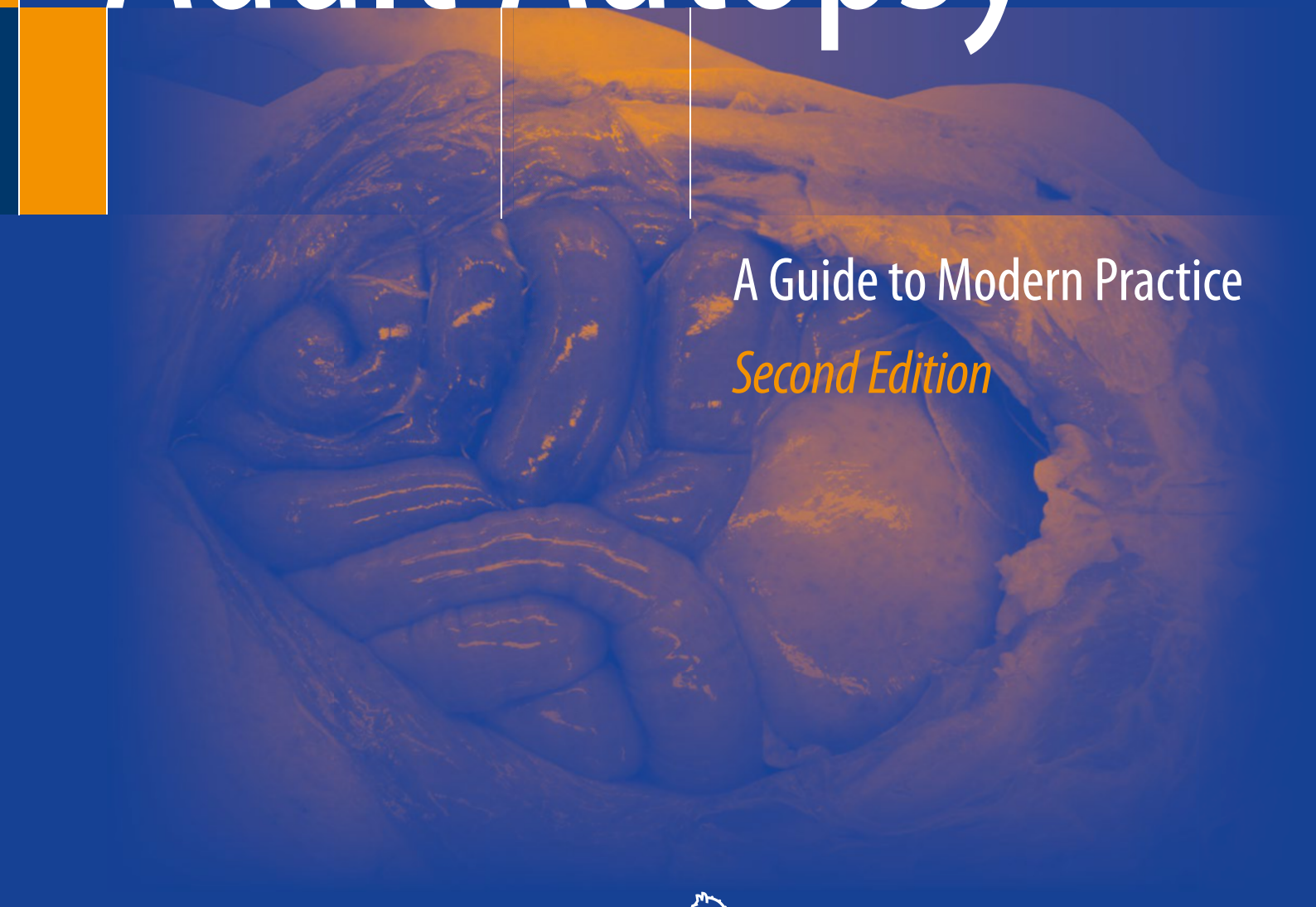
S Kim Suvarna
(*represented by* Grace Horne)
Abigail K. Sharp
*Editors*

# Atlas of Adult Autopsy

## A Guide to Modern Practice

*Second Edition*



Springer

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S. Kim Suvarna (represented by Grace Horne)
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## A Guide to Modern Practice

Second Edition 2024

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*Dr. Abigail K. Sharp—To Tom, Dad, Jo, and Chrissy, my biggest cheerleaders.*
*Prof. S. Kim Suvarna—To Seonaid, Maxine, and Grace, for all their support.*

## In Memoriam

Lauren Muney—silhouette artist

*Professor S. Kim Suvarna*
*1960–2024*
*Professor Suvarna was diagnosed with an incurable malignancy whilst in the early stages of working on this second edition. He continued to work on this book until a few weeks before his death in January 2024 because he believed it to be a valuable contribution to the literature on autopsy, particularly as a guide for those learning evisceration and dissection techniques.*

# Preface

The autopsy, and indeed the training in this area of medical practice, for me has always been a particular area of interest. This aspect of pathology straddles consent and medicolegal autopsy practice and has been a bedrock of understanding disease for the past few centuries. Unlike virtually every other aspect of medical practice, it remains like that performed historically (certainly over the last 100 or more years).

Despite this, it is clear that the classic dissection-style autopsy is in decline. This decline reflects advances in antemortem special tests (blood work, surgical biopsies, radiological techniques, etc.) that provide an improved insight into internal pathology than previously existed. Another factor has been the objections from some religious groups and the public disquiet about the practice of a few pathologists who have created a scandal at some centres, with the result that a number of 'consented' autopsies, relying on permission from relatives, have fallen. Contrastingly, and certainly in the UK, the medicolegal autopsy has continued to be used widely.

It is still considered to have a vital place in terms of the evaluation of disease and can highlight undeclared pathologies. The autopsy also has a role in teaching pathologists and students of medicine, providing access to tissues for research, helping with medicolegal queries and in validating antemortem tests.

What has changed in the past century is that the macroscopic autopsy is now assisted by a variety of special tests. Furthermore, the autopsy can be augmented not only by the standard of microscopy but also by immunohistochemistry, microbiology (for bacteria, fungi, viruses, and other organisms), serological studies, genetic studies, and mass spectroscopy to name but a few of the available tests, and all can be recorded by photography.

However, it could be argued that the autopsy is at a crossroads currently. Alongside the better understanding of disease, driven by molecular antemortem tests and modern imaging, there is a view that the 'gold standard' invasive autopsy may be less relevant. Certainly, digital autopsy techniques, especially CT radiology, are now coming into play, and diminishing the need for invasive studies.

If the autopsy is in decline, then the opportunity to learn by seeing and doing will diminish and pathologists are coming to active practice with far less experience than previous trainees enjoyed. In an arena where competence is recognized to be experience-driven, this could be a problem. The aim of this book is therefore to provide a training standard of the protocol for an autopsy in the form of a manual of current practice. The atlas layout hopes to provide insight into the pathological lesions that may be found at autopsy to aid in case examination. It attempts to deal with the various aspects of the autopsy in terms of grouped areas for dissection and special investigations. It also endeavours to cover the basics of forensic pathology, the radiological autopsy, histology, and toxicology. It is hoped that it will support students and provide trained practitioners with a ready reference. It is primarily aimed at practising pathologists, particularly in training grades. It may have value to those working as anatomical technicians in autopsy suites, as well as parties with a legal interest in autopsy practice. I would hope this atlas will be a helpful resource for those approaching the practical examination of autopsy practice assessment in the UK and the equivalent further afield.

The images and data in a book of this size cannot be all-encompassing, but the majority of common lesions are displayed, along with some rarities. Most of the images are derived from autopsy cases, with a few images from surgical cases. Most images are largely left to speak for themselves, but, where provided, the red reference bar is 10 mm.

