The Royal College of Pathologists
Pathology: the science behind the cure

Guidelines on autopsy practice:

The decomposing cadaver

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NICE has accredited the process used by The Royal College of Pathologists to produce its autopsy guidelines. Accreditation is valid for 5 years from 25 July 2017. More information on accreditation can be viewed at www.nice.org.uk/accreditation.

For full details on our accreditation visit: www.nice.org.uk/accreditation.

Foreword

The autopsy guidelines published by The Royal College of Pathologists (RCPath) should enable pathologists to deal with non-forensic consented and medico-legally authorised post-mortems in a consistent manner and to a high standard. The guidelines are systematically developed statements to assist the decisions of practitioners and are based on the best available evidence at the time the document was prepared. Given that much autopsy work is single observer and one-time only in reality, it has to be recognised that there is no reviewable standard that is mandated beyond that of the FRCPath part 2 exam or the Certificate of Higher Autopsy Training (CHAT). Nevertheless, much of this can be reviewed against ante-mortem imaging and/or other data. This guideline has been developed to cover most common circumstances. However, we recognise that guidelines cannot anticipate every pathological specimen type and clinical scenario. Occasional variation from the practice recommended in this guideline may therefore be required to report a specimen in a way that maximises benefit to pathologists, the Coroner/Procurator Fiscal and the deceased's family. Pathologists should be able to justify/explain any deviation from the guideline.

There is a general requirement from the General Medical Council (GMC) to have continuing professional development (CPD) in all practice areas and this will naturally encompass autopsy practice. Those wishing to develop expertise/specialise in autopsy pathology are encouraged to seek appropriate educational opportunities and participate in a relevant external quality assurance (EQA) scheme.

The guidelines themselves constitute the tools for implementation and dissemination of good practice.

The following stakeholders were contacted to consult on this document:

- Forensic Pathology Specialist Group of the Forensic Science Regulator
- Human Tissue Authority.

In addition to a previous version of this guideline, a systematic search of PubMed was undertaken to supplement the information within this guideline. Key terms searched included decomposed, decomposing, post-mortem, necropsy, and autopsy between January 2015 and December 2022. However, much of the content of the document represents custom and practice and is substantially based upon clinical experience. Published evidence was evaluated using modified SIGN guidance (see Appendix A). Consensus of evidence in the guideline was achieved by review, with College members providing feedback during consultation. The sections of this autopsy guideline that indicate compliance with each of the AGREE II standards are indicated in Appendix B. Gaps in the evidence will be identified by College members via feedback received during consultation

No major organisational changes or cost implications have been identified that would hinder the implementation of these guidelines.

A formal revision process for all guidelines takes place on a five-year cycle. The College will ask the authors of the guideline to consider whether or not the guideline needs to be revised. A full consultation process will be undertaken if major revisions are required. If minor revisions or changes are required, a short note of the proposed changes will be placed on the College website for two weeks for members' attention. If members do not object to the changes, the short notice of change will be incorporated into the guideline and the full revised version (incorporating the changes) will replace the existing version on the College website.

The guideline has been reviewed by the Professional Guidelines team, Death Investigation Committee, Human Tissue Authority, Specialty Advisory Committee, and Lay Advisory Group. It was placed on the College website for consultation with the membership from 28 February to 28 March. All comments received from the membership were addressed by the author to the satisfaction of the Clinical Lead for Guideline Review.

This guideline was developed without external funding to the writing group. The College requires the authors of guidelines to provide a list of potential conflicts of interest; these are monitored by the Professional Guidelines team and are available on request. The authors of this document have declared that there are no conflicts of interest.

1 Introduction

These guidelines have been compiled to provide advice to autopsy pathologists who may be required to perform examinations on bodies demonstrating a variety of changes through decomposition, including putrefaction, mummification and skeletonisation. Animal predation (be it vertebrate or invertebrate) might also alter the remains. By the nature of the circumstances, such examinations will generally be instructed by the Coroner, Procurator Fiscal, or similar legal authority.

1.1 Target users and health benefits of this guideline

The target primary users of this guideline are consultant histopathologists who undertake routine Coronial and Procurator Fiscal post-mortem examinations.

