

# GUIDELINES FOR POST MORTEM REPORTS

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## INTRODUCTION

The post mortem report clearly should inform the clinician, coroner, general practitioner and pathologist. The format must be flexible and widely comprehensible. The extensive use of information technology must be anticipated.

The Royal College of Pathologists emphasises that a single standard should be applicable to all post mortem examinations, whether funded by the National Health Service, Coroner, or Procurator's Fiscal. The major difference between these types is in the frequency of histological examination. Recent publications indicate the desirability of retention of tissues for histological examination in most cases. The extent to which Coroners will support and finance this is limited, but the principle is clear.

A post mortem report will normally include:

1. Demographic details
2. History
3. External examination
4. Internal examination
5. Histology report
6. Summary of findings
7. Commentary/conclusions
8. Cause of Death (OPCS format)

## GENERAL COMMENTS

It is envisaged that these guidelines should serve for all hospital, Coroner's and Fiscal post mortems other than Home Office cases. The report should be typewritten on a form of adequate size. Pre-printed single page forms impose excessive brevity. A summary of findings, or parts 1-4 should be sent out within 48 hours. Any conclusions and cause of death at this stage are tentative and may be modified. The histological findings, commentary/conclusions and cause of death should be sent out as soon as possible, *ie* within two to three weeks. (*Neuropathology will require 4-6 weeks for completion*). The final document should contain all the material issued initially since experience shows that isolated supplementary reports are easily lost.

# POST MORTEM REPORT

## 1. Demographic Details

Hospital number/Mortuary sequential number

Name, forenames, title

Family or maiden name

Home address

Name of GP and/or hospital consultant

Sex, age/date of birth

Next of kin, person giving permission for post mortem

Source of the patient, or hospital and ward details

Details of those individuals to whom the report should be sent:

**Normally**

Coroner/Fiscal

General Practitioner

Hospital Consultant

*(In Coroner's and Fiscal cases it is highly desirable that the report should be sent to the general practitioner and hospital consultant, though the decision on issue and timing of reports will depend on hearings, inquests, and on the Coroner's or Fiscal's policy).*

**Optional**

Anaesthetists

Radiotherapists and other professional groups

Audit and other Confidential Enquiries *(see Appendices 3 and 4)*

Persons present at post mortem, as appropriate:

Pathologist(s)

Post mortem attendants

Medical staff

Police and other observers

Dates, times and place:

Date and time and place of death

Date and time and place of post mortem

Date of preliminary report

Date of final report

Authority for post mortem (hospital, Coroner, Fiscal)

Identification of body (hospital tag, or name of person making identification)

Type of post mortem:

Complete

Partial, with exclusions

Fetal/neonatal/sudden infant death *(see Appendix 1)*

Neuropathological *(see Appendix 2)*

Maternal deaths *(see Appendix 3)*

Pathologists must be alerted to any potential hazards eg Hepatitis B, HIV or the possibility of Creutzfeldt-Jakob disease. *[Reference: Safety in Health Service Laboratories: (a) Safe Working and the Prevention of Infection in Clinical Laboratories (ISBN 0-11-885446-1), (b) Safe Working and the Prevention of Infection in the Mortuary and Post Mortem Room (ISBN 0-11-885448-8), (c) Safe Working and the Prevention of Infection in Clinical Laboratories; Model Rules for Staff and Visitors (ISBN 0-11-885442-9). These publications are available from Her Majesty's Stationery Office]*

## 2. History

- (a) History of present illness in chronological order, and circumstances of death. It is the pathologist's responsibility to be satisfied that a full account has been obtained. The history should be an integral part of the report, reference to notes or letters is not an adequate substitute
- (b) The past history often explains the findings. Absence or difficulty in obtaining this information should be recorded
- (c) Clinical and laboratory investigations should be quoted where relevant

Radiology and photography before post mortem should be considered.

### 3. External description

Weight in kilograms (Imperial weights are now largely obsolete)

Height in centimetres

External appearances, sex, age, build, nutrition, colour, racial pigmentation, lividity and rigour

Measurements of significant surface features, scars, operation sites, bruises *etc* with a clear description of the site including diagrams/photography

Infant/neonatal/fetal deaths require additional measurements, studies of dysmorphism, placental studies, and x-ray (*see Appendix 1*)

### 4. Internal examination

The examination must be described in a uniform and clear manner. Each organ system should be described in turn. The order of recording the examination is not mandatory but will usually be:

Cardio-vascular system

Pulmonary system and pleural cavity

Gastro-intestinal system (including liver and peritoneum)

Genito-urinary system

Endocrine system

Locomotor system (*see Appendix 2 for cases of muscular and nerve disorders*)