Suggestions for further reading and references are also provided. One is mindful that autopsy pathology is often the same pathology as seen in the living, but simply demonstrated in the deceased. It follows that a good grounding in general surgical pathology is required to be a competent autopsy practitioner. There are so many books one could recommend in this arena, but only a few are cited, and it is left to the readers to select their favourites to add to their understanding of autopsy cases.

It is important, given occasional scandals (Alder-Hey, Bristol) and conflicts with social and religious custom, that each autopsy is appropriate and respectful. It is vital to remember that the deceased was someone's mother, father, daughter, or son. This author believes that the deceased should be afforded the same status as any other patient. Due respect must always be given, and one must have an open attitude about discussing cases with the bereaved and with medicolegal agencies, other relevant medical authorities, family practitioners, and society in general. That does not mean open access, and it is important that the autopsy is not abused for inappropriate commentary or gratuitous display.

Knowledge of the method by which one undertakes a high-quality autopsy will undoubtedly remain part of twenty-first-century medical practice, but this expensive and time-consuming technique needs to find its place in the ever-increasing range of medical investigations that can be performed. Ultimately, it is hoped that this atlas will be of use as a reference for the next generation of pathologists and anatomical pathology technicians, as well as for medicolegal practitioners and others.

Sheffield, UK S. Kim Suvarna

# Acknowledgements

A book such as this, especially in the circumstances it was prepared, is an example of team effort and the culmination of many people's hard work.

Weeks after learning of Kim's devastating cancer diagnosis, he asked if I would join him as a co-editor for this second edition. Kim believed passionately that this book was a valuable addition to the autopsy literature, and he worked on his chapters tirelessly in his final months of life. He showed me the ropes of editing and built my competence and confidence to continue after he died. I am grateful to him for this mammoth opportunity. His pathology legacy continues in this book and in the minds of many of us who were trained by him.

To the chapter authors of this edition, my appreciative thanks for sharing your expertise, contributing images and your attention to detail. I could not have completed this without you all. Your efforts have been instrumental in compiling this work and I have appreciated every encouraging email you have sent, of which there have been many. This enthusiastic group of colleagues, near and far, has risen to the challenges of their chapters, sometimes in the face of significant personal grief around the time of Kim's death. The chapters have received updates with inclusion of new images to complement and upgrade the previous edition's content. Kim was especially excited for the addition of a post-mortem histology chapter and I am particularly grateful to Esther for providing a whole chapter's worth of high-quality images and commentary.

My grateful thanks go to the staff at Springer (especially Anand Shanmugam, Dhanushya Vijayakandeepan, Robert Donkersteeg, Melissa Morton, and Emily Wong), for your patience as you have guided me in this role and worked to bring this project to completion.

The entire medicolegal autopsy team in Sheffield has been pivotal in seeing this book to completion. A giant thank you to my supportive autopsy pathologist colleagues and the autopsy-interested trainees in Sheffield, UK. Special thanks go to those working in the dissection room in the mortuary in Sheffield: Maxine Coe, Joanne Dawn, Nigel Prestidge, Sally Smith, Tim Wild, and Paul Wood. I know Seonaid Ashby provided her usual outstanding secretarial support in preparation for this second edition and I am indebted to you for typing Kim's dictations, making the process significantly smoother. Additional thanks are expressed to the various coroners across the UK, but in particular, Mrs. Rawden (HM Coroner for South Yorkshire, West). The coroners have provided us with the opportunity to work and train with very interesting cases. I expect there are people who contributed to this project even before I became involved; to those who assisted in any way, I give my thanks.

One must not lose sight of the fact that the images from this book are almost all derived from the deceased. Immense gratitude is expressed to the relatives who have given consent for images to be retained and used to teach the pathologists of the future. This generosity cannot be understated.

Thanks also go to Grace, Miranda, and Elara Horne for welcoming me into your home at the most difficult of times and supporting Kim in working on this book in his final months. He often spoke of the three of you, whilst at the dissection bench or in the histopathology department, recounting your current goings on and celebrating your achievements in the workshop, university, school, and work. He was so proud of each of you. I am indebted to Elara Horne for

her photo editing skills, ensuring that confidentiality has been afforded to the deceased and giving uniformity to the figures in this book.

And finally, to my family and friends, who treated me with understanding and supported me to choose my laptop over quality time for the sake of completing this book, a chunk of which was written with baby Henry in one arm, I am so grateful. Thank you for your gentleness in the face of a difficult time.

Sheffield, UK Abigail K. Sharp

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# General Considerations and Safety

1

Maxine S. Coe and S. Kim Suvarna

## Introduction

Preparation for the autopsy and consideration of the case, before entering the autopsy room or putting knife to skin, are key in getting the best results from the examination. This chapter commences with the components of an instruction to perform an autopsy. The relevant paperwork (usually legal and/or consent permissions) is discussed.

The practical realities of completing an autopsy require a modern, well-lit, ventilated and dedicated room or facility for this examination; views of some facilities are shown. Other requirements are appropriate clothing, protective face masks, gloves, and other body-wear. The standard tools and the workstation are presented. This process permits a safe working environment for the autopsy practitioner and will enable the pathologist or technician to efficiently examine the case.

All these efforts will maximize macroscopic information, but additional tests are often required to realize the full potential of the autopsy. The role of specialist investigations (histology, toxicology, microbiology) is described, and macroscopic photography is also considered. Finally, the methods for recording the data derived are described.

## Paperwork: Permissions and Instructions

Before starting the autopsy, it is vital to confirm that there is a clear instruction to perform the examination from the relevant authorities. This data may come from legal sources (e.g. for the United Kingdom; HM Coroner or Procurator Fiscal), the police, or another state body. Alternatively, it may be driven by a request from the medical staff or relatives; in the form of a "consent" autopsy.

## Identification

As with all medical procedures, identification of the body in question is required, using a variety of different case identifier data. The name, date of birth and relevant hospital number may be important. However, other identifying information may come from third parties (confirming the identity of the deceased). Specific body features, including piercings, tattoos, dentures, and other identification elements, may be relevant in allowing certification of identity. Correlation with a previous photographic record (e.g. passport, identity cards, or other resources) is sometimes of use.

Ideally, bodies are retrieved soon after death, and little decomposition will have occurred. However, some bodies will have been significantly degraded with autolysis and maggot infestation. In such circumstances, other data such as dental record comparison, registry numbers of implants or evidence of prior disease events or correlates may be needed.

Once confirmation of identity has been established, the body is 'booked-in'. This necessitates the assignment of the body to a unique case identification number (e.g., 679H/24, reflecting the case number given, with a check letter and the year).

The body, usually identified by a name label or bracelet, is then stored to await examination. Bodies are normally stored in refrigerators, generally at 4 °C (40 °F). Alternatively, if storage is needed for a prolonged period, then freezing at −20 °C (−4 °F) is appropriate.

S. Kim Suvarna was deceased at the time of publication.

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## The Background Story

The examination generally follows review of information from those requesting the examination, and/or consideration of the clinical record and medical history data. This may yield not only information to guide the examination in terms of likely pathology, but also information that may be pertinent to various infection risks for those working in the autopsy suite. Consideration of potential risks in the form of various viral infections (drug users, those brought back from abroad, etc.) may be of importance. Nevertheless, *in all cases* the various risks of infection must be assessed before examining a body.

Cases with category 1 and 2 infections can proceed without special measures. Category 3 risk cases need additional clothing and protection. Ideally, such cases should be performed by those with appropriate experience. Category 4 risk cases should be examined only by experienced practitioners in specialist facilities with the appropriate techniques and safety measures. It cannot be over-emphasized that caution with all cases must be the standard for working in the mortuary, and relevant immunizations are mandatory for all personnel.

## Getting Ready

One cannot perform autopsies wearing one's own clothing. The mortuary must provide clothing designed to be comfortable and yet protective for the staff. At this point, it is worth stressing that there should always be at least two people in the autopsy room when it is active, for safety reasons.