The recommendations will also be of value to trainees preparing for the Certificate of Higher Autopsy Training (CHAT) and the FRCPath Part 2 or the Diploma in Forensic Pathology.

2 The role of the autopsy

The investigation should focus on the need to assist with the duties of the instructing body, in particular the identification of the deceased and the recognition of the cause of death. When a formal identity has not taken place prior to the autopsy, the pathologist should be informed of any putative identification, such that examination for any identifying marks (such as scars, piercings, tattoos, and implanted devices bearing unique serial numbers) be performed at that time. In addition, the pathologist should review their past medical history for any recognisable associated pathology. A significant delay in performing the autopsy while awaiting identification should be avoided to prevent the loss of further pathological and toxicological evidence; the process of decomposition continues even with adequate refrigeration of the body, particularly when there is larval activity present, such that re-examination at a later date when further information may be available might be less informative.

As with any request to perform an autopsy, sufficient information should be provided to inform the pathologist as to the circumstances in which the remains were found and to allow them to be satisfied that the case is suitable for a ‘non-forensic’ autopsy. Scene photographs are often taken during the initial police investigation by the Crime Scene Investigator, or increasingly from body worn police cameras, but are rarely available to the pathologist within the timeframe provided for a standard post mortem. If possible, viewing such imaging, preferably before agreeing to perform an autopsy, is often a good way to provide reassurance that the proposed plan for the post-mortem examination is appropriate. The College supports viewing such as imaging and recognises the benefits in contacting investigating officers for such purposes; effective communication through the office of the Coroner or Procurator Fiscal can expedite such collaborative working.

Pathologists may be instructed to examine repatriated bodies. Such cases may show varying states of decomposition that might be dependent upon access to, and the quality of, embalming in the originating country. The health risks posed by formalin fumes should be considered in such cases and the pathologist should make themselves aware of the potential artefacts created through embalming techniques.[1]

It should be recognised that an autopsy on a decomposing body is challenging on a number of levels and requires sufficient professional time and mortuary staff support to properly address the issues arising from the death.

3 Pathology encountered at the autopsy

The external and internal findings vary depending on whether the main process of decomposition process is putrefaction ('wet' decomposition) or mummification ('dry' decomposition). Not uncommonly, both main decomposition types are present to a variable extent in the same body. The processes are heat and time dependent and are also influenced not only by the environment in which the body has been resting following the death,[2] but also the degree of access to the remains by animals, as well as factors specific to the deceased such as pre-existing disease and body habitus. As such, accurately estimating the post-mortem interval is very problematic.[3]

When putrefaction predominates, there is a progression of changes including green/black skin discolouration, gas formation in the tissues (especially around the eyes, face and genitalia), venous marbling, fluid-filled bullae formation and skin slippage, along with bloating and purging of red-black liquid from the nose and mouth. Finger and toenails, along with the skin of the palms of the hand and the soles of the feet often detach.

Blowflies typically deposit their eggs over mucous membranes (eyes, ears, nostrils, mouth and anogenital regions). Subsequent initial maggot activity leads to soft tissue loss in the same regions, creating variably sized skin defects that generally lack associated internal bleeding. Any unusual distribution of larvae activity should raise concerns for oviposition within open wounds.

Internally, prominent autolytic changes in the organs rapidly develop making pathological assessment increasingly difficult. Greasy putrefactive fluid collections in the abdominal and chest cavities are very common and may be bloodstained; care should be taken to not mis-diagnose these as antemortem fluid collections such as ascites, pleural effusions or a haemothorax.

Mummification is characterised by desiccation of the tissues, often commencing in the face, fingertips and toes. The skin and any open injuries are usually well preserved, allowing for a good assessment to be made. Mould formation is common, whereas blowfly activity is not typical. Instead, other invertebrates such as beetles may be associated with the remains, particularly as the post-mortem interval increases. Such activity can result in 'shredded' tissues and open defects, progressing with the extent of skeletonisation. When mummification predominates, the internal organs are often well-preserved.