Bone marrow, spleen and lymph nodes

Brain (*see Appendix 2 for preliminary inspection of brain and spinal cord in neuropathological cases*)

- (a) The central nervous system should be examined in all cases
- (b) The weight of the heart, lungs, brain, liver and kidneys should be taken in all cases
- (c) The weights of spleen, adrenal, thyroid, parathyroids, ovaries and testes are desirable in appropriate cases
- (d) Describe positive findings, and list all normal organs to avoid later uncertainty

- (e) Special examinations such as marrow, vertebral slice, examination of inner ear, vertebral arteries, *etc* depending on the clinical context

- (f) Examination of sites of fractures and recent operation, preferably with clinician present

### 5. Histology report and other investigations

- (a) Indicate whether material has been taken for histology

- (b) Indicate what other material has been saved, *ie* toxicology, microbiology, *etc*

- (c) Record tissues sent to any third party for further investigation, such as genetic analysis, tissue culture, *etc*

(*Infant/neonatal/fetal histology and special investigations in Appendix 1*)

### 6. Summary of findings

A list of the major pathological lesions present. It is desirable to code these for future retrieval, *eg* SNOP, SNOMED, Read Codes.

### 7. Commentary/Conclusions

- (a) A commentary should be written in the light of all the information available; the length will be determined by the complexity of the case

- (b) Reconcile as far as possible the major clinical problems with the pathological findings

- (c) Indicate new pathological lesions and explain how these illuminate the clinical observations

- (d) Present any inconsistencies in the findings and suggest any steps to be taken, such as further opinions, audit meetings, *etc*

## 8. Cause of death

The cause of death must be given in the standard form required by the OPCS (Office of Population, Censuses and Surveys). Discussion with the responsible clinicians should avoid discrepancies or indicate points of disagreement.

## COMMUNICATION

Failure of information to reach its intended recipient is the greatest cause of misunderstanding between pathologists and those they serve.

- (a) Ensure that the report is typewritten to a high standard
- (b) Check that all sections (*ie* 1 – 8 above) are present
- (c) Audit the time taken for reports to be issued and delivered.

## APPENDICES

### Appendix 1 MINIMUM GUIDELINES FOR POST MORTEM INVESTIGATION OF LATE FETAL, PERINATAL AND NEONATAL DEATHS (FROM 20 WEEK 0 DAYS GESTATION TO 1 MONTH OF AGE)

**Note:** *It is recognised that pathologists will need to use their clinical judgement and conduct investigations appropriate to individual case histories. This list contains investigations probably indicated in ALL cases. Other investigations that may be indicated are listed at the end.*

#### **Audit**

Date of death and date of post mortem; date of report; local code number and identifiers

#### **Bacteriology**

Blood sample (particularly if consent not obtained for full post mortem)

#### **External Examination**

##### **Measurements**

Body weight (electronic scale)  
Head circumference  
CH and CR length  
Foot length

##### **Dysmorphism**

Photographs and additional x-rays if abnormality present

##### **Placenta**

To be examined in all cases (implies making arrangements for placentae from babies admitted to Special Care Baby Units to be stored for 1 month after birth). A convenient method may be to send placentae from Special Care Baby Unit/Neonatal Intensive Care Unit admissions to the pathology department. Whilst these need not be

examined unless the baby dies, many departments would, in any case, consider it good practice to examine them.

**Whole body x-ray:** If available

#### **Internal Examination**

Inspection of cranial, thoracic and abdominal cavities

Weight of all major organs (digital balance)

Systematic description of skull, ribs and major organs including brain, heart, upper airways, lungs, thymus, liver, intestines, kidneys, bladder, adrenals, pancreas and gonads, noting whether other organs normal or abnormal

#### **Histology**

Paraffin section: at least one block of major organs, especially lung, kidney, liver, placenta and membranes. (Needle biopsies of lung and liver if consent to full post mortem not obtained)

#### **Other Investigations**

As indicated from history or type of delivery; eg for twins, blood group analysis. Detailed placental examination would be advisable.