Fresh clothing (usually theatre scrubs, stored in dedicated changing rooms with wash and shower facilities) should be worn, with an outer gown. Layers of flexible waterproof and stab-resistant (Kevlar/chainmail) gloves must be worn. Additional waterproof lower arm covers are recommended. Face covers (generally masks and visors) are required, and one may also select hair/beard nets or caps. Specialist masks may be required for various infection risks. It should be noted that facial hair (including beards and stubble) can cause difficulties with some respiratory protective equipment requiring a good seal to the face which may necessitate alternative equipment such as a battery-operated full facial unit. A waterproof apron must be worn, covering the torso and legs, down to below the top of waterproof wellington boots (with toe protection).

## The Autopsy Room, Workbench, and Autopsy Table

The autopsy room, along with adjoining dedicated transitional rooms, must be available. The layout of an autopsy room needs good lighting, down-draft ventilation, running water, work surfaces capable of being chemically cleaned and sterilized, nonslip flooring, and space to work.

The workstation should be equipped with a range of scalpel blades and other long knives. There should be scissors (various sizes) and 'toothed' forceps. A ruler, measuring jug and accurate electronic scales are vital. A range of bowls, ladles, string, wire-cutters, saws, shears, and other instruments must be available.

A digital camera is particularly valuable in the autopsy room to record the stages of dissection, as well as specific lesions or gross morphology. Imaging is of vital importance in some cases that have a legal bearing, such as in cases of surgical procedures with complications, retained foreign bodies, and to demonstrate absence of such occurrences.

## Additional Testing Materials

Within easy reach should be containers for swabs, culture bottles, toxicology kits, formalin pots and tissue cassettes.

Histological examination is a common adjunct to the autopsy. This test requires the availability of formalin and appropriately numbered cassettes for securing the samples taken. The cassettes should be identified in terms of the case number and the cassette number (e.g., case 679H/24 A1, where the designator A1 is the cassette number that can be specified with regard to the contents). The tissue type and number of tissue fragments should be recorded for the content of each cassette. Standard paraffin-based tissue processing is commonplace. However, glutaraldehyde for electron microscopy may also be relevant. Handling tissues for frozen section must also be possible.

Microbiology samples may be taken in possible cases of bacterial, fungal, or viral disease. Those with a significant infection risk (e.g., Category 3 risk) must be labeled accordingly.

Toxicology tests may also be needed, with samples of various body fluids (vitreous, blood, cerebrospinal fluid, urine) and tissues being reserved for analysis.

Rarely, other specialist techniques find their way into the autopsy room. For example, samples may be taken for mass spectroscopy (e.g., metal analysis) or serology (e.g., hormone assay, serum tryptase).

## The Results

Examining a body will generate a lot of information, such as organ weights, pathology descriptions and measurement. These must be annotated, by tape or digital recording or by writing onto a standard proforma (see Appendix).

The paperwork or recording must itemize whether samples have been taken. If so, the type and number of samples should be stated. At this point, one may be able to provide a cause of death, which should be in the standard format (i.e., 1a, 1b, 1c, 1d and 2).

Figures 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 1.19, 1.20, 1.21, 1.22, 1.23, 1.24, 1.25, 1.26, 1.27, 1.28, 1.29, 1.30, 1.31, 1.32, 1.33, 1.34, and 1.35 illustrate the points made in this chapter.

**Fig. 1.1** A toe tag attached to the body is seen with some of the numerical patient data of the deceased. The patient's name is on the reverse of this form

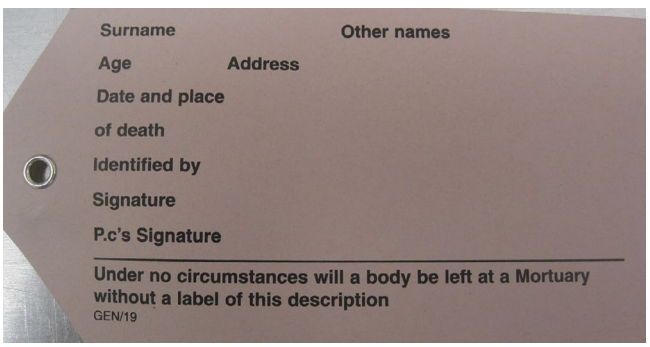



**Fig. 1.2** The tag should show relevant identifier data: full name, place and date of death, address and confirmation as to how the identification was verified


**Fig. 1.3** Additional data may be added to the body, such as this coloured band added to the wrist or ankle containing relevant details of the deceased, including the case number, height, and weight


**Fig. 1.4** The arrival of a body from a medical unit often comes with bar-coded identifier wrist bands and other information. The name in this case has been obscured intentionally

**Fig. 1.5** Additional information confirming the person's identity may be seen in the form of external jewellery (e.g. metal ear rings or piercings)

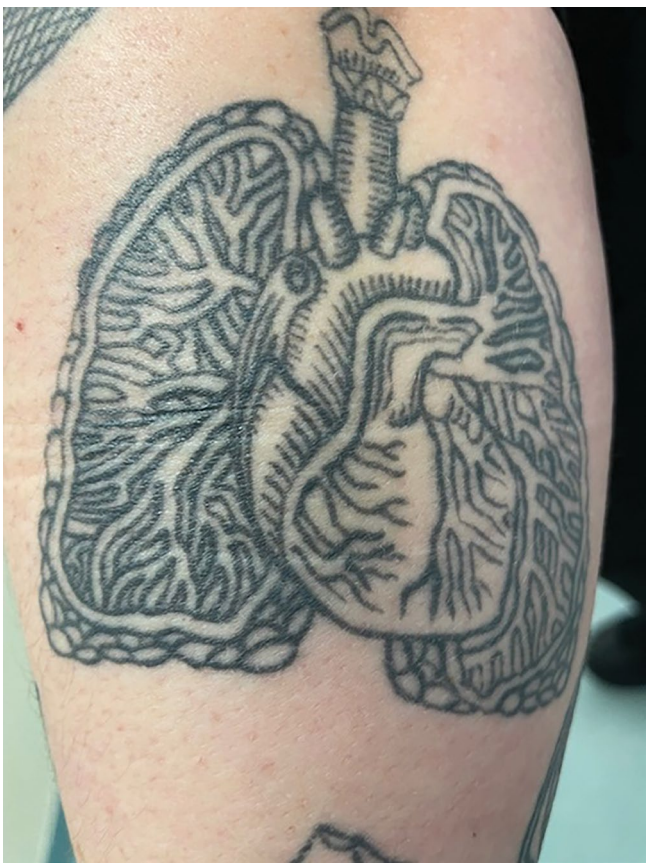


**Fig. 1.6** Tattoos are also a good identifier, particularly if unique or unusual. This arm tattoo of the heart and lungs is not a common design and may be helpful when correlating to other information about the deceased or photographs taken in life

**Fig. 1.7** The body may have a variety of distinguishing marks that aid identification. This image shows the front of the chest with multiple nipples

**Fig. 1.8** Even badly decomposed bodies may contain useful clues for identification, including dental work. Here the mouth is seen to have dental amalgam filling and a gold tooth

**Fig. 1.9** Teeth-straightening retainers and dentures, as seen here, are common at autopsy and can be used for identification purpose

**Fig. 1.10** Amputations and other scars may serve to confirm identity, particularly when matched to hospital records

**Fig. 1.11** Often the body may be fully or partly dressed. This can be mapped against witness information as to the clothes the deceased was last seen wearing. Precautions must be taken when removing clothing from a body. The pockets may contain sharp objects or may be covering jagged, protruding bone. One should use forceps to expose pocket contents

