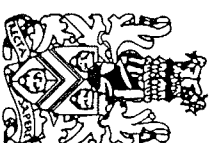


**GUIDELINES FOR POST-MORTEM AND  
RETENTION OF ORGANS AND TISSUES  
IN SINGAPORE**



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**Academy of Medicine, Singapore**  
142 Neil Road, Runme Shaw Building, Singapore 088871

## I. INTRODUCTION

1. Issues regarding retention of organs and tissues following autopsy have recently been the subjects of much concern for practicing pathologists. The legality and the ethics of such retentions were questioned extensively in the United Kingdom during inquiries involving the Bristol Royal Infirmary and the Royal Liverpool Children's (Alder Hey Children's Hospital) Inquiry.
2. Between 1999 and 2001, the Royal College of Pathologists, United Kingdom and the Royal Australasian College of Pathologists have reviewed their practice procedures regarding retention of tissue following post-mortems. In view of this, the Chapter of Pathologists thought it prudent to review the practice in Singapore and to recommend practice guidelines for pathologists involved in non-coronial post-mortems.
3. The medical community has the responsibility of keeping faith with patients who consult them. They should not break this trust. Similarly with pathologists, this trust extends to the handling and reporting of tissue samples or organs, whether these tissues or organs be from surgical procedures or autopsies.
4. To address this issue, the Chapter set up a subcommittee comprising two members from the main Chapter Committee, both practising histopathologists, and 3 pathologists from other practices with autopsy services. The members of the subcommittee thus formed are :  
Dr Angela Chong, Chairperson, Chapter of Pathologists  
Dr Inese Busmanis, Committee Member, Chapter of Pathologists  
Dr Chong Siew Meng, National University of Singapore  
Dr Paul Chui, Health Sciences Authority  
Dr Sim Chee Seng, Changi General Hospital, SingHealth

## II. ROLE OF AUTOPSY

1. The importance of an autopsy or post-mortem examination cannot be denied. Since the early development of medical science, autopsy has revealed much in the way of disease processes and is a much undervalued means of investigation. It is also an audit of clinical practice.
2. Reference is made to the Royal College of Pathologists report on Autopsy and Audit, c 1991, where it is stated that "In a study of 100 intensive care deaths, 10% of autopsies revealed findings, which if detected before death would have led to a change of management".

3. Autopsies in Singapore fall under two categories - coronial and non-coronial. The coronial autopsies are required by law and come under the Criminal Procedure Code. Non-coronial autopsies are performed on request and serve to investigate or confirm the nature and extent of disease leading to death of the patient.

### III. CURRENT PRACTICE

1. Non-coronial autopsies: In Singapore these are performed by hospital or private pathologists and include adult, paediatric and perinatal deaths.
2. Number : The actual number of non-coronial autopsies is small. The large majority of non-coronial post-mortems are perinatal post-mortems, a practice which is directly influenced by the social and cultural practices of Singapore's ethnic Chinese population where the remains of stillbirths and perinatal deaths are traditionally not claimed.
3. Authorisation : Authorisation or consent is usually obtained from the next of kin. This duty usually falls to the requesting physician. Where the body is unclaimed, the law (under Medical Therapy, Education and Research Act) provides for the mechanism to allow post-mortem examinations to be carried out without consent from next of kin.
4. Extent of Examination : A post-mortem examination entails external and internal examination of the body. An internal examination entails removal of organs from the body cavity for examination and includes histologic assessment of relevant tissue samples suspected of showing disease. This provides a better understanding of the disease process or the underlying abnormality. Organs and tissues not retained are returned into the body cavity before release of the body for burial or cremation.
5. Tissue Samples : Diagnostic tissue samples are first taken as wet tissue (tissue which is placed in a fixative such as formalin), processed into wax blocks and sectioned for microscopic examination. Excess wet tissue is subsequently disposed of in accordance with the laboratory's usual procedures, through licensed biological waste contractors.
6. Archival tissue : Whole organs or parts of organs which contain specific diagnostic or unusual changes related to disease, other pathologic conditions or developmental malformations, may be retained and archived for use as examples in teaching or research.