### **MINIMUM GUIDELINES FOR POST MORTEM INVESTIGATION IN POST NEONATAL INFANT DEATHS OR SUDDEN UNEXPECTED DEATHS IN INFANCY**

#### **Audit**

Date of death and date of post mortem; date of report; local code number and identifiers

#### **Bacteriology**

Blood and CSF

#### **External Examination**

##### **Measurements**

Weight, CR, CH, OFC, foot length

##### **Dysmorphism**

Photographs and x-ray screening if abnormality present

##### **Hypostatic staining**

##### **Evidence of injury**

(X-ray if present)

#### **Internal Examination**

Inspection of cranial, thoracic and abdominal cavities

Weight of all major organs on digital balance

Systemic description of skull, ribs and major organs including brain, heart, upper airways, lungs, thymus, liver, intestines, kidneys, bladder, adrenals, pancreas and gonads, noting whether other organs normal or abnormal

#### **Histology**

**Paraffin section:** at least one block of:

epiglottis and larynx;

trachea (including thyroid);

4 lobes of lung;

heart (posterior LV and RV wall, IV septum);

thymus;

duodenum (including head of pancreas);

ileum;

liver (left triangle, right square);

spleen;

mesenteric lymph node;

adrenal gland;

kidney;

costochondral junction of right 6th rib; muscle (diaphragm and pectoralis major)

## Neuropathology

4-6 blocks, including cerebral hemisphere, brain stem, cerebellum and meninges. (Consider submitting brain for formal neuropathology)

Additional investigations that may be indicated:

- (a) Virology (postnasal swabs or aspirate, lung, CSF, ileal content)
- (b) Samples of skin or pericardium for fibroblast culture (tissue and method as advised by local laboratory)
- (c) Biochemistry (vitreous fluid, urine)
- (d) Immunology, toxicology and genetic investigations: (eg storage of pericardium for tissue culture and spleen for future DNA studies)
- (e) Frozen section of liver and kidney for fat stain.

## Appendix 2 NEUROPATHOLOGY

The following is a summary of the main points which should be noted in post mortems involving neurological, neuro-surgical and psychiatric deaths. Further details are given in the full guidelines prepared by the Neuropathology Sub-committee of the Royal College of Pathologists, and available from the College.

Pathologists should consider whether cases need referral to Regional Centres of Neuropathology. Disorders of skeletal muscle and peripheral nerve disorders may require complex histochemistry of snap frozen tissues and electron microscopy.

- (a) Surgeons or interventional radiologists should be invited to observe or participate in dissection
- (b) Pathologists should be particularly alert for potential hazards such as Hepatitis B, HIV or Creutzfeldt-Jakob disease

### External Examination

CSF should be taken before starting

### Histology

Additional organs may include the pituitary, sensory and autonomic ganglia, middle ear, and orbital contents

### Dissection of the Neck

Major extracranial carotid vertebral arteries should be removed *en bloc* from the mastoid process to the level of the upper sternum. Vertebral arteries should be examined *in situ*, or as part of *en bloc* removal of the cervical spine.

### Examination of Skull and Brain

- (a) Careful examination of scalp for haemorrhage or bruising
- (b) Care should be taken not to induce fractures during removal of the calvaria. A rough estimate of thickness should be made.
- (c) Special techniques may be needed for examination of the posterior fossa or upper spinal cord, cutting a wedge from the occiput combined with laminectomy

- (d) Hydrocephalus may require *in situ* examination with removal of the upper vertebral column and sectioning through the facial bones. Careful reconstruction is essential if a satisfactory cosmetic result is to be obtained.

The neonatal brain is extremely soft requiring great care and, sometimes, immersion in saline for atraumatic removal.

#### **Preliminary Inspection of the Brain**

- (a) The brain should not be sliced before fixation. Careful macroscopic examination will often provide information for a preliminary cause of death.
- (b) Fresh samples should be taken for microbiology, virology, or neurochemistry as needed. Direct smears or aspiration cytology may assist tumour diagnosis.
- (c) Dissection of arteries prior to fixation is recommended in the identification of aneurysms.
- (d) Suspension of the brain in 10% formol saline for 3-4 weeks is recommended with weekly changes of fixative. The spinal cord should be suspended vertically.

#### **Dissection**

- (a) While coronal sectioning of the cerebral hemispheres is traditional, midline sagittal or horizontal planes may help correlation with CT scan or magnetic resonance images
- (b) Routine blocks should normally include dura, frontal, temporal, parietal, occipital, basal ganglia, thalamic nuclei, hippocampi, mamillary bodies, corpus callosum, cerebral white matter, and cerebellum (including dentate nucleus, pons, medulla mid-brain and brain-stem). In cases in which the pathology is limited to a particular part of the brain histological sampling may be more restricted.

## **Appendix 3 MATERNAL DEATHS**

### **Definitions**

Deaths occurring during pregnancy or within 42 days of childbirth are classified as maternal deaths and should be notified to the UK Confidential Enquiry into Maternal Deaths. Those resulting from obstetric complications of pregnancy, labour and the puerperium are termed 'direct' maternal deaths, whereas those due to disease which pre-dated, or occurred during pregnancy, but which was aggravated by the pregnancy, are termed 'indirect'. 'Fortuitous' deaths are due to causes not related to, or influenced by pregnancy. The Enquiry is also interested in 'late' deaths, occurring up to one year following delivery, although these are not at present formally included in the statistics of maternal mortality.