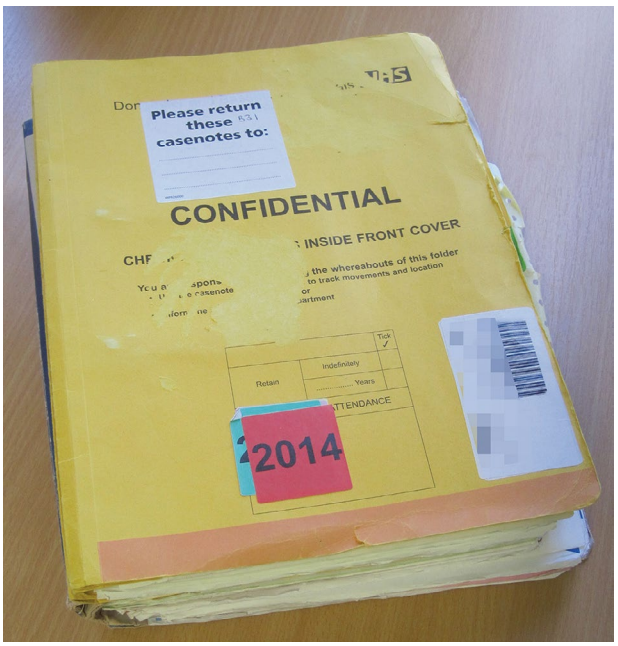



**Fig. 1.12** The notes of the deceased often contain the abundant medical, nursing, and other data that help to identify the deceased. The clinical record may also point to hazards to be considered before the autopsy (e.g., infection risks)

**Fig. 1.13** An example of body storage is shown here, with a refrigerated compartment containing horizontal tiers of roll in/roll out trays. The tray travels with the body during the stay in the mortuary. The trays and bodies are usually arranged in tiers of three to five and vary in size to accommodate bariatric bodies. The units have doors at the head and feet ends. They are run at a temperature of 4 °C (40 °F) or freezer temperature of −20 °C (−4 °F)

**Fig. 1.14** The acceptable minimum protective clothing to perform a post mortem: scrub (tunic and trousers); trousers tucked inside reinforced (toe-cap) wellingtons and plastic apron close to the floor; gloves and oversleeves. There should be a mask with an attached or integral clear plastic visor to cover the face

**Fig. 1.15** Pathologists wear an additional gown that helps to differentiate them from the technicians

**Fig. 1.16** This photograph of a mask and inbuilt visor shows the importance of protecting the eyes and the mouth. The visor has prevented small blood splashes from striking the face

**Fig. 1.17** This image shows a specialised mask being used in Category 3 risk cases, with separate clear goggles, and a hair net. Covering the hair provides additional protection

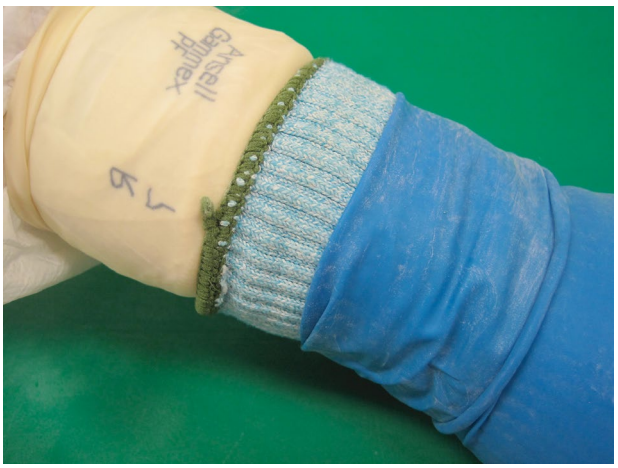


**Fig. 1.18** Layering of the gloves limits the risk of cutting and of tissue fluid penetration to the operator's skin. Here, the inner beige surgical glove sits next to the skin. Then there is a Kevlar (or chainmail as an alternative) glove. Finally, there is a heavy duty waterproof blue glove. This ensemble will interlock with the oversleeves and afford good protection for those working with body dissection

**Fig. 1.19** Dealing with high-risk cases may require additional measures for protection. Here, a disposable suit is worn over the standard mortuary wear. In cases with high risk of infection, if one wishes to use a battery-operated full facial unit, it should be put in place before entering the autopsy room

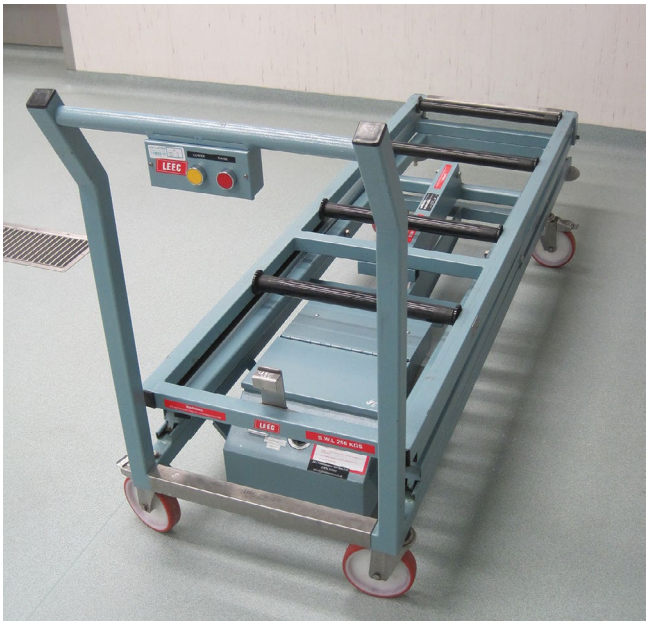


**Fig. 1.20** Moving bodies around in the mortuary requires safe working practices to avoid mortuary staff injury. A hydraulic unit, as shown here, is employed to allow the fridge tray and body to be moved safely to the operating station

**Fig. 1.21** The general layout of a post mortem facility is seen, with a central dissecting station. There is good lighting, drainage and access to fridges and other equipment. For illustration purposes in this view, there is a ladder for an assistant to take photographs during dissection. Dissection tools and other equipment are on a mobile trolley

**Fig. 1.22** Shown here is an example of a 3-fixed station and 2-trolley station post mortem suite, allowing for multiple autopsy examinations to occur simultaneously, sometimes with multiple pathologists. This type of set up is particularly important with consideration for major incidents, allowing for the disaster victim identification team to work collaboratively

**Fig. 1.23** The dissection trolley layout shows the instruments that can be used during the autopsy

**Fig. 1.24** After evisceration, the organs are often carried to a separate work area, allowing the autopsy assistant to start reconstructing the body. The work area should be well lit, with down-draft ventilation and good access to running water and drainage. All surfaces (as with other areas in the mortuary) are capable of chemical cleaning and sterilisation later

**Fig. 1.25** The pathologist dissection bench is shown with the essential instruments for examination. These include a large or long knife, scissors, small and large scalpels, forceps, sponge, and ruler. Also needed are local access to running water, a measuring jug and histology cassettes

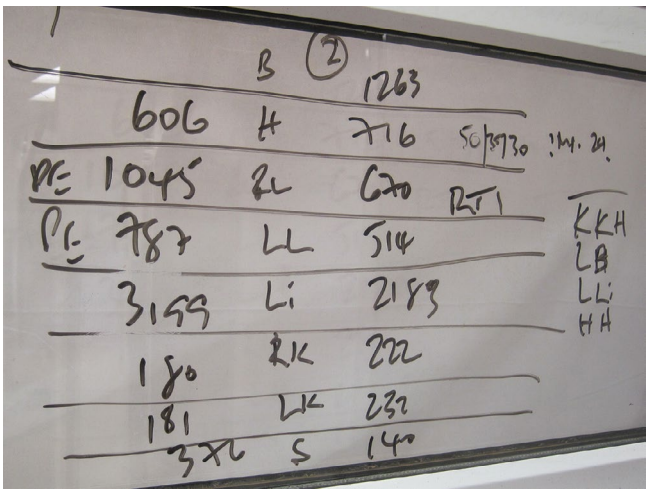


**Fig. 1.26** Recording of weights and other notes during the examination can be made on wipe-clean surfaces using nonpermanent markers


