appearances” is more than 30 years old. This text addresses questions which will present themselves to Pathologists in conventional hospital practice who have to provide clear accounts of processes and descriptions of findings for discussions with colleagues and relatives, hospital case conferences, Coroners courts or legal reports.

Professor Sir Colin Berry
August 2000

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Preface

Post mortems have been performed for thousands of years, but it was not until the eighteenth century that they became recognised as being fundamental to medical practise. Before this they were usually performed by the doctor who was attending the person during life and were used primarily for anatomical education. The period beginning with the 1700s saw the upsurge of pathology as a distinct speciality within medicine, with post mortems being carried out after most deaths. In addition to anatomical interest, the post mortem was by then also performed to identify and characterise all forms of disease and thereby help to develop treatments and identify misadventures of therapeutic measures. At this time the post mortem became the foundation of medical knowledge for both students and indeed postgraduate physicians. Observations were published for all to learn from. Over the next 200 years, great figures such as Morgagni, Rokitansky and Virchow developed pathology and post mortem examinations and established the scientific methodology of linking clinical and pathological findings. In this way numerous diseases and conditions were described and therapies devised.

This interest in the subject continued well into the first half of this century and the post mortem was still considered central to medical education and practise. During the past 30 years however the number of, and interest in, post mortems has declined markedly in many countries; from around 50% of hospital deaths in 1950 to less than 5% now. The reasons for this are various, not the least being the clinician's attitude to the procedure and economic constraints. The view has been taken that through the millions of post mortems performed to date, all known diseases have been described in detail and catalogued, with their causes and effects documented. In addition, the relatively recent explosion in investigative procedures has given the impression that all elements of a particular condition can be completely identified before death. These facts are felt to make the post mortem investigation superfluous. No longer does each post mortem reveal a startling new discovery.

This disinterest is misplaced for several reasons. Firstly, new diseases or complications of well-documented diseases are being described constantly. Another element is the importance of identifying intercurrent conditions that may well be relevant to the mode or cause of death. This is particularly important for epidemiological surveys. Post mortems can also give a unique insight into the causality of a disease and this can have important ramifications for prevention and treatment. In fact, documentation of the effects of treatment itself is an important reason for performing a post mortem. A vast amount of knowledge is still to be obtained from post mortems and it is obvious that with the decreasing number

being performed at the present time, this information may well be overlooked completely.

This disinterest does not apply to the other form of post mortem seen in pathological practise, the legal or coroner's post mortem. Nobody denies the importance of these procedures to identify a mode of death for forensic reasons or for the peace of mind of the relatives. In fact the relatives' concerns and fears are often not considered when hospital post mortems are not requested. It is frequently of considerable comfort to bereaved relatives to know exactly what has finally taken away their loved ones or to know that a rare (or previously unknown) complication of a particular disease or treatment, overlooked in their relative, might be recognised and dealt with appropriately in the next patient. All of these points show that the post-mortem is still an invaluable procedure in medical education and in establishing a cause of death.

It is obvious moreover that a reliable and thorough systematic method of post-mortem technique must be followed to obtain this detailed information and ensure that no element of any individual case is overlooked. It is especially important to learn such a method at an early stage of training so that it becomes second nature (not the least for examination purposes). Therefore this account hopes to give a thorough and repeatable technique for a novice to follow and in fact for more experienced prosectors to consider. It is intended that most methods usable are contained here, but it is up to the individual to decide which method suits them and which is the most appropriate to employ. The information is given in detailed descriptive text with dispersed diagrams to aid understanding. The techniques are presented in a general descriptive manner with many regularly used special methods indicated as the text proceeds. More specialised techniques that may be required less frequently will be described in the relevant systems chapter. A limited number of relevant references is given at the end of each chapter with a more extensive bibliography listed at the end for further reading.

Ideally every post mortem should follow a uniform and standardised method in order to obtain and compare findings between different centres, with international standards being met. Despite the fact that legal systems differ between different countries, procedures should not, and this is an additional reason for maintaining international standards.

We hope that all who use this book find it useful and informative.