Post-mortem animal scavenging can lead to soft tissue defects, bone loss and skeletal element dispersal. This would include those dying within a domestic setting.

Adipocere is considered to occur when fatty tissues saponify, resulting in crumbling white waxy material, and is typically seen in bodies recovered from wet environments.

All these processes are well-described in the literature and standard texts.[1,4,5]

The degree to which decomposition affects identification of natural disease processes will vary, depending on the case. However, recognition of a cause of death is still possible in a significant number of cases.[5–8]

4 Specific health and safety aspects

Care should be taken when handling blades in the presence of putrifying tissues, as they may become slippery.

If there is any suggestion in the history of blood-borne viruses, high-risk behaviours or tuberculosis, then the autopsy is best considered 'high-risk' and the appropriate precautions should be taken. Post-mortem imaging might also provide a means of recognition of occult tuberculosis. Further information regarding safe working and the prevention of infection in the mortuary and post-mortem room can be found at www.hs.gov.uk.

[Level of evidence – GPP.]

5 Clinical information relevant to the autopsy

- A complete and appropriate collateral history of events surrounding the death (as is practicable) is integral to the investigation and a prerequisite to undertaking the post mortem.
- Police documentation confirming that the death is considered non-suspicious. Even with such documentation, the pathologist must remain vigilant for, and document where appropriate, the presence or absence of suspicious findings.
- Ideally access to relevant and past medical history details, recent operation records, drug therapy and radiology; however, it is recognised that some of the information may not be readily available in cases in which there is advanced decomposition.

6 The autopsy procedure

The usefulness of post-mortem imaging as an adjunct to standard invasive autopsy examination has been well documented, having both advantages and disadvantages, though is particularly applicable to cases involving decomposition.[9] Options for the type of imaging modalities utilised (e.g. plain x-ray, fluoroscopy or CT scanning) depends upon local availability and access. The results may assist with formal identification (particularly when the dentition is imaged) as well as allowing recognition of natural and unnatural pathology. Included within the latter would be the presence of skeletal trauma and foreign bodies, such as bullets.

The approach to the autopsy will depend to a large extent on the condition of the remains, but a systematic and careful examination is required in all cases to optimise the documentation of relevant findings.

The common practice of undertaking the autopsy with the deceased remaining in the body bag is not recommended, as to do so would limit the ability to clean and inspect the body surfaces effectively.

Examination and documentation of any clothing and personal effects is often useful. This may assist with the identification process and allows the comparison of soft tissue defects on the body against any overlying material damage (for example, identifying whether damage is due to a stab wound or post-mortem animal activity).

Articles being worn, such as clothing or jewellery, can become tightly apposed to the skin as bloating develops and leave potentially concerning linear marks particularly on the neck. Metal, such as silver, might tarnish and leave discolouration to the skin. These findings are assessed more easily before such items are removed.

A careful examination of the external aspects of the body should be undertaken prior to and following cleaning of the remaining skin to remove putrefactive materials and stains, focusing on the documentation of identifying features and potential injuries. This should include the lips and mouth mucosa, the skin of the neck and any remaining scalp. Tattoos may become more visible once epidermal layers are wiped away.

Discolouration often results from leeching of haemoglobin-derived pigments into the soft tissues from adjacent blood vessels: care should be taken not to confuse this with bruising and incision into the discoloured area may be performed to confirm haemorrhage

In cases where there is extensive loss of soft tissue from the anterior neck, an early attempt to recover the laryngeal structures for subsequent examination is recommended. This can prevent post-mortem damage to these key structures during handling and dissection, particularly if the tissues are desiccated and brittle.

In some cases, the preservation of the organs will allow a thorough internal assessment, while in others, usually with partial or advancing skeletonisation, no organs may be present. Post-mortem rupture of the stomach (gastromalacia) is recognisable by the conspicuous absence of a peritoneal reaction.

It is important to note that the finding of blackened skin and soft tissue loss with haemorrhagic putrefactive soft tissue changes (particularly in the neck, face and scalp) make it difficult to differentiate from ante-mortem bruising. Particular attention should be paid to the bony skeleton and laryngeal structures to identify whether ante-mortem trauma is evident. This can also be compared against any post-mortem radiological imaging.