### **Notification**

Notification will normally be initiated by the clinicians concerned, but pathologists will sometimes encounter cases which were not under the formal care of an obstetrician, or in which death has occurred after the patient has left direct clinical supervision. In such cases, the pathologist should ensure that the formalities of notification to the Enquiry are completed. Each Region has a Pathology Assessor for Maternal Deaths who can be consulted whenever necessary. The Royal College of Pathologists maintains a list of Assessors. Regional Directors of Public Health will advise on the procedures for notification.

### **Conduct of post mortem**

In relative terms, maternal deaths are now so few that individual pathologists may have little personal experience of the problems involved. For example, in the three years from 1985 to 1987, only 265 maternal deaths were reported to the Enquiry. The proper conduct of a maternal post mortem calls as much for routine good pathological practice as for special expertise, but an awareness of certain common obstetric problems is essential. Pathologists involved in such a case should refer to the review article on the maternal post mortem by Rushton and Dawson in the *Journal of Clinical Pathology*, volume 35,

909-921 (1982) which summarises the areas requiring special attention. The assistance of an obstetric pathologist, neuropathologist or other specialist should be requested whenever appropriate.

### **Surgical specimens**

The pathologist undertaking a maternal post mortem should also examine or review any recent surgical resection specimen, such as a caesarian or post-partum hysterectomy. The post mortem report should cross refer to the surgical specimen, with particular reference to the context of the post mortem findings.

### **Reports of the Confidential Enquiries**

Pathologists are recommended to consult the reports of the Confidential Enquiries into Maternal Deaths for the last 4 triennia which contain chapters devoted specifically to the maternal post mortem. These reports have found it necessary to draw attention to certain shortcomings in maternal post mortem practice which are regarded as constituting substandard care; in particular, the omission of a histological report, or of other necessary laboratory investigations. The Confidential Enquiry is concerned not simply to establish a basic cause of death, but to reach as full an understanding as possible of all the circumstances surrounding the death. A detailed post mortem is invaluable in these assessments.

### **Clinicians and Coroners**

The pathologist should consult fully with all clinicians who were involved in the obstetric and anaesthetic care of the deceased so that all relevant issues are properly addressed at the post mortem. The pathologist should personally ensure that the clinicians are given notice of the time and place of the post mortem, that a copy of the full report reaches them personally on its completion and that this is also supplied to the Confidential Enquiry. Since many maternal post mortems are carried out on the instructions of the Coroner, the pathologist may on occasion have to press the Coroner's office to facilitate such communication. In framing the report to the Coroner the pathologist should not be deterred from writing a full report on a maternal death on account of the limitations of a Coroner's post

mortem pro-forma. If the Coroner declines to order a post mortem in a case of maternal death, all possible steps should be taken to obtain a hospital post mortem to assist the Confidential Enquiry in its assessment of the case.

## **Appendix 4 NCEPOD – National Confidential Enquiry into Perioperative Deaths**

NCEPOD is an independent body supported by Colleges and Associations including the Royal College of Surgeons of England, the Royal College of Anaesthetists, the Royal College of Pathologists, and the Associations of the Surgeons and Anaesthetists. The management of NCEPOD is undertaken by three clinical coordinators; there is a Steering Committee on which the Royal College of Pathologists is represented.

NCEPOD was founded in 1988 following a Regional Pilot Study. The Study undertaken in 1989 concentrated on paediatric surgery. All available post mortem reports were examined by Dr J Keeling (1). In 1990 a random sample of perioperative deaths other than those in children were examined. The post mortem reports were examined by a panel of nine pathologists (2,3). The 1991-92 report (to be published September 1993) examines selected operations.

Post mortem examination is an important form of audit in perioperative deaths. The majority are performed under the Coroner's authority. Surgeons are aware of the value of the post mortem but need to be informed of the findings as soon as possible in a clear format which addresses their clinical problems. While improvements in presentation, completeness of description, histological examination, and commentary are all desirable, the most immediate impact could be achieved by ensuring that the results of hospital and forensic post mortems are made available to clinicians.

### **REFERENCES**

1. Campling EA, Devlin HB, Lunn JN. The Report of the National Confidential Enquiry into Perioperative Deaths 1989. pp 104-107.
2. Campling EA, Devlin HB, Hoile RW, Lunn JN. The Report of the National Enquiry into Perioperative Deaths 1990 pp 344-352.
3. Morley AR. The Bulletin of the Royal College of Pathologists 1992; 79:9.