7. Report : Following post-mortem, the pathologist will issue a report of his findings to the attending and/or requesting physician. The physician may wish to release a copy of this report to the next of kin or other physicians involved in the management of the deceased.

8. Cause of Death Certificate : The attending pathologist will issue the Cause of Death Certificate after performing the post-mortem (*\*cf. Section XI para 3*). In the case of a limited post-mortem, if the cause of death cannot be determined within the limits imposed on the pathologist, the attending physician should issue the certificate.

### IV. EXTENT OF POST-MORTEMS (FULL VS LIMITED)

1. Questions are occasionally raised as to the extent of post-mortems. It is preferable that any post-mortem that is conducted should be a full post-mortem. This entails external and internal examination of the body and its organs including brain.
2. The extent of tissue sampling, and its importance should be clearly stated and explained. This information is standard and could be made available in a handbook. This would obviate exhaustive lists appearing on the consent/authorisation form.
3. A limited post-mortem is sometimes requested whereby only a specific organ or a few specified organ systems are examined. The benefits of the full examination should be explained to the relatives before consideration of a limited post-mortem as this may prove inconclusive. This point has to be made clear to both requesting clinician and next of kin.
4. For limited post-mortems, the committee advises that there be clear written indication of which systems are to be examined and what methodology is to be employed. The pathologist should ensure that the post-mortem examination stays within the specified limits.
5. If in the course of the post-mortem it becomes apparent that additional tissue, parts of organs, or whole organs not previously specified need be retained for further diagnostic work up, the relatives or family members should be notified prior to release of the body for burial. There is no legal basis for mandatory retention in a non-coronial procedure.
6. The committee strongly advises against usage of general terms such as 'partial post-mortem' without further clarification.

## V. RETENTION OF ORGANS

1. Retention of organs and tissues is a contentious issue. There is great educational value in retained tissue samples and organs. In the past, retention without consent was the accepted 'traditional' practice but the increasing demand for transparency in professional procedures warrant a change in this practice.
2. In the March 2000 issue of Guidelines for Retention of Tissues and Organs at Post-Mortem Examination, the Royal College of Pathologists, United Kingdom states clearly that retention of tissue *must be defensible, open and justifiable in law* and that this practice should be *professionally regulated to high ethical standards*. The committee subscribes to this view.
3. Small samples of tissue taken for histologic diagnosis are part of the patient's records. The committee is of the opinion that these tissues, which are stored as wax blocks and slides should be handled in the same manner as surgical diagnostic tissue and remain the property of the pathology department. Retention of the blocks and slides would then fall under the guidelines and procedures set in place for surgical accessions.
4. Whole organs may be removed for diagnostic purposes. This may be because of special fixation requirements, as in the case of the brain and spinal cord or other reasons. In these cases, there should be documentation that there is no objection from the family, and that they understand that these organs will not be available for burial with the body.
5. For bodies which are not claimed for more than 24 hours after death, provision is given in MTERA for the DMS (Director Medical Services) to authorise in writing, the use of the body or any specified part for the purposes of medical or dental education, research therapy or transplantation. The department involved is advised to obtain this documentation as part of its standard operating procedures.
6. If retention of tissue or organs is sought for purposes of research rather than diagnosis or education, the committee for this research programme should have prior clearance from a properly constituted Ethics Committee within that institution. For research protocols, the committee advises that the duration of retention of human material be specified.