**Fig. 1.27** This two-tiered sample trolley contains materials for additional tests. The upper shelf has syringes, needles, blood culture bottles, cassettes for histology, and swabs for bacteriology and virology. The lower tier holds specimen pots for histology samples, together with containers or tubes for blood, urine, tissue, and faeces

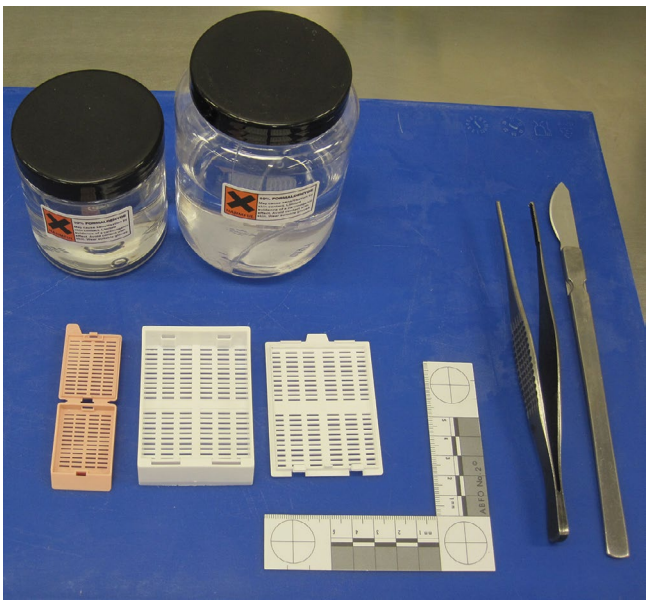


**Fig. 1.28** Histology cassettes of different sizes are used to ensure that the amount of tissue taken can be processed appropriately. The smaller (standard) pink cassettes are generally used for thumbnail or smaller tissue fragments. The larger white cassettes are useful for larger samples that merit large area architecture analysis (e.g., samples of brain, lung, and heart). Sharp scalpel blades and forceps should be used when samples are taken for histology

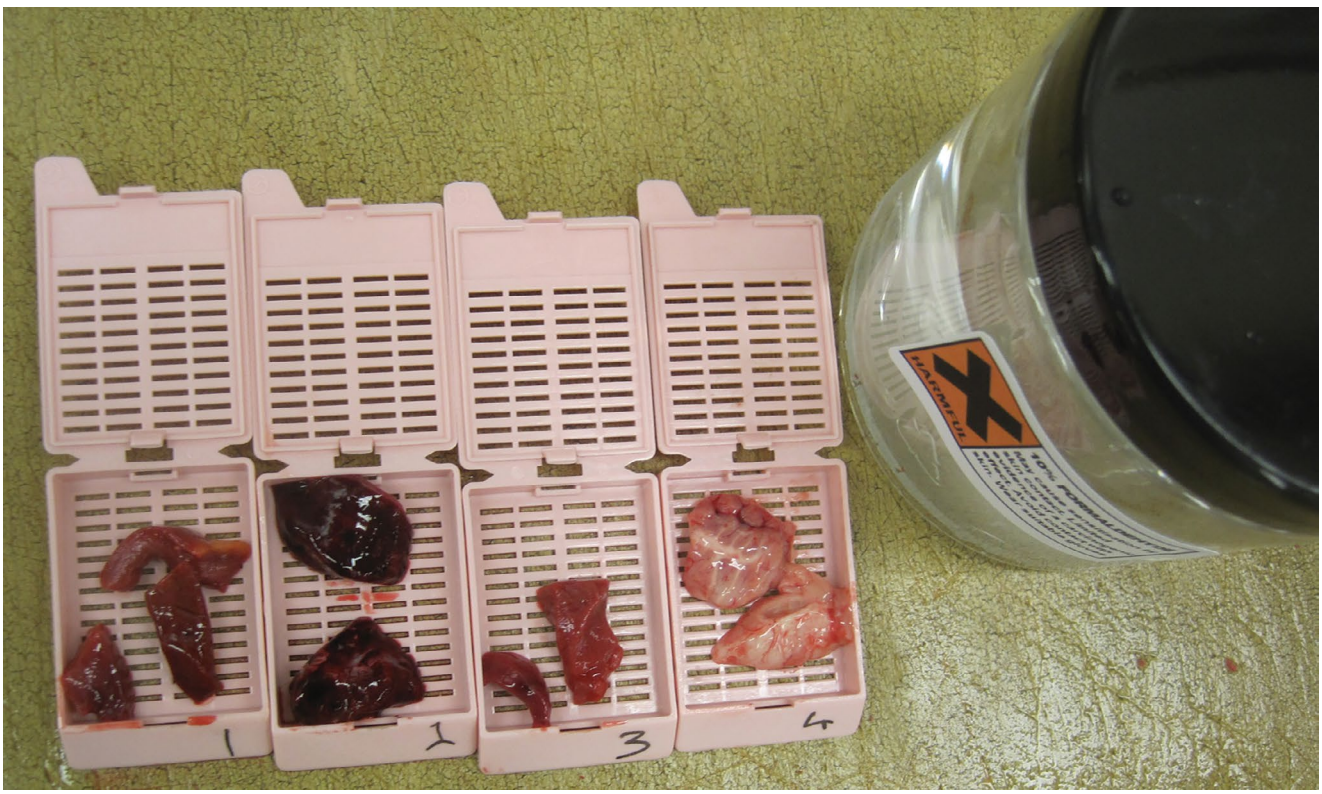



**Fig. 1.29** The samples of tissue for histology may be placed in cassettes in single pieces, or, as in this case, as multiple fragments. The tissue samples should be recorded ideally. This multiple sample technique means that special stains may be used on multiple bits of tissue with only one additional slide per stain being needed