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MS/DH

Introduction and background

The post mortem examination has evolved through a protean range of interest, but remains a benchmark in the study of human disease. Originally performed for predominantly mystical or religious reasons the post mortem then became a vital tool in the teaching of anatomy to medical students. In fact papal bills had to be set out permitting students to dissect human bodies during the fifteenth and sixteenth centuries. Although it was recognised early that such examinations could be used to document the various changes that occurred with disease, it was not until some time later that the link between post mortem findings and clinical symptoms was developed. From that point onwards, with the recognition that organ appearances resulted from tissue changes and the birth of the discipline of Rokitansky's Morbid Anatomy, later expanded in the establishment of the cellular basis of disease by Virchow, the post mortem had become a powerful tool in the study of human disease. Of course during this time the use of the post mortem examination as an essential instrument in the field of forensic medicine also developed.

The post mortem examination has a continuing vital role in the basic study of disease processes, therapeutic response and complications, research, education, genetic counselling and in audit of medical practice in addition to determining the particular cause of death. Apart from these fundamental aspects the post mortem examination is a critical element of epidemiology on which decisions regarding public health are based (recently revisited by Dada and Ansari, 1996) [1].

Despite all these factors the number of post mortem examinations is decreasing at a depressingly rapid rate, particularly in the elderly, with autopsies being performed on only 1 in 3 or 4 people dying in the UK. Currently only 10 per cent of such examinations are performed outside the Coroner's system. These hospital or academic post mortems are becoming so unusual that trainees in histopathology are being exposed to fewer and fewer cases and therefore problems will inevitably arise in the future with inexperienced operators performing post mortems unsupervised.

There are many reasons for the decline in hospital post mortem examinations. Refused consent due to religious or cultural differences seem often to play a part but in fact few religions actually positively take a stand against autopsies. Trying to avoid additional anxiety and grief to the family of the deceased is clearly well intentioned but 88 per cent of families in one study felt they had benefited from knowing the cause of death, had advanced medical knowledge and the families had the reassurance that appropriate medical care had been given.

The increasing costs of the post mortem, the loss of prestige of the post mortem both amongst the public and within medicine and sometimes unreasonably absolute reliance on investigative techniques for premortem diagnosis are probably more important factors. The risk of clinical exposure and possible malpractice lawsuits may also be contributory factors for this decline. It should be remembered however that the procedure continues to identify inconsistencies between clinical and post mortem diagnosis and that several studies have shown that around 10 per cent of post mortems reveal findings that would have significantly changed the clinical management of the patient [2].

Clearly such discordance indicates that mortality data not supported by post mortem examinations must be viewed with caution and autopsies are necessary to ensure the accuracy of death certificates. The post mortem remains the gold standard in evaluating new treatments and diagnostic modalities, and in documenting changing patterns of disease and for these reasons one could argue that now is the time to be performing more rather than fewer examinations. With the advent of increasingly sophisticated pathological diagnostic techniques including numerous molecular biological procedures, valuable resources are being neglected which could extend our knowledge of even well characterised diseases. Furthermore, valuable epidemiological and teaching material is also being squandered.

There have been numerous publications on the subject of the post mortem and many of the more recent document the role of the autopsy in medical audit. These have been followed by several publications assessing the quality of post mortems and the subsequent post mortem reports issued. A Royal College of Pathologists (RCPATH) Working Party has produced guidelines in the UK with recommendations for the contents and issuance of post mortem reports and these were published recently (1993) [3].

Included in these recommendations are a summary of the findings within two days of the examination with a complete report forwarded within 2–3 weeks (4–6 weeks for neuropathological cases which of course require longer for adequate fixation of the brain and spinal cord before slicing). These were suggested in an attempt to give a single standard across the UK. The RCPATH further suggest that there should be minimum standards for every post mortem including a complete standard examination plus any special techniques or investigations that are required. They also recommend that a complete post mortem should be performed on all post neonatal deaths and sudden unexpected deaths. Furthermore, in the UK special bodies have also been established to investigate perioperative deaths, maternal deaths and now infant deaths (and stillbirths), with ongoing audit, in order to promulgate an increase in overall standards and lead to identification of problems with recommended remedies and hopefully thereby reduce future deaths.