The internal examination should include an assessment of the rib cage, spine, pelvis, skull vault and base (after stripping out of the dura), along with the laryngeal cartilages and the hyoid bone. A methodical approach to the examination of the anterior neck structures can be adapted to the condition of the remains, allowing both the hyoid bone and the superior horns of the thyroid cartilage to be carefully exposed and gently palpated to identify or exclude fracture(s).

When bloating and facial discolouration are present exposure of the bones of the lower face can be relatively easily achieved to exclude fractures. This involves extending a ‘Y’ neck skin incision and dissection over the lower third of the face; under tension, the skin can be reflected from below by careful dissection along the line of the mandible and medially from both sides, by firstly incising through the external ear canals at the level of the skull and then by soft tissue dissection over the zygomas. Once the lateral aspects of the mouth mucosa are incised, then the integrity of the soft tissue over the maxilla can also be readily assessed. Dissection performed in such a manner may also be readily reconstructed upon conclusion of the examination.

When advanced skin mummification is present, any dissection approach becomes more challenging (and sometimes not possible). However, reflection of the mummified scalp from the skull vault can be difficult to achieve in practice, though should always be first attempted.

In cases of advanced skeletonisation, careful examination of the bones for ante-mortem trauma becomes even more important. The bones should be briefly washed, which facilitates re-inspection; to optimise this process, a small number of regional mortuaries have bone washing facilities.

It is advised that anthropological advice/support be sought if estimation of height, age and sex from the skeleton is required. Such expertise should also be considered when there is dispersal of the bones at the scene of discovery, potentially by predation, or where the possibility of co-mingling of remains exists. It is likely that in such circumstances, a forensic autopsy may well be prudent.

[Level of evidence – D.]

7 Specific organ systems

The importance of examining the laryngeal structures and the bony skeleton has been highlighted above.

As thorough an examination as feasible should be undertaken on all the remaining organs present (including the stomach). The authors have experienced a number of decomposed cases (usually with mummification present) where hypothermic-type erosions are remarkably well-preserved within the gastric mucosa. Post-mortem discolouration of the intestinal mucosa should not be misdiagnosed as infarction.

Examining the brain in situ, after the calvarium is opened and prior to the softened and liquefying brain being removed, is often the best opportunity to observe the presence or absence of major intracranial pathology.

Calcification within coronary vessels can still be recognised, both through invasive autopsy and post-mortem imaging, though its presence in the latter does not accurately predict a cardiac cause of death.[10] The arteries may be dissected free and fixed, before being de-calcified and assessed through serial sectioning. Post-mortem CT with angiography may provide additional information.[9]

[Level of evidence – GPP.]

8 Organ retention

Retention of organs is not often necessary given the state of preservation which commonly exists. However, if injuries are identified to the larynx and skeleton, retention in fixative may be useful, pending further investigations. Such material may be decalcified and processed for histological examination.

Although readily prone to the effects of decomposition, neuropathological examination can still provide useful information.[11]

[Level of evidence – GPP.]

9 Recommended blocks for histopathological examination

Unless the organs show very advanced autolysis then histological sampling can still be valuable in identifying relevant pathology such as pneumonia, pancreatitis, cirrhosis, meningitis and myocardial fibrosis. Sampling of organs should be undertaken in the usual way. The use of connective tissue stains can facilitate the assessment. Immunohistochemistry has been shown to be beneficial on brain tissue with decomposition changes present,[11] and it is recognised that mummified tissues can retain the microscopic appearances of important pathology such as bruising for prolonged periods of time.[12]

[Level of evidence – D.]

10 Other samples and investigations

In most cases, toxicological sampling is recommended, but the value of the analysis will depend on the specimens available. While blood and urine are clearly optimal, these may well

not be present and other samples such as putrefactive fluid from the body cavity,[13] liver tissue, skeletal muscle, bile, stomach contents (and hair) can provide useful qualitative evidence of drug use, even if quantification is not always possible. Discussing the potential sampling options with your toxicology service provider is advisable.