## VI. ARCHIVAL SPECIMENS

1. Collections of archived tissue and organs exist in Singapore. These may come from autopsy or from surgical resections and are used for teaching and education of medical and dental students. Occasionally, loan of these specimens are sought by various authorities for purposes of display at public health exhibitions.
2. The committee feels that such collections should be under the care of a public institution, be it a hospital or a university. These specimens should never be considered, or be allowed to form part of an individual's personal collection.
3. Administrative boards and the senior officers of these institutions should be aware that these collections exist within their domain and that the maintenance of these collections fall within their responsibility. There should be written guidelines addressing purpose and use of the collection, conditions of storage, display and ultimate disposal of the collection or individual specimens within that collection. A responsible and trained senior person should also be named as curator of this collection.
4. Archived organs are rightly used for education and teaching of students of medicine and related disciplines. However noble the intention, the committee feels that public display of the organs should be discouraged. Graphic representation could serve the public health education purposes equally well.
5. A census of current holdings is recommended. This would then form a baseline indication of where these specimens are currently housed and in what numbers. This census should include minimum data such as numbers and types of specimens. If possible, diagnosis (i.e. reason for retention) and year of collection should be included.
6. Future additions to these holdings should be carefully documented and open for audit if and when required.

## VII. PERIOD OF RETENTION

1. Archived museum specimens are often kept in perpetuity. Should there be a change in status, these should be disposed of in the proper manner according to the guidelines of that institution. The committee recommends those conditions of storage and disposal be made known to the family at the point of collection.

2. The issue of diagnostic samples stored as waxed blocks and glass slides has been addressed in *Section V paragraph 3*. The committee recommends that these be governed by the same guidelines and procedures as applies to surgical tissue.
3. In the case of wet tissue, the committee recommends that these be retained for a period of 3 months from the date of issuance of the post-mortem report. Reports should be available not more than 3 months from the date of post-mortem examination. This gives allowance for prolonged fixation and investigation techniques.
4. Wet tissue thus retained should be disposed of in the appropriate manner according to the department's written guidelines. The mode of disposal should be made clear to the estate of the deceased.
5. There may be occasion when relatives/estate of the deceased request for tissue or organs to be returned to them for delayed burial. The committee recommends that where possible, the wishes of the bereaved family should be accommodated. The tissue should preferably be delivered to a licensed undertaker of the family's choice as the lay public should not be expected to handle wet tissue or organs in its original form.
6. The committee considered obtaining an opinion from the main religious groups regarding delayed burial of body parts, but in view of the diversity of groups, this was not done. The committee advises that this is an issue that should be discussed on a case by case basis, at the time of consent and the agreed outcome documented for future reference.

## VIII. AUTHORISATION FOR POST-MORTEM

### CONSENT FOR POST-MORTEM

1. In Singapore, according to the Medical (Therapy, Education and Research) Act, post-mortems can be authorised in the following manner :
  - a) Any person over the age of 18 may authorise a post-mortem examination of his body, either in writing or orally in the presence of two witnesses for the purpose of establishing or confirming the cause of death or of investigating the existence of abnormal conditions. This authority is effective upon the death of that person.

- b) The next of kin, in absence of actual notice of contrary indications by the deceased person or the opposition by another member of the same class or prior class as specified in the Schedule, may authorise a post-mortem examination of the deceased person.

- c) In the case of bodies unclaimed for more than 24 hours after death, the Director of Medical Services may authorise in writing the post-mortem examination of the body for the purpose of establishing or confirming the cause of death or of investigation the existence of abnormal conditions.
2. The person who obtains consent for post-mortem examination should be fully versed with the purposes of the examination and procedures. The committee fully endorses the recommendation of the Royal College of Pathologists, UK (RCPath) that this person be a senior and properly trained doctor, preferably "the consultant who knew the relatives best during the patient's last illness".

3. The pathologist should not be involved in the taking of consent or authorisation for a post-mortem as issues regarding conflict of interest may arise.

4. The committee recommends that each hospital should designate a professionally trained person to communicate with the family. This person may be medically qualified or be a member of the nursing or allied health profession. The responsibility of adequacy of training and competence lies with the hospital concerned.