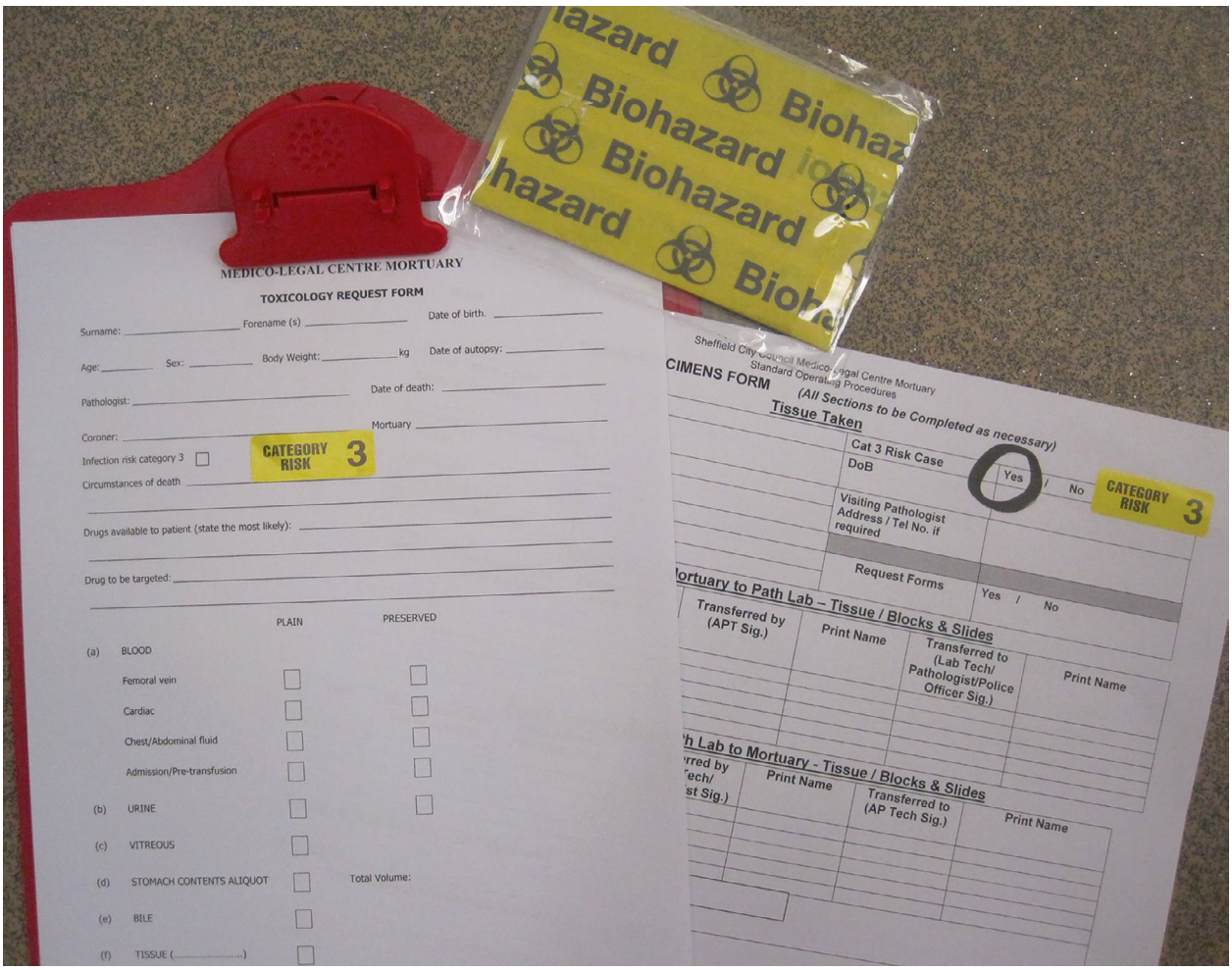



**Fig. 1.30** Any samples that are taken must have the correct corresponding paperwork to accompany the specimen to the laboratory. High risk cases must be labelled with high risk (yellow) stickers to alert laboratory staff to risks and dangers

**Fig. 1.31** A messy workstation (here mocked-up for illustration purposes) poses a risk to others. Aside from the widespread contamination of the work area, the discarded and contaminated blades pose a significant hazard. This is not good practice


**Fig. 1.32** Different types of camera can be used in the autopsy room. In recent years, compact digital cameras have good resolution and autofocus, comparing favourably with single lens reflex type cameras. For health and safety reasons, cameras ideally should not be removed from the autopsy room. Data should be remotely downloaded and stored onto a secure (often encrypted) computer

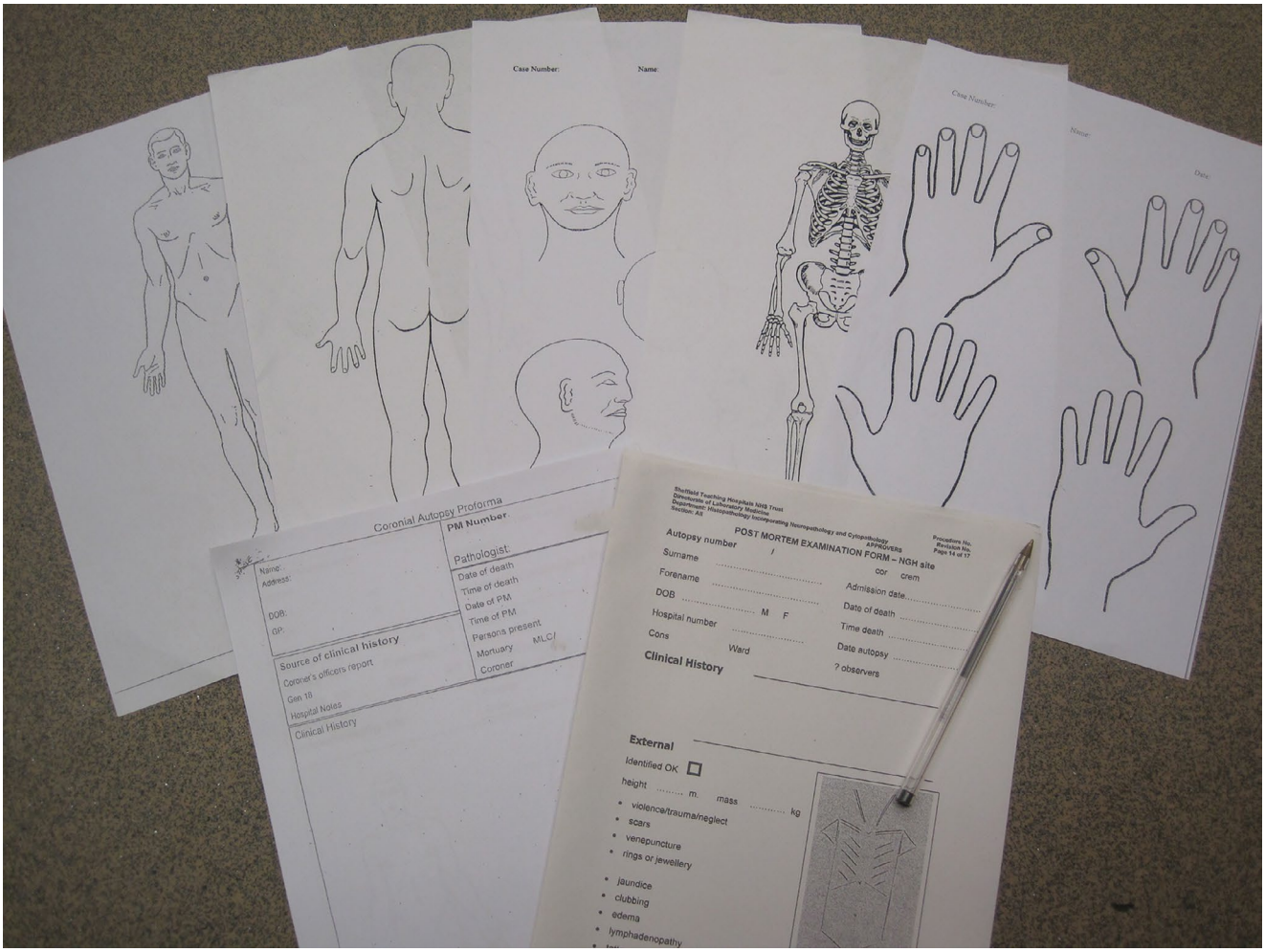
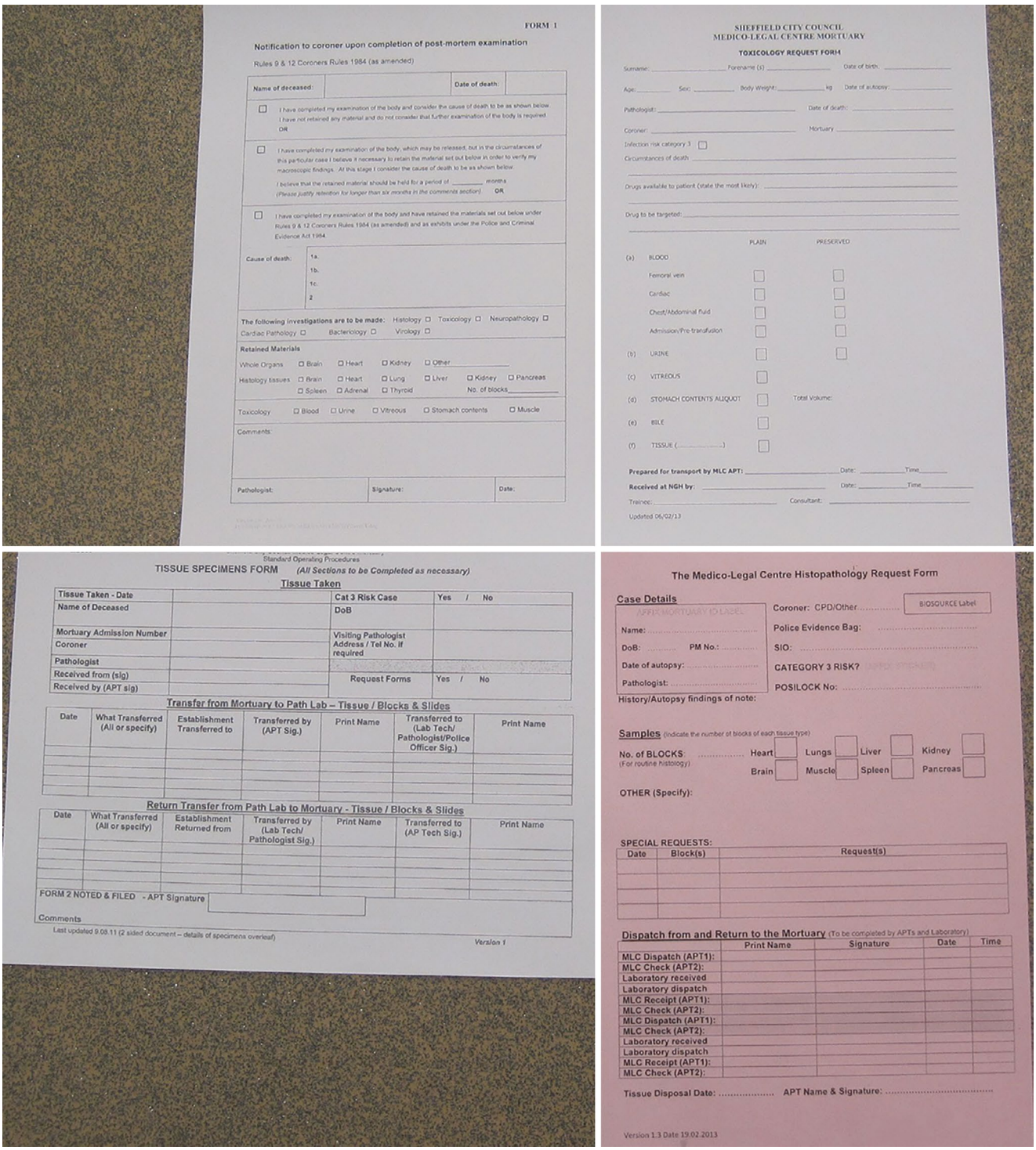