Types of post mortem

In the UK around one third of the 550 000–600 000 or so deaths each year will result in a post mortem. These post mortems are split into two main categories with the majority performed at the request of the Coroner. In fact over 90 per cent of post mortems are Coronial. The remainder are hospital or academic post mortems which make up less than 10 per cent of the overall total. The main differences between the types of examination relate to the underlying purpose of the

examination i.e. to establish whether death was natural or unnatural (caused by some external influence) and the histological aspects of the examination (which seem to be the exception in Coroner's cases but should be the rule with hospital post mortems). Implicit with the former is the question of permission (or consent) for post mortem to be discussed more fully later in this chapter. Coroner's post mortems themselves are of two basic types, either standard or forensic (usually "Home Office" cases).

Hospital post mortems should ideally be performed on all patients who die in hospital. In practice few such examinations are requested for the reasons outlined above. In any event for a post mortem to be performed outside of the Coroner's system, the death needs to be certified by an appropriate clinician caring for the patient, the circumstances surrounding death should not indicate referral to the Coroner or referral to the Coroner has been made and the Coroner is satisfied that the certified cause of death is appropriate. Very rarely deaths have been certified by the attending physician and when the case is subsequently passed to the pathologist, the latter has been concerned about an aspect of the factors surrounding death and has been prompted to speak to the Coroner and procure advice. Occasionally the Registrar may also refer equivocal cases to the Coroner. Consent for a hospital post mortem is imperative and issues surrounding this will be discussed below. Once an examination is consented, the hospital post mortem then proceeds under the legislation of the Human Tissue Act of 1961.

Deaths are in fact referred to the Coroner from three main sources: doctors, Registrars and the police. Of the roughly 180 000 deaths that are annually reported to the Coroner, around 60 per cent come through the doctor, 2 per cent by the Registrar and the remainder mostly via the police (Office for National Statistics Newsletter 1996) [4]. No doctor is under a statutory obligation to refer any death but Registrars of births and deaths do have a statutory obligation to refer certain categories of death to a Coroner. These are contained in Statutory Instrument 1987/2088. Doctors do however have a statutory duty to issue a medical certificate indicating the cause of death if they were the attending physician of the deceased during their last illness. They are also strongly encouraged to refer relevant deaths to the Coroner directly in order to avoid delays and inconvenience to relatives and therefore the Office for National Statistics have recently issued guidance for doctors on these matters. This document also discusses the importance of accuracy and clarity in the filling out of the death certificate. It is also stated that, at least in England and Wales, death from AIDS or in an HIV-positive person should not normally be referred to the Coroner unless there are other grounds for referral.

Coronial system

The oldest record of a law officer involved in the circumstances of deaths in the UK is said to appear in 1194, although it is likely that such a position probably existed several centuries prior to that. Most if not all countries have developed similar systems and although the particular cases that require referral to the Coroner or equivalent may differ slightly between continents and countries, the general principles remain the same. In general terms if three main points surrounding a death can be determined then referral to the Coroner is not usually warranted. These are (a) the patient has been seen by a medical practitioner in the last 14 days, (b) the

cause of death is known with some degree of certainty and (c) those concerned with the death are satisfied that the cause was natural. Of the cases referred to the Coroner in this country, around 80–90% result in a post mortem examination taking place.

The coronial system has been introduced and developed as a means of assessing whether a particular death is natural or not and to try to establish a cause of death if possible. The Coroner has a duty to enquire into causes of death in order to satisfy himself that the cause of death is natural, unnatural, criminal, suspicious or potentially litigious. Specific details may differ between Coroners and between countries, but the general principles are very similar. As mentioned above, the actual duty of reporting deaths to the Coroner lies with Registrar of Births and Deaths not the doctor attending the deceased before death, but in practice it is the doctor who usually does or should refer any appropriate case in order to avoid wasted time. It is then at the discretion of the Coroner to decide if further action needs to be taken.