5. The committee is cognizant of the sample authorisation/consent form from the College of American Pathologists, which includes the statement "I understand that it is standard procedure in this hospital to remove certain organs and tissues and retain them for education, research and potential future therapies".

6. The committee is of the opinion that post-mortem consent forms in Singapore should include a similar statement in particular regarding retention of tissue samples for diagnostic, educational and research purposes. The actual details could be addressed in an accompanying information booklet.

7. In the case of whole organs retained for archival purposes, the committee feels that specific consent for archival purposes should be obtained. In non-coronial post-mortems, there is no medico-legal basis for retention, other than for diagnostic purposes, thus there should be distinction

- between the status of retained diagnostic tissue and retained archival organs.
8. Authorisation forms should be written in a language easily understood by lay public. The post-mortem procedures, the subsequent examination and retention of tissue should match the expectations and perceptions of what the relatives or family of the deceased have agreed to. A copy of the consent and what was agreed upon could be given to the family for retention and future reference.

#### **IX. CERTIFICATE OF CAUSE OF DEATH (CCOD)**

1. The law requires a medical practitioner to sign and deliver a death certificate within 12 hours of the death due to natural causes of any patient he has attended to.
2. In the case of a non-coronial post-mortem, pathologists have been mindful of a circular from Dr Kwa Soon Bee (*Circular ProfNo 14/75, ORGFH 20:05, Standing Order on Death Certification, Coroner's Cases and Authorisation for Use of Unclaimed Bodies*) stating that "when an autopsy is performed with the consent of the relatives, the pathologist will issue the death certificate". **This has been superseded by Professional Circular 6/2002 dated 7 May 2002.**
3. The law requires deaths where the cause of death is not known to be made Coroner's cases. For non-coronial cases, the attending physician must certify that there is a cause of death and that the cause of death is natural. **Thus pathologists must ensure that for non-coronial post-mortems, a CCOD (Certificate of the Cause of Death, Form G, prescribed by the First Schedule to the Registration of Births and Deaths) must first be issued by the attending clinician.**
4. The Ministry of Health's Professional Circular 6/2002 has clarified that for a non-coronial autopsy, the doctor who performs the post-mortem is required by law to report his findings, and to issue a second CCOD if there is significant variance from the clinical CCOD. **This is a separate and distinct obligation from that of the doctor who certifies a cause of death before the post-mortem.**
5. This second CCOD should be issued to the next of kin in the usual manner, and a second copy should be forwarded to the Registry of Births and Deaths.

6. In the event that there is a difference in information provided to the Registry of Births and Deaths with respect to the cause of death as determined clinically and by post-mortem, the Registry will determine how these are to be reflected in their records. The RBD may decide to seek advice from a separate and independent medical expert. The AG has advised that this is a matter for the Registry of Births and Deaths to resolve.
7. **In this context, the Chapter strongly recommends that the autopsy report issued to the requesting clinician address whether the autopsy findings are consistent or not consistent with the stated clinical cause of death. The autopsy report must carry a statement on the cause of death as determined by autopsy. This must be similar to the cause of death as certified in the CCOD issued by the pathologist.**
8. Where the post-mortem discovers a cause of death which is unnatural, the physician should make the case a Coroner's case. The Centre for Forensic Medicine, Health Sciences Authority may be contacted for further advice.

#### **X. POST-MORTEM EXAMINATION OF STILLBIRTHS AND FETUSES**

1. Registration of stillbirths is required by law and these should be managed procedurally in the same manner as a neonatal death. It is useful to note that guidelines regarding the gestational age of stillbirths vary. In Singapore it is taken as 28 weeks (fetal weight approximately 1000g). Australia recommends 24 weeks (fetal weight approximately 600g) while some others recommend 20 weeks gestation as the cut off point.
2. The committee understands that at present, there is no legal provision for examination of fetuses and abortuses and no guidelines as to what should be considered autopsy and what should be considered as biopsy.
3. In these circumstances, provided legal guidelines regarding definition of still births and neonatal deaths are followed, the committee recommends that the actual demarcation between autopsy and biopsy for births of lower gestational age, should be resolved individually in each hospital's working procedures. These should be clearly documented.
4. The main difference in the practice of pathology regarding what is submitted as a biopsy and what is submitted as a request for post-mortem seems to lie in issues regarding consent and recommended formats of examination.