Interpretation of the results should recognise the effect that post-mortem redistribution and decomposition can have on drug concentrations,[14] as well as the potential for the creation of compounds, such as alcohols and gamma hydroxybutyrate.

Samples for DNA extraction should be taken if requested by the investigating authority to facilitate identification; liver, spleen, heart, skeletal muscle, teeth and bone are among the possible samples. Prior discussion with the genetics laboratory is recommended to ensure appropriate sampling and storage.

Taking samples for entomological assessment, in the view of the authors, falls outside the usual requirement for the post-mortem investigation of decomposing bodies suitable for a 'non-forensic' autopsy. There may be rare instances when this is still appropriate and liaison with the entomologist who would be undertaking the work is then recommended.

Forensic odontology will often be used to formally identify the deceased and may be performed through post-mortem CT imaging. If physical examination of the dentition is required, the lower facial tissues can be reflected and the muscles of mastication divided, removing the need for facial incisions to access the jaws.

[Level of evidence – D.]

11 Clinicopathological summary

The commentary should incorporate the known circumstances of the death, the post-mortem examination findings and the results of the further investigations performed. It is important to highlight the extent of the difficulties arising from the degree of decomposition and your level of confidence in reaching your conclusions.

Noting what positive findings have been identified, in addition to the significant negative findings (particularly with reference to ante-mortem injuries), should assist the investigating authority determine, on the balance of possibilities, whether the death was likely the result of a natural disease process or a drug toxicity, or whether there is insufficient evidence to reach a conclusion. In such circumstances, the cause of death is best offered as 'unascertained'.[6,7]

[Level of evidence – GPP.]

12 Examples of cause of death opinions/statements

On the balance of probabilities, the cause of death is offered as:

Ia) Unascertained (decomposed)

Ia) Unascertained (skeletalised)

Ia) Mixed drug toxicity

Ia) Ischaemic heart disease.

13 Criteria for audit

The following standards are suggested criteria that might be used in periodic reviews to ensure a post mortem report for coronial autopsies conducted at an institution comply with the national recommendations provided by the 2006 NCEPOD study.

- Supporting documentations:
  - standards: 95% of supporting documentation was available at the time of the autopsy
  - standards: 95% of autopsy reports documented are satisfactory, good or excellent.
- Reporting external examination:
  - standards: 100% of the autopsy report must explain the description of external appearance
  - standards: 100% of autopsy reports documented are satisfactory, good or excellent.
- Reporting internal examination:
  - standards: 100% of the autopsy report must explain the description of internal appearance
  - standards: 100% of autopsy reports documented are satisfactory, good or excellent.

A template for coronial autopsy audit can be found on the RCPath website.

14 References

1. Rutty GN. Post-mortem Changes and Artefacts. *In*: Rutty GN (ed). *Essentials of Autopsy Practice, Volume 1*. London, UK: Springer, 2001.

2. Zhou C, Byard RW. Factors and processes causing accelerated decomposition in human cadavers – An overview. *J Forensic Leg Med* 2011;18:6–9.

3. Madea B. *Estimation of the Time Since Death (3rd edition).* Boca Raton, USA: CRC Press, 2016.

4. Saukko P, Knight B. *Knight's Forensic Pathology (4th edition).* Boca Raton, USA: CRC Press, 2016.

5. Burton JL. The Decomposed Body and Unascertained Autopsy. *In:* Burton JL, Rutty GN (eds). *The Hospital Autopsy – A Manual of Fundamental Autopsy Practice (3rd Edition).* London, UK: Hodder Arnold, 2010.

6. Ambade VN, Keoliya AN, Deokar RB, Dixit PG. Decomposed bodies – Still an unrewarding autopsy? *J Forensic Leg Med* 2011;18:101–106.

7. Byard RW, Farrell E, Simpson E. Diagnostic yield and characteristic features in a series of decomposed bodies subject to coronial autopsy. *Forensic Sci Med Path* 2008;4:9–14.

8. Maujean G, Vacher P, Bagur J, Guinet T, Malicier D. Forensic autopsy of human decomposed bodies as a valuable tool for prevention – A French regional study. *Am J Forensic Med Pathol* 2016;37:270–274.

9. Magnin V, Grabherr S, Michaud K. The Lausanne forensic pathology approach to post-mortem imaging for natural and non-natural deaths. *Diagn Histopathol* 2020;26:350–357.

10. Robinson C, Deshpande A, Rutty G, Morgan B. Post-mortem CT: is coronary angiography required in the presence of a high coronary artery calcium score? *Clin Radiol* 2019;74:926–932.

11. MacKenzie JM. Examining the decomposed brain. *Am J Forensic Med Pathol* 2014;35:265–270.

12. Wills SM, Johnson CP. Homicidal smothering: vital histological confirmation of orofacial injury despite a prolonged post-mortem interval. *Forensic Sci Med Path* 2009;5:28–31.

13. Drummer OH. Postmortem toxicology of drugs of abuse. *Forensic Sci Int* 2004;142:101–113.

14. Dinis-Oliveira RJ, Carvalho F, Duarte JA, Remião F, Marques A, Santos A, *et al.* Collection of biological samples in forensic toxicology. *Toxicol Mech Method* 2010;20:363–414.

Appendix A Summary table – explanation of grades of evidence

(modified from Palmer K *et al. BMJ* 2008;337:1832)

Grade (level) of evidence	Nature of evidence
Grade A	At least one high-quality meta-analysis, systematic review of randomised controlled trials or a randomised controlled trial with a very low risk of bias and directly attributable to the target population or A body of evidence demonstrating consistency of results and comprising mainly well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias, directly applicable to the target population.
Grade B	A body of evidence demonstrating consistency of results and comprising mainly high-quality systematic reviews of case-control or cohort studies and high-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relation is causal and which are directly applicable to the target population or Extrapolation evidence from studies described in A.
Grade C	A body of evidence demonstrating consistency of results and including well-conducted case-control or cohort studies and high-quality case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relation is causal and which are directly applicable to the target population or Extrapolation evidence from studies described in B.
Grade D	Non-analytic studies such as case reports, case series or expert opinion or Extrapolation evidence from studies described in C.
Good practice point (GPP)	Recommended best practice based on the clinical experience of the authors of the writing group

Appendix B AGREE II compliance monitoring sheet

The guidelines of The Royal College of Pathologists comply with the AGREE II standards for good quality clinical guidelines. The sections of this guideline that indicate compliance with each of the AGREE II standards are indicated in the table below.

AGREE II standard	Section of guideline
Scope and purpose	
1 The overall objectives of the guideline are specifically described	Foreword
2 The health questions covered by the guideline are specifically described	Foreword, 1
3 The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described	Foreword, 1
Stakeholder involvement	
4 The guideline development group includes individuals from all the relevant professional groups	Foreword
5 The views and preferences of the target population (patients, public, etc.) have been sought	Foreword
6 The target users of the guideline are clearly defined	1
Rigour of development	
7 Systematic methods were used to search for evidence	Foreword
8 The criteria for selecting the evidence are clearly described	Foreword
9 The strengths and limitations of the body of evidence are clearly described	Foreword
10 The methods for formulating the recommendations are clearly described	Foreword
11 The health benefits, side effects and risks have been considered in formulating the recommendations	n/a
12 There is an explicit link between the recommendations and the supporting evidence	4–11
13 The guideline has been externally reviewed by experts prior to its publication	Foreword
14 A procedure for updating the guideline is provided	Foreword
Clarity of presentation	
15 The recommendations are specific and unambiguous	2–12
16 The different options for management of the condition or health issue are clearly presented	2–12
17 Key recommendations are easily identifiable	2–12
Applicability	
18 The guideline describes facilitators and barriers to its application	Foreword
19 The guideline provides advice and/or tools on how the recommendations can be put into practice	Foreword
20 The potential resource implications of applying the recommendations have been considered	Foreword
21 The guideline presents monitoring and/or auditing criteria	13
Editorial independence	
22 The views of the funding body have not influenced the content of the guideline	Foreword
23 Competing interest of guideline development group members have been recorded and addressed	Foreword