A recent document issued by the Office for National Statistics (1996) [4] regarding death certification and referral to the Coroner includes a table stating that a death should be referred to the Coroner if:

- the cause of death is unknown
- the deceased was not seen by the certifying doctor either after death or within the 14 days before death
- the death was violent or unnatural or suspicious
- the death may be due to an accident (whenever it occurred)
- the death may be due to self-neglect or neglect by others
- the death may be due to an industrial disease or related to the deceased's employment
- the death may be due to an abortion
- the death occurred during an operation or before recovery from the effects of an anaesthetic
- the death may be a suicide
- the death occurred during or shortly after detention in police or prison custody

(A more extensive list is given in Appendix 1)

Within the group of Coroners' post mortems there are two further main types of investigations/examinations; those routine and those criminal. The majority of post mortems are performed because a cause of death cannot be decided with certainty, often in the setting of sudden death, but there are no suspicious circumstances. Even most of those cases where there is an unnatural cause of death such as suicide or road traffic accidents are fairly straight-forward and are often performed by general pathologists not specifically trained in forensic medicine. In other medico-legal situations, it is often at the discretion of the Coroner to direct a forensic pathologist or a home office pathologist to perform the examination.

The number of Coroner's post mortems appears to remain steady unlike the ever-declining numbers of hospital post mortems. This can have a detrimental effect on the quantity and quality of information gained from post mortems for many reasons, not least because there is pressure not to retain tissues or perform histological examination in the vast majority of cases. Extensive neglected educational or research material is being overlooked or lost in this way. Several publications have recently brought attention to this, and the potential consequences and

limitations of this type of system have been addressed in some detail (for example see Chen 1996 [5]).

Medical examiner system

In England and Wales, USA and ex-Commonwealth countries, the Anglo-Saxon legal code is followed with a coronial system as described, with the extension of this system to that of Medical Examiner in the USA. The Medical Examiner however is a person with both medical and legal responsibilities and it is his/her function to establish the manner rather than just the cause of death. Under this system the role of pathologist and Coroner are combined into one and Medical Examiners have both a legal and a medical function. It is for the Medical Examiner to decide if a particular death is an acceptable death. He/she also has to decide if an autopsy is required and if so whether they themselves should perform it or whether it should be delegated to a deputy who then assigns death to a particular cause, be it natural, accident, suicide etc. If there are criminal circumstances surrounding a specific case then it needs to be referred to the district attorney.

Procurator Fiscal system

In Scotland the situation is fairly similar to that in England and Wales, except it is not to local Coroners that relevant deaths should be referred, but these cases should be submitted to the central Procurator Fiscal in order that he/she may carry out an inquiry and decide which investigations may be appropriate. Consequently, there are fewer Coroners-type post mortems performed in Scotland and the proportion of cases referred to the Procurator Fiscal requiring a post mortem is also lower (around 25 per cent).

A document has been produced by the Department of Health of the Scottish Office (NHS MEL (1998) 68) [6] that reminds Health Boards and Trusts about the required action that should be followed, particularly after deaths in hospital, in order for the Procurator Fiscal to decide what further proceedings are necessary to establish the circumstances leading to death. This document also lists which deaths should be reported to the Procurator Fiscal and in fact this list is extensive and involves 17 key points (Appendix 1). This alternative system has evolved because in Scotland, Europe and the other European colonies a different set of rules is followed regarding cause of death, the "Code Napoleon". The Procurator Fiscal is responsible for initiating criminal proceedings in Scotland and therefore is very much concerned with criminality and has less interest in establishing the cause of death in non-suspicious circumstances.

Other systems

In other European countries the policy regarding post mortem examinations is variable but most follow roughly similar principles to those described under one of the categories outlined above. In some however a legal representative, the police and/or a specific Institute of Forensic Medicine are directly involved in the decision-making exercise regarding the performance of a post mortem examination or not.

Notification of death or cause of death

There are also special situations where notification of the death or cause of death is warranted whether it applies to hospital or non-hospital post mortems. Examples of such cases include those which would in fact otherwise be referred to the Coroner e.g. food poisoning, perioperative deaths or certain maternal deaths. Infectious diseases such as meningococcal meningitis, tuberculosis or Creutzfeldt-Jakob disease would not necessarily fall into this group but when dealt with should be notified to the appropriate body through the relevant channels. As mentioned earlier, deaths following a recent (within 28 days) operative procedure in the UK should be included in the National Confidential Enquiry into Perioperative Deaths (NCEPOD). This is an independent body supported by several Royal Colleges and Associations in England and Wales, founded in 1988 which looks at all elements of patient care and subsequent handling of events surrounding post-operative deaths in these countries with subsequent reports published to increase standards. This is a crucial element of audit and local discussion between clinicians and all other care-workers involved in the patients management is strongly recommended. A similar enquiry into maternal deaths (NCEMD) is also ongoing. This is one of the earliest established schemes of audit investigating all aspects of care associated with deaths during pregnancy or within 42 days of childbirth. This is discussed in more detail in a recent editorial [7] and later in a section on maternal deaths in the genitourinary system chapter (see also Bibliography). The Confidential Enquiry into Stillbirth and Death in Infancy (CESDI) is also on-going.

Consent

It is essential to establish whether consent has been given prior to any post mortem examination. When performed at the request of the Coroner or equivalent, consent is implicit with this request since the Coroner is the person in legal possession of the body and no further consent is required from family members or next-of-kin. Indeed relatives cannot interfere with a Coroner's decision if he/she considers a post mortem examination necessary. This may seem harsh but it should be remembered that the main point of the examination is in establishing whether death was due to natural causes and rule out any suggestion of foul play.

With hospital post mortems, the examination should not be started before written documentation is inspected by the prosecutor. Consent forms will vary somewhat depending on local requirements. Most consent forms actually state that the consentee does not object to a post mortem examination rather than just giving permission and this is the recommended format for Post Mortem Declaration DHSS H.C.(77) in the UK. Until very recently most hospitals in the UK based their local request form on the model Post Mortem Declaration Form published by the RCPATH in their report, "The autopsy and audit" [2]. However, the RCPATH has recently produced an updated version of this in their document giving guidelines for the retention of tissues and organs at post mortem examination [8] (see Fig 1.1).

The supplementary parts of the consent form show that this is not just a document allowing the examination, but also includes a declaration which defines the extent of the examination, limits certain aspects of the examination, states whether tissue can be kept at the end of the examination and also authorises reten-

tion of tissue for research purposes or not. If limitations or restrictions are required then the relevant sentence of the declaration/consent form should be deleted or a special consent form provided. If a disfiguring procedure is considered essential to the examination then the person obtaining consent must consider getting specific permission for that procedure and documenting it on the consent form. In the current climate it is becoming more important to be careful with regard to documenting consent for all procedures undertaken during the examination including obtaining consent for the retention of specific organs.

Organ retention has become an extremely emotive issue in the UK recently and will undoubtedly become an international topic for debate before long. It should be remembered however that in some instances organ retention is essential and invaluable in establishing a specific post mortem diagnosis. Detailed examination of retained organs removed at post mortem has over the years provided unrivalled material for teaching and improvements in subsequent clinical care. Having said this, the subject is too complicated and lengthy to allow discussion of all of the philosophical points regarding benefits and problems of organ retention here. In light of the recent debate, the RCPATH has produced a booklet which examines the legal and ethical issues concerning organ retention at post mortem and the reader is directed to this document for guidance [8]. In Annex B and C of the guidelines the RCPATH now give up-to-date models for both the post mortem examination agreement form and a form for post mortem examinations required by law (these are shown in **Figures 1.1a and b**).

Also implicit in consent for post mortem is the absolute necessity for the examination to be carried out by a suitably appointed prosector. The Human Tissue Act 1961 states that the examination should not be performed by anyone other than, or in accordance with instruction of, a fully registered medical practitioner and that hospital post mortems should not be done without the permission of the person in legal possession of the body. This Act also states that tissue should only be removed by a fully registered medical practitioner. The rules governing who should be present at the post mortem for Coroner's cases are stated in the Coroner's rules [9]. Those persons present during hospital post mortems are not so strictly controlled but ideally all involved in the patient's care should be present although this is not usually practicable and common sense should be used when deciding who should be allowed to attend.

The question of who should sign the consent form is usually obvious with a close relative such as spouse, sibling, parent or alternative next-of-kin being approached as it should be the person in legal possession of the body. Apparently, the legal possession of the body could be granted to the occupier of the premises where the deceased actually died or where they currently lie, but clearly this is inappropriate when there are relatives to consult [rights of possession of human corpses is a sticky subject which prompted an editorial in the *Journal of Clinical Pathology* recently [10], to which the reader is referred for a more detailed discussion]. When it is not possible to obtain such written permission because no relatives can be asked, then a representative from the local Health Authority can actually sign the consent form (assuming no objections from the deceased are known).

If there are objections to post mortem from either the relatives or there is knowledge of the deceased's objection prior to death, then as far as possible these objections should be respected. This applies to both written and verbal objections. With objections to Coroner's cases this is obviously incongruous and the examination goes ahead anyway. With hospital cases, however pressing the desire to

obtain consent for a post mortem examination, the written or verbal objection of the deceased should be respected absolutely. With relatives' objections in the absence of known objection from the deceased themselves, the issue is slightly more complex and difficult. Even so it is hardly worth upsetting the determined relatives any more than they already are and their wishes should still be respected.

It is frequently necessary (and is good standard practice anyway) to sample tissue for histological examination in order to confirm the macroscopic diagnosis. Unless specifically prohibited or objected to by the relatives or Coroner, tissue is often retained at post mortem for this reason, but in some cases tissue is retained for research, teaching or therapeutic uses. Once again this procedure is governed by the Human Tissue Act of 1961. Usually a second clause is present on the post mortem consent form specifying whether the relatives have any objection to tissue being retained and this can easily be struck through if appropriate. There is clearly

Agreement to a post-mortem examination

I do not object to a post-mortem examination being carried out on the body of in order to find the cause of death and study the effects of treatment. I understand that this examination may involve **tissue samples or fluids being taken and held for laboratory investigation.**

If the deceased is an adult, has he or she ever expressed an objection to this type of examination (as far as you know)? Yes No

Limited post-mortem examination

You may limit the extent of the examination. The person who gave you this form will explain the options and implications to you.

Do you wish to limit the examination? Yes No

If 'yes', where do you want the examination limited to?

The head

The chest

The abdomen

Organs being taken and held

You may agree or disagree to whole organs being taken for any further examination which could provide a more detailed understanding of the illness.

Tick one of the statements below to indicate whether or not you agree to organs being taken and held.

I do not object to any organs being taken for further investigation if this is necessary to fully understand the cause of death and effects of treatment.

I object to any organs being taken for further investigation.

I object to the following organs being taken for further investigation.
(Please list organs below)

Fig. 1.1a,b. A recommended consent/declaration form to be signed by the most appropriate person (usually the next-of-kin) prior to hospital post mortem (a), a post mortem examination required by law (b). (With permission from the Royal College of Pathologists, London.)

Disposal of any tissue or organs taken

After any further investigation of tissue or organs taken, those tissue samples or organs must be disposed of in a lawful way. You can either arrange this yourself or the hospital can do it.

Tick one of the statements below to show how any tissue samples or organs should be disposed of.

- The hospital may dispose of the tissue samples or organs in a lawful and respectful way.
- I will arrange for the tissue samples or organs to be disposed of in a lawful way.
- I prefer the tissue samples or organs to be reunited with the body before it is released, even though this may delay the funeral.

Medical research and education

You may agree or disagree to some tissue, fluids or organs being taken and held for an unlimited time for medical research and education.

Tick one of the statements below to show whether or not you agree to any tissue, fluids or organs being taken and held for medical research and education.

- I do not object to any tissue, fluid or organ being taken for medical research and education.
- I object to any tissue, fluid or organ being taken for medical research and education.
- I object to the following tissue, fluids or organs being taken for medical research and education. (Please list the tissue, fluids and organs below)

<p>.....</p> <p>.....</p>

Please read the 'Information for Relatives' attached before you sign this form.

<p>Your signature:</p> <p>.....</p> <p>Relationship to deceased:</p> <p>.....</p> <p>Date:</p>	<p>Witness's signature:</p> <p>.....</p> <p>Name:</p> <p>.....</p> <p>Position:</p> <p>.....</p>
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Fig. 1.1a (continued)

a fine line on occasions between retaining tissue for truly diagnostic purposes and reasons of personal curiosity on the part of the pathologist. In such circumstances common sense should prevail and if any doubt is present it is prudent to contact the clinician or other relevant person involved in the case for their opinion, or simply to refrain from retaining tissue.

Organs removed for purposes of transplantation should rarely pose a problem for the pathologist since they will almost certainly have been removed prior to receipt of the body in the mortuary. One situation in which the pathologist may be involved in such a situation is the case of corneal explants. Once again however it is usual for an external person to come to the mortuary to remove the corneas either before or after the pathologist performs the post mortem. This person has to be a fully registered medical practitioner (Human Tissue Act 1961).

For post-mortem examinations required by law

Name of deceased

Disposal of any tissue or organs taken
After any further investigation of tissue or organs taken, those tissue samples or organs must be disposed of in a lawful way. You can either arrange this yourself or the hospital can do it.
 Tick one of the statements below to show how many tissue samples or organs should be disposed of.

The hospital may dispose of the tissue samples or organs in a lawful and respectful way.

I prefer the tissue samples or organs to be reunited with the body before burial or cremation, even if this delays the funeral.

I will arrange for the tissue samples or organs to be disposed of in a lawful way.

Medical research and education
You may agree or disagree to some tissue, fluids or organs being taken and held for an unlimited time for medical research and education.
 Tick one of the statements below to show whether or not you agree to any tissue, fluids or organs being taken and held for medical research and education.

I do not object to any tissue, fluid or organ being taken for medical research and education.

I object to any tissue, fluid or organ being taken for medical research and education.

I object to the following tissue, fluids or organs being taken for medical research and education. (Please list the tissue, fluids and organs below)

Your signature: Relationship to deceased: Date:	Witness's signature: Name: Position:
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Fig. 1.1b

Requirements of mortuary building, clothes and instruments

The main influences on the design of the mortuary depend upon the number of cadavers passing through the building and the number of cases that come to post mortem. Post mortems are performed either in a hospital setting or in a public mortuary, usually attached to a Crematorium or Coroners' Court. The requirements of a particular hospital mortuary reflect the size of the hospital and the population of patients within that hospital. For example a large geriatric hospital will require more space than a small surgical hospital. The mortuary design not only reflects the number of deaths occurring in the hospital, but in most hospitals

should also take into account the number and type of post mortems and allow ample space for viewing.

There are specific recommendations and requirements regarding mortuary set-up which are laid out in the Department of Health's document *Mortuary and Post-mortem Room*, Health Building Note 20 published by HMSO (1991) [11]. These recommend that there should be four storage spaces for every 100 hospital beds, although this of course does not allow for the actual numbers of Coroner's cases performed (the bodies often being transported to the mortuary from outside the hospital). There should be two post mortem tables per 400 hospital beds or for every 450 deaths per year. This publication also gives recommendations and regulations concerning temperature control for the storage of bodies and ventilation system within the mortuary. The building itself should be fairly inaccessible to the public and secure from wandering or disorientated passers by. It should however be convenient for undertakers and others who may have day-to-day business in the mortuary.

Facilities

The general facilities required are fairly standard between mortuaries, but some will require additional features (such as those for high risk cases to be discussed later). For most basic mortuaries, there should be adequate space and equipment for the receipt, storage and transport of bodies, the performance of post mortems and the viewing of bodies by relatives and friends. The layout of the building is important so that all of these necessary functions can carry on independently and simultaneously. A large area is required for the release of bodies to undertakers, usually with adequate room for the latter's vehicle to enter the building itself (Figure 1.2).

It is useful if the storage refrigerators have two doors, at one side leading to the post mortem room and the other opening onto the general transit area so that the



Fig. 1.2. Transit area and storage facilities within the mortuary.