5. Generally, formats governing procedures in non-coronial autopsy, in particular regarding consent and mode of examination are more regulated and detailed. In addition, many perinatal autopsies are performed in specialised units with specific interests in pediatric pathology and in presence of the attending pediatrician.
6. In the case of biopsy specimens, consent is usually related to the fact that the surgical procedure is performed for diagnostic and/or therapeutic purposes. In the case of abortuses and fetuses the pathologist currently assumes that consent for examination is implied. Furthermore reporting parameters in surgical pathology regarding examination of abortuses and fetuses may not be as well defined as in autopsy pathology.
7. The Royal College of Pathologists' guidelines recommends that "for the examination of fetuses delivered dead, written parental agreement must be obtained regardless of gestational age". The committee supports this view, and would encourage all hospitals to incorporate into the authorisation for termination of pregnancy, a simple line to allow examination of the resulting abortus and placenta.
8. Retention of tissue in the case of surgical biopsies are well set out in all laboratories.
9. Retention of tissue and organs in pediatric and neonatal post-mortems should follow the same principles as set out for other post-mortems. If there is a possibility that whole organs are to be retained for diagnostic purposes (and not be available for burial with the body), these organs should be specified and made known to the parents.
10. Again, a simple booklet with relevant information would help in disseminating information. This booklet would have to contain information relevant to pediatric post-mortems.
11. Similarly if fetal tissue is required specifically for research, approval from the relevant Ethics Committee should be obtained. Parental consent should be obtained and this consent for fetal tissue research should be obtained separately from authorisation for termination of pregnancy, as these are two unrelated issues.
12. Tissue or organ collections from pediatric and neonatal post-mortems should be governed by the same guidelines as for any other archival organs (cf. section VI).

These collections should belong to institutions, not individuals and should have proper documentation.

13. **The issue peculiar to Singapore is the examination of fetuses and stillbirths, which are not claimed. In these cases, the Chapter has clarified with the Director Medical Services, Singapore that in accordance with MTERA, written permission from DMS is required before any procedure is commenced on unclaimed bodies. This power is not delegable to any other authority.**

14. Although examination of unclaimed bodies are provided for by law, the committee is of the opinion that parents should still be entitled to know if examination of the fetus or stillborn child will take place, if organs are to be removed, and the purpose of removal. This should be explained to the parents and an opt out clause in the notification of no claim is suggested.

15. **An alternative arrangement has been suggested in cases where fetuses are involved. The AG has noted that parents can make an anatomical gift of the fetus for the purposes of education, research and advancement of medical or dental science, therapy or transplantation, as provided for in section 7 of the MTERA. This section also states who can become donees of anatomical gifts. This section of MTERA is appended for reference.**

16. **Parents of the fetuses and abortuses may also authorise post-mortem examinations to be carried out (cf. MTERA, Part III Post-Mortem Examination). Again a trained staff member or counsellor and an information booklet would be of use in these situations.**

## **XI. RECOMMENDATIONS**

1. It must be restated that retention of tissue must be defensible, open and justifiable in law and that this practice should be *professionally* regulated to high ethical standards.

2. A census of all archival tissue collection in Singapore should be conducted. The details of this census should be made known to heads of departments and senior administration of institutions where these collections reside.

3. An information booklet regarding practice of post-mortem and its purpose should be readily available.

4. Consent should be documented for archival retention of whole organs.
5. A list of licensed undertakers should be made available to pathology departments so that retained tissue can be released to them for disposal, should relatives opt for delayed burial.

## **XII. REFERENCES**

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