**Fig. 1.33** Paperwork at the completion of the examination will vary depending on the standard operating procedures of the department. The basic paperwork includes sheets for data and results, and anatomical diagram proformas



FORM 1

Notification to coroner upon completion of post-mortem examination

Rules 9 & 12 Coroners Rules 1984 (as amended)

Name of deceased: Date of death:

I have completed my examination of the body and consider the cause of death to be as shown below. I have not retained any material and do not consider that further examination of the body is required. OR

I have completed my examination of the body, which may be released, but in the circumstances of this particular case I believe it necessary to retain the material set out below in order to verify my macroscopic findings. At this stage I consider the cause of death to be as shown below.

I believe that the retained material should be held for a period of _____ months (Please justify retention for longer than six months in the comments section) OR

I have completed my examination of the body and have retained the materials set out below under Rules 9 & 12 Coroners Rules 1984 (as amended) and as exhibits under the Police and Criminal Evidence Act 1984

Cause of death: 1a. 1b. 1c. 2

The following investigations are to be made: Histology ☐ Toxicology ☐ Neuropathology ☐ Cardiac Pathology ☐ Bacteriology ☐ Virology ☐

Retained Materials

Whole Organs ☐ Brain ☐ Heart ☐ Kidney ☐ Other

Histology tissues ☐ Brain ☐ Heart ☐ Lung ☐ Liver ☐ Kidney ☐ Pancreas ☐ Spleen ☐ Adrenal ☐ Thyroid No. of blocks

Toxicology ☐ Blood ☐ Urine ☐ Vitreous ☐ Stomach contents ☐ Muscle

Comments:

Pathologist: Signature: Date:

SHEFFIELD CITY COUNCIL
MEDICO-LEGAL CENTRE MORTUARY

TOXICOLOGY REQUEST FORM

Surname: Forename (s): Date of birth:

Age: Sex: Body Weight: kg Date of autopsy:

Pathologist: Date of death:

Coroner: Mortuary

Infection risk category 3 ☐

Circumstances of death:

Drugs available to patient (state the most likely):

Drug to be targeted:

| | | PLAIN | PRESERVED |
|---|---|---|---|
| (a) | BLOOD | | |
| | Femoral vein | ☐ | ☐ |
| | Cardiac | ☐ | ☐ |
| | Chest/Abdominal fluid | ☐ | ☐ |
| | Admission/Pre-transfusion | ☐ | ☐ |
| (b) | URINE | ☐ | ☐ |
| (c) | VITREOUS | ☐ | |
| (d) | STOMACH CONTENTS ALIQUOT | ☐ | Total Volume: |
| (e) | BILE | ☐ | |
| (f) | TISSUE (.....) | ☐ | |

Prepared for transport by MLC APT: Date: Time:

Received at NGH by: Date: Time:

Trainee: Consultant:

Updated 06/02/13

Standard Operating Procedures

TISSUE SPECIMENS FORM *(All Sections to be Completed as necessary)*

Tissue Taken

| | | | |
|---|---|---|---|
| Tissue Taken - Date | | Cat 3 Risk Case | Yes / No |
| Name of Deceased | | DoB | |
| Mortuary Admission Number | | Visiting Pathologist Address / Tel No. If required | |
| Coroner | | | |
| Pathologist | | | |
| Received from (sig) | | Request Forms | Yes / No |
| Received by (APT sig) | | | |

Transfer from Mortuary to Path Lab – Tissue / Blocks & Slides

| Date | What Transferred (All or specify) | Establishment Transferred to | Transferred by (APT Sig.) | Print Name | Transferred to (Lab Tech/ Pathologist/Police Officer Sig.) | Print Name |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Return Transfer from Path Lab to Mortuary - Tissue / Blocks & Slides

| Date | What Transferred (All or specify) | Establishment Returned from | Transferred by (Lab Tech/ Pathologist Sig.) | Print Name | Transferred to (AP Tech Sig.) | Print Name |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

FORM 2 NOTED & FILED - APT Signature

Comments

Last updated 9.08.11 (2 sided document – details of specimens overleaf) Version 1

The Medico-Legal Centre Histopathology Request Form

Case Details

AFFIX MORTUARY ID LABEL

Name:

DoB: PM No.:

Date of autopsy:

Pathologist:

Coroner: CPD/Other

BIOSOURCE Label

Police Evidence Bag:

SIO:

CATEGORY 3 RISK?

POSILOCK No:

History/Autopsy findings of note:

Samples (Indicate the number of blocks of each tissue type)

No. of BLOCKS: (For routine histology)

Heart ☐ Lungs ☐ Liver ☐ Kidney ☐

Brain ☐ Muscle ☐ Spleen ☐ Pancreas ☐

OTHER (Specify):

SPECIAL REQUESTS:

| Date | Block(s) | Request(s) |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Dispatch from and Return to the Mortuary (To be completed by APTs and Laboratory)

| | Print Name | Signature | Date | Time |
|---|---|---|---|---|
| MLC Dispatch (APT1): | | | | |
| MLC Check (APT2): | | | | |
| Laboratory received | | | | |
| Laboratory dispatch | | | | |
| MLC Receipt (APT1): | | | | |
| MLC Check (APT2): | | | | |
| MLC Dispatch (APT1): | | | | |
| MLC Check (APT2): | | | | |
| Laboratory received | | | | |
| Laboratory dispatch | | | | |
| MLC Receipt (APT1): | | | | |
| MLC Check (APT2): | | | | |

Tissue Disposal Date: APT Name & Signature:

Version 1.3 Date 19.02.2013

**Fig. 1.34** The paperwork also includes 'cause of death' documents, histology tissue sheets (i.e., the record of tissues sampled), microbiology specimen forms, toxicology sample documents, and other items

**Fig. 1.35** After the examination, bodies are reconstituted and returned to the shelving in the fridges. Those with significant tissue degradation and decomposition may require heavy bagging ('cracker-wrapping') to avoid tissue leakage. Contaminated waste materials should be placed into clearly marked bags for incineration

## Suggested Reading

Connolly AJ, Finkbeiner WE, Ursell PC, Davis RL, editors. Autopsy pathology: a manual and atlas. 3rd ed. Philadelphia, PA: Elsevier; 2016.

Health and Safety Executive. Managing infection risks when handling the deceased (HSG 283). Jul 2018.

Hoffman PN, Healing TD. Guide to infection control in the healthcare setting. The infection hazards of human cadavers. International Society for Infectious Diseases; 2022.

Knight B. The post-mortem technician's handbook: a manual of mortuary practice. Oxford: Blackwell Scientific Publications; 1984.

Leadbeatter S, Lucas S, Lowe J. Standards for Coroners' pathologists in post-mortem examinations of deaths that appear not to be suspicious. The Royal College of Pathologists; 2014.

Ludwig J. Handbook of autopsy practice. 3rd ed. Ottawa: Humana Press; 2002.

Royal Institute of Public Health & Hygiene. A handbook of mortuary practice and safety for anatomical pathology technicians. 1991.

Saukko P, Knight B, editors. Knight's forensic pathology. 4th ed. Boca Raton: CRC Press; 2015.

The Royal College of Pathologists. Autopsy guidelines series by multiple authors. A rolling 5-year programme. https://www.rcpath.org/profession/guidelines/autopsy-guidelines-series.html.

# External Examination

2

Kirsty L. Lloyd and S. Kim Suvarna

## Introduction

The aim of the external examination is to identify the deceased, and to formally document relevant positive and negative findings related to natural disease or injury. The examination of the outer surfaces of a body provides supporting information for later clinicopathological correlation, and it may (in its own right) help to determine the cause of death.

The 2006 report from the National Confidential Enquiry into Patient Outcome and Death (a national review of the UK autopsy system) [1] states 'Before evisceration of a body, the pathologist must inspect the body first. This is to confirm identity, to observe any external features that might modify the process of examination and to consider the possible need for a forensic examination.' Guidance from The Royal College of Pathologists [2] also emphasises that this is a vital part of the autopsy.

The images in this chapter are organised in the manner of one starting with initial impressions and then going around the body at the start of an autopsy examination, finishing with changes seen with decomposition:

- Initial impression (Figs. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, and 2.12)

**Fig. 2.1** It is important to take a moment for an 'end of the bed assessment' at the beginning of the external examination. In this case, obese body habitus was linked to poor mobility and the finding of deep vein thrombosis and pulmonary embolism

**Fig. 2.2** The general state of nutrition can be assessed by looking at the abdomen. This patient is emaciated (cachectic). Note the green skin discoloration, which is an early sign of decomposition

S. Kim Suvarna was deceased at the time of publication.

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S. K. Suvarna (represented by Grace Horne), A. K. Sharp (eds.), *Atlas of Adult Autopsy*,
https://doi.org/10.1007/978-3-031-72207-3_2

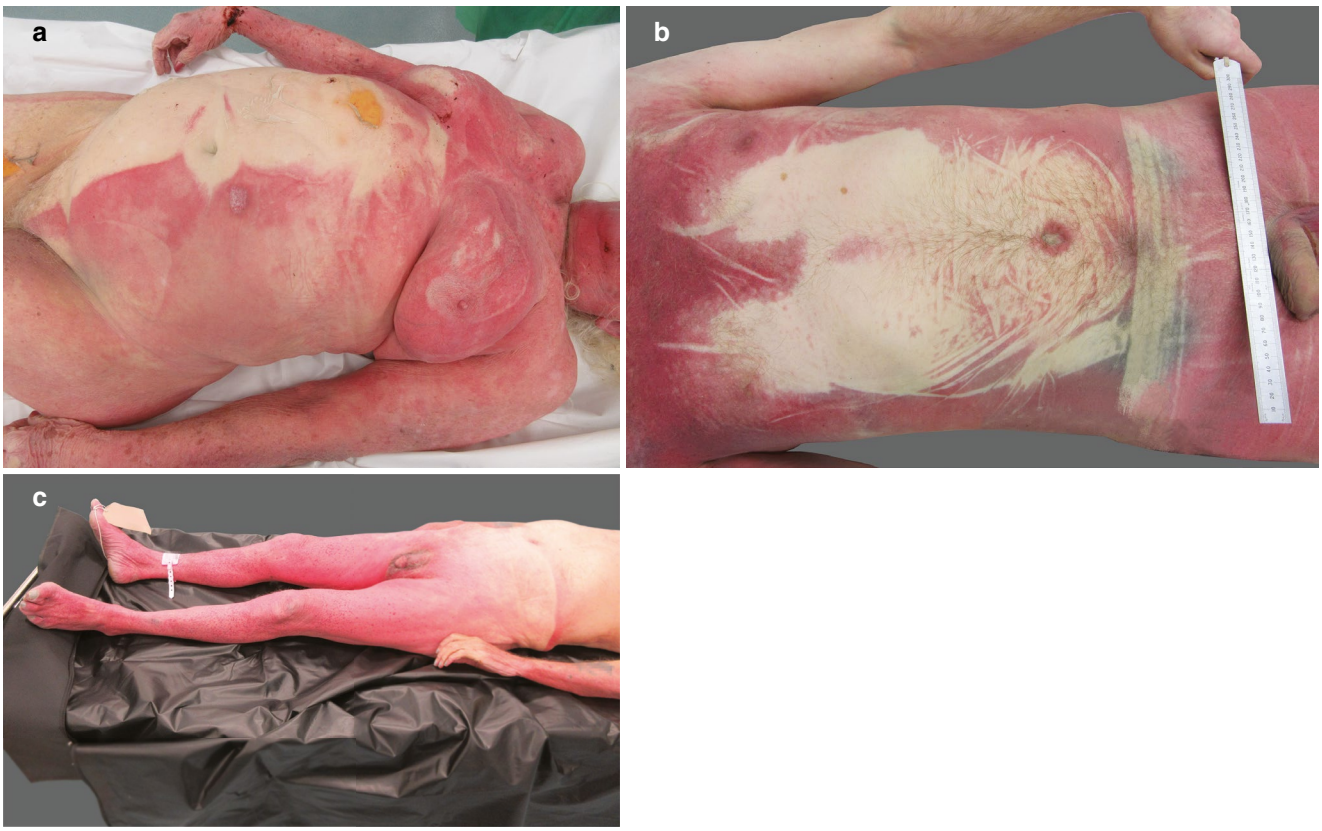


**Fig. 2.3** The distribution of hypostasis and lividity can provide information as to the position a person was in when they died. (**a**) In the first image, the spared, pale, area reflects this woman lying on something on her lateral side leaving a 'negative' imprint. Note also the parchment-like area of skin on the upper abdomen which represents a postmortem abrasion, with absence of vital reaction in the tissues. (**b**) The second image shows irregular imprints from clothing/fabric. The waistband of his trousers is readily identifiable. (**c**) The third photograph illustrated pronounced inferiorly distributed lividity over the abdomen and legs in a hanging case where the body was suspended above the ground

**Fig. 2.4** Jaundice is an indicator of hepatobiliary and pancreatic disease. It may be seen in people with decompensated alcoholic liver disease. Jaundice can be challenging to notice in the skin, unless very pronounced, as in this case. Yellow discolouration of the sclera would also be present

**Fig. 2.5** Fluids and material noted around or in the body's natural orifices are useful indicators of internal disease. The dark red/brown material from the mouth represents upper gastrointestinal haemorrhage. Note the accompanying jaundice in the skin. The cause of death was decompensated liver disease with acute upper gastrointestinal haemorrhage