

Chapter of Pathologists, Academy of Medicine, Singapore.,  
22/10/01

**Human Tissue for Biomedical Research**

**Introduction**

- 1.1 The global demand for use of human tissue in research is growing rapidly and this trend is reflected clearly in Singapore where current demand far outstrips availability. Ethical and legal issues however have yet to be fully addressed.
- 1.2 At the request of the Human Genetics Subcommittee, National Bioethics Advisory Committee, 'tissue' will refer to small tissue samples; however, the Chapter feels that ethical issues raised in this paper would also apply to all other types of human tissue, including samples of subcellular structures like DNA to cells, tissue samples (including bone, muscle, connective tissue and skin), blood, gametes, embryos, fetal tissue, placenta, body fluids and waste (including hair and nail clippings); as well as whole organs.

**2 Sources**

- 2.1 Human tissue for research may be obtained from living volunteers/ research subjects, who donate their tissue for a specific project.
- 2.2 Provision for anatomical gifts is covered under the Medical (Therapy, Education and Research) Act where it is stated that persons over the age of 18 may donate all or part of their body (the gift to take effect upon death) for any of the specific purposes and donees stated. (Approved institutions as notified by the Minister, or specified individual for therapy or transplant.)
- 2.3 Tissue samples (including blood and blood products, and body fluids) left over from diagnostic or therapeutic sampling may also be harvested or archived for research purposes. Currently this category forms the largest group of archived and banked tissue.
- 2.4 Noncoronial autopsies may also provide a source of tissue for research. This issue has been addressed in the Chapter's Interim Guidelines : Autopsy Practice in Singapore. A copy of this is appended for your information.
- 2.5 Human embryos, eggs and sperm are banked in Singapore. Ethical and legal considerations for this group are not covered in this paper as they are considerably more complex.

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

3 Consent

- 3.1 The Chapter is of the opinion that the patient should be informed, and where possible, consent should be taken if any tissue sample is to be used for purposes other than what it was originally removed for.
- 3.2 Validity of consent is well covered in law, and the principles behind recognition of persons authorised to give consent for treatment and operation should apply to donation of 'surplus' therapeutic or diagnostic tissue for research. In the case of tissue removed in an emergency procedure where the patient is not conscious, consent for/lack of objection to donation of tissue for research could be obtained from relatives or family members. In absence of these, the advice of the hospital's ethics review board and tissue review board should be obtained.
- 3.3 For healthy living volunteers, the Chapter feels that the legal age of consent for donation of tissue should follow what is specified in MTERA for donation of body parts; which is persons over the age of 18. Tissue from the mentally incompetent/incapacitated or from those below this age group should preferably not be taken, especially if harvesting of tissue requires any form of surgery or anaesthesia. In exceptional cases, if tissue harvest is contemplated, researchers should ensure that the procedure does not carry any adverse on the donor. Consent must also be obtained from the legal guardians, and approval of the ethics review board of the hospital or institution involved in the study documented.
- 3.4 Where donated tissue, or tissue removed prospectively from volunteers is concerned, the consent is for a particular, specified approved project. In these cases, the question would be whether the initial consent extends beyond the original project. It has been common practice to store collections of tissue (including blood, blood products and body fluids) on completion of the project, with a view to using these for future yet to be specified projects. The principal investigator may also 'share' samples with other researchers. The Chapter recommends that these issues be addressed in the original protocol and that patient consent for, or objection to, archival of specimens and further research (on completion of the original project) be documented. Any further research project (assuming consent is given), should be treated as a new proposal and be submitted for approval by the relevant authorities. (cf Section 7, Archived Tissue)
- 3.5 In the case of tissue removed for therapeutic or diagnostic purposes, the consent is usually for the surgical procedure with removal of tissue, for diagnostic or therapeutic purposes. Presently, the use of this tissue for research and other scientific purposes, though widespread, is not formally addressed.

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

- 3.6 The Royal College of Pathologists, UK, has recently issued transitional guidelines for handling of 'surplus' tissue arising from surgical procedures. Here the College recommends that 'generic' consent be taken from patients for use of surplus tissue for laboratory quality control and research work and that any research programme utilising this tissue would require the approval of an institutional ethics/ review board. The Chapter fully endorses this view.
- 3.7 The Chapter recommends that 'consent for operation' forms should include an option whereby the patient is able to indicate lack of objection to, or donation of, 'left over' or 'surplus' tissue for medical research. For instance, a consent form may include the following sentences:  
*'I understand that tissue is necessarily removed and will be submitted for analysis and diagnosis. I consent/do not consent to the donation of this tissue for research, teaching and other scientific purposes.'*
- 4 **Repositories and Storage**
- 4.1 **Storage :** Human tissue may be stored as fresh tissue without fixative, frozen tissue or processed tissue for instance as paraffin blocks or slides. This also applies to blood and blood products, and other tissue or cell samples.
- 4.2 **Repositories:** Tissue holdings exist in many hospitals, institutional and research laboratories in Singapore. The diagnostic laboratories hold tissue samples which have been used for diagnostic purposes and may hold donated or surplus tissue. Research laboratories may hold donated tissue, or surplus archived tissue.
- 4.3 **Diagnostic Pathology Departments :** All institutions and hospitals in Singapore with service laboratories hold tissue blocks and slides, and archived samples of body fluids, blood and blood products. A few may hold wet tissue. Generally these departmental holdings are probably the largest tissue archives in Singapore.
- 4.4 **Diagnostic Departments :** archive diagnostic tissue samples in accordance with current good clinical practice guidelines, the case files (in this case slides and blocks) can be reviewed and perhaps sent for expert opinion. The tissue is kept against the chance that there may be a medicolegal challenge regarding the diagnosis or the possibility that new prognostic and therapeutic markers may be developed, and used during the patient's lifetime. One such example is the use of Herceptin which requires evaluation of c erb B2 expression on the tumour cells. All service departments have standard procedures regarding documentation, minimum retention times, conditions of storage and use of tissue as well as cyclical laboratory audits.

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

- 4.5 **Research Departments** : Tissue, blood and blood product holdings in non diagnostic departments are not as well regulated, and is very much dependant on the individual researcher or principal investigator. Because of this dependance, these holdings/research banks are the source of some concern as guidelines for documentation, conditions of storage, Identification of biohazards, verification and use of the tissue held are not clearly given nor audited by any professional body.
- 4.6 **Research Collections** : The fate of collections kept by individual researchers under specific grants are influenced by mundane matters such as resignation or prolonged leave of the researcher/principal investigator or lack of funding of the research programme.
- 5 **Tissue Banks**
- 5.1 The concept of establishing tissue banks to encourage biomedical research is currently very much in vogue. The Chapter however is concerned at the haste in which such banks are being set up without proper audit and due accreditation of processes. A census of tissue banks/collections in Singapore, and details of their holdings is highly recommended. These should be made known to the hospital or host institution where these holdings reside.
- 5.2 All tissue banks must be properly audited and accredited. There should be a quality programme, on a national level, to ensure "good tissue practices". The Chapter would recommend and support the formation of an ad hoc committee involving regulators, professional bodies and the biomedical industry with a view to register, inspect and accredit tissue banks in Singapore.
- 5.3 All tissue collected need quality assurance control, verification of tissue type and screening for biological hazards. For this, a pathologist has to be involved. The Chapter strongly urges that all tissue banks must have a named accredited specialist pathologist in a supervisory and legally accountable role.
- 5.4 In the case of tissue collected purely for specific research projects, a finite end point and retention time for these specimens must be stated in the research protocol and the disposal of such tissue should be addressed. cf Section 3.4
- 5.5 Collection of surplus tissue should take place after examination of the tissue by the reporting pathologist. This is because the legal responsibility of reporting margins, adequacy and extent of resection falls on the pathologist. This is also an important tissue audit issue as the question of unnecessary surgery and excessive harvesting of tissue may arise, especially if the

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

surgeon/clinician performing the biopsy are involved in a study that utilises this tissue. Collection of fresh tissue can be facilitated if prior arrangements are made with the reporting pathologist.

- 5.6 If there is chance that these samples are to be archived after completion of the project and possibly used for subsequent projects, this intention must be stated at the time that tissue was harvested. Documentation should include conditions of storage and disposal, presence or absence of linkage to patient identity, and ethics committee approval for other future research projects. cf Section 3.4
- 5.7 **Central banking** has been mooted in several countries, but issues regarding intellectual ownership, patient consent and ultimate fate of harvested/stored tissue have arisen. This is well addressed in Livolsi's paper. Under the present circumstances, the Chapter does not support the idea of central banking. As all service departments are required to keep good documentation of the extent and type of holdings within their premises, the Chapter suggests that each individual institution be responsible for their own service holdings, but perhaps subscribe to some central data network where availability and location of tissue holdings are listed.
- 5.8 The tissue bank should also be able to audit end users of the human tissue samples supplied.
- 6 **Custodianship**
- 6.1 The Chapter is of the opinion that the legal owner of the tissue is the tissue donor himself/ herself.
- 6.2 **Diagnostic Service Departments** : act as stewards or guardians of the tissue on the patient's behalf. Tissue archives in these departments are part of the hospital's medical records. The Chapter's guidelines for ethical laboratory practice states in paragraph 6.5 that as stewards of the patient's tissue, 'the laboratory providing the primary diagnostic analysis is responsible for the maintenance and integrity of archival tissue', and that while researchers should not be prevented from using this tissue, the pathologist must ensure patient confidentiality and also that there is sufficient tissue left over for diagnostic review and for the possibility of subsequent prognostic work up.
- 6.3 The responsibility for upkeep, maintenance, use and audit of research collections should be the responsibility of the institution/hospital/research organisation where the original research collection was approved, or to which the tissue was donated. The institution should have proper documentation of tissue collections under its custody. Although the principal investigator may have immediate daily responsibility for the tissue, the host institution should be the formal custodian.

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

- 6.4 Tissue collections should not be allowed to be transferred between institutions or researchers without approval of the ethics and institutional boards. Collections of human tissue samples should not be regarded as the 'personal property' of any one individual investigator or team.
- 6.5 For diagnostic tissue, the service department has the right to refuse release of this tissue for research projects that have not been approved by the proper ethics/institutional review board, and which have not sufficiently met all the criteria as defined by that particular laboratory.
- 6.6 If paraffin blocks are removed from the service record files, there should be some arrangement for these to be traceable at all times, and for these to be returned to the original laboratory when the study is completed. The intellectual property and work of the pathologist/department in identifying the diagnostic tissue for these projects should be addressed satisfactorily in the study protocol.
- 6.7 'Surplus Tissue' : Custodianship of material left over from therapeutic or diagnostic procedures rightly lies with the laboratory where the initial diagnosis was made. The Chapter would emphasise that it is only after the pathologist has examined the tissue and the diagnosis made, that the remaining tissue can be considered 'surplus'. In principle, the Chapter feels that this tissue is best managed by the pathology department as this is the very nature of that department's functions. However this is an issue for each individual institution to resolve.
- 7 Research on Archived Tissue
- 7.1 The Chapter has received several submissions on the definition of 'research' and whether all research projects require ethics committee approval.
- 7.2 The Royal College of Pathologists UK, state that as long as the research proposal requires the performance of new or additional testing, this requires the approval of the ethics review board. However, if the 'research' proposal merely reviews and compares old slides and data on files, and has no adverse consequences to the patient, then the project can proceed with a minimum requirement that the review board is informed. The Chapter endorses these recommendations.
- 7.3 For genetic research, the Chapter supports the recommendations of the Medical Research Council, UK and the Advisory Committee on Genetic Testing - specifically regarding the necessity of consent for tests and that genetic testing should not be added onto an existing study without consent.

Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

**8 Patient Confidentiality**

- 8.1 **Tissue banks** providing samples to researchers should ensure patient confidentiality. Samples should be nonidentifiable/non linked/ anonymised where possible. In all these cases, however, the original tissue bank should have a comprehensive documentation and a good tissue tracking system.
- 8.2 Reference is made to the Chapter's Guidelines on Ethics of Laboratory Practice where patient confidentiality is addressed. Researchers do not have automatic right of access to patient records. This must be approved by Ethics Review Boards.
- 8.3 Researchers should consider if donors' of tissue samples/research participants wish to be informed of the results of the research project. This should be addressed in the research protocol. This is of particular importance in the case of genetic testing.
- 8.4 If, in the course of the project, a particular individual result reveals a finding of clinical and therapeutic importance, good clinical practice norms would require that there is a clear duty of care to inform the research participant via the clinician responsible for his or her care.

**9 Financial Consideration**

- 9.1 **Donation** of human tissue must be free. There should be no financial payment of the donor.
- 9.2 There should be no commercial exploitation of human tissue. The rights of the tissue donor with respect to potential patents and financial profit should be clearly addressed in the study protocol. Customarily, the tissue donor renounces these rights as the proportion of an individual tissue donor's contribution in a study may be impossible to quantify. This aspect however needs be explained and consent documented from the outset, especially if the purpose of the tissue collection is to establish a commercially viable product.
- 9.3 The laboratory providing the tissue banking service should be allowed to recover the costs of the service.

Chapter of Pathologists, Academy of Medicine, Singapore.,  
22/10/01

**Appendix**

Submissions were invited from HOD, Pathology in various restructured and private hospitals, and from the Chairman Chapter of Surgeons, Academy of Medicine Singapore.

Replies received as of 15<sup>th</sup> October are appended.

1. Dr Raymond Lin, KKH.
2. Prof Chong Siew Meng, NUS.
3. Dr Roger Quaife, Parkway Laboratories.
4. Dr Ivy Sng, Singapore General Hospital.
5. Dr Christopher Goh, Chairman, Chapter of Surgeons, Academy of Medicine, Singapore.
6. Interim Guidelines – Autopsy Practice.
7. Guidelines : Ethics of Laboratory Practice.



Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

## References

- 1 Human Tissue And Biological Samples For Use In Research. Operational And Ethical Guidelines. Medical Research Council, UK. [Http://Www.Mrc.Ac.Uk/Pdfs/Tissue%20Guidelines\\_Final.Pdf](http://www.Mrc.Ac.Uk/Pdfs/Tissue%20Guidelines_Final.Pdf).
- 2 A Code Of Practice For Tissue Banks : Providing Tissues Of Human Origin For Therapeutic Purposes. Department Of Health UK. [Http://Www.Doh.Gov.Uk/Humantissuebanking/](http://www.Doh.Gov.Uk/Humantissuebanking/)
- 3 Autopsy Practice In Singapore. Chapter Of Pathologists, Academy Of Medicine Singapore. October 2001-10-15.
- 4 CALGB Tissue Banking Policies. Ohio State University. [Http://www.Pathology.Med.Ohio-State.Edu/Calgb/](http://www.Pathology.Med.Ohio-State.Edu/Calgb/)  
Consensus Statement Of Recommended Policies For Uses Of Human Tissue In Research Education And Quality Control. Royal College Of Pathologists. 1999.
- 6 Eiseman E.,Haga SB. Handbook Of Human Tissue Resources : A National Resource Of Human Tissue Samples. RAND, 1999.
- 7 Grizzle WE Et Al. Providing Human Tissues For Research. Arch Pathol Lab Med.1998, 122 :1065-1076.
- 8 Guidelines : Ethics Of Laboratory Practice. Chapter Of Pathologists, Academy Of Medicine, Singapore. Nov 2000.
- 9 Informed Consent In Tissue Donation. Department Of Health And Human Services, USA. January 2001. [Http://Www.Hhs.Gov/Oig/New.Html](http://www.Hhs.Gov/Oig/New.Html)
- 10 Livolsi VA. Use Of Human Tissue Blocks For Research. Am J Clin Pathol 105 : 260-261, 1995
- 11 Opinion On The Establishment Of Collections Of Human Embryo Cells And Their Use For Therapeutic Or Scientific Purposes. CCNE. [Http://Www.Ccne-Ethique.Org/English/Avis/A\\_054.Htm](http://www.Ccne-Ethique.Org/English/Avis/A_054.Htm)
- 12 Opinion on a preliminary draft law incorporating transposition into the Code of intellectual property of a European Parliament and Council Directive. 98/44/CE dated July 6 1998, on the legal protection of biotechnological inventions. CCNE <http://www.ccne-ethique.org/english/pdf/avis064.pdf>

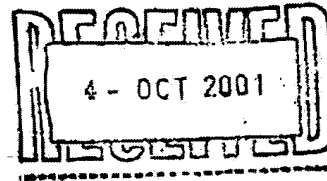
Chapter of Pathologists, Academy of Medicine, Singapore.  
22/10/01

- 13 Opinion and recommendations on Genetics and Medicine: from prediction to prevention. CCNE <http://www.ccne-ethique.org/english/pdf/avis064.pdf>
- 14 Opinion On The Establishment Of Collections Of Human Embryo Cells And Their Use For Therapeutic Or Scientific Purposes. CCNE. [Http://Www.Ccne-Ethique.Org/English/Avis/A\\_054.Htm](http://www.Ccne-Ethique.Org/English/Avis/A_054.Htm)
- 15 Oversight Of Tissue Banking. Department Of Health And Human Services. USA January 2001. <Http://Www.Hhs.Gov/Oig/New.Html>
- 16 Public Perceptions Of The Collection Of Human Biological Samples. Medical Research Council, UK. <Http://Www.Mrc.Ac.Uk/Pdfs/Biocollsumm.Pdf>
- 17 Retention And Use Of Human Tissue From The Living. A Review Of Current Rules And Guidelines. Royal College Of Pathologists Of Australasia. February 2001.
- 18 The Availability Of Human Tissue For Biomedical Research. The Report And Recommendations Of ECVAM Workshop 32. 1998.
- 19 The Establishment Of Human Research Tissue Banking In The UK And Several Western European Countries. The Report And Recommendations Of ECVAM Workshop 44. Sept 2000.
- 20 Transitional Guidelines To Facilitate Changes In Procedures For Handling 'Surplus' And Archival Material From Human Biological Samples. Royal College Of Pathologists. June 2001.



**KK WOMEN'S  
AND CHILDREN'S  
HOSPITAL**

02 October, 2001



Dr Angela Chong  
Chairperson  
Chapter of Pathologists, Academy of Medicine  
142 Neil Road  
Singapore 088871

Dear Dr Chong

**Tissue banking**

Thank you for your invitation to comment on the use of human tissue for research in relation to the position paper being prepared by the Human Genetics Subcommittee.

In the context of foetal tissue, it may be difficult to draw a distinction between tissue, organs and body parts. I should expect the same principles apply to all three categories.

Use of tissue for genetic research should follow the principles set out in the Good Clinical Practice guidelines governing research.

In principle, all research, genetic or otherwise, should be conducted only with the consent of the patient, particularly if the research project has been planned.

For tissues which are archived or stored for diagnostic purposes, but for which future unplanned research might pertain, it would be advisable to include an appropriate clause in the consent form that the residual or archived tissue might be used for research.

Notwithstanding the above consent if obtained, the use of such tissue for research should still be rigorously evaluated by an ethics committee to safeguard the interests of the patient.

In the context of genetic research, a specific consent where applicable is preferred to a general consent for "any genetic research".

Particular care has to be exercised where the objective of the genetic research is not relevant to the reason for which the tissue was obtained. For example, piece of breast tissue being investigated for possible breast cancer oncogenes is different from being investigated for schizophrenia genes.

In all cases, safeguarding the patient's anonymity and privacy is paramount.

Where genetic research results in the propagation of a cell line or in a patentable product derived from the genetic information of a particular individual, explicit consent of the patient or next-of-kin should be sought, or the issue should be brought to a high-level authoritative body for decision. In order for such consent to be obtained, traceability is required. Traceability will then need to be reconciled with the requirement for anonymity.

I have come across a research protocol where the consent is for such-and-such (specific purpose) and "further possible genetic research". This type of proposal and consent should be discouraged.

From the title I presume that the paper will address tissue banking for the express purpose of genetic research. In this case, two important mechanisms must be put in place: policies, rights and consent for tissue banking; consent for research as indicated above.

*Raymond Lin*  
Dr Raymond Lin  
Head, Laboratory

100  
BUKIT TIMAH ROAD  
SINGAPORE  
228899  
TELEPHONE  
65-293 4044  
FACSIMILE  
65-293 7933

I will concentrate only on an aspect which I feel has been insufficiently highlighted. This is the issue of informed consent for. It seems clear that informed consent is necessary when human tissues, or products thereof, are to be commercially exploited. There are several subtleties here though.

- 1) Commercial exploitation requires research and the patient would therefore have to consent to having his tissues researched upon. Insufficient attention, however, has been devoted to examining exactly what constitutes research. Applying a blanket rule that consent is required for 'research' without specifying exactly what constitutes research is likely to cause a complete halt to many research activities currently carried out in pathology departments. Traditionally, pathologists have analysed suitably anonymised tissues in different ways – histopathology deals essentially with morphological analysis while chemical pathologists are obviously involved in biochemical analysis. Does a patient need to consent to these, or other traditional forms, of research, that do not involve molecular genetic analysis? It would seem to me that the area of greatest public concern is genomic analysis and consent should certainly be required for that. Where, however, does one draw the line – would investigation of up- and down-regulation of genes in disease processes e.g. inflammatory conditions, constitute genomic analysis? In any case, it would be difficult to explain to patients that there are different forms of research.
- 2) If consent is not given, can a pathologist then study the features of the patient's disease in the diagnostic tissue sections or samples that have been subjected to genetic (or any other) analysis and publish those results as part of a suitably anonymised series? If one follows the letter of the law, it would appear that this is not possible.
- 3) How is consent to be obtained? A suggestion has been that the consent that a patient gives at time of biopsy be modified to include a statement that the patient does not object to having his tissues researched upon. This consent is kept in the patient's file and not made known to pathology departments. How are pathologists to know whether or not the patient has given consent for appropriate research (whatever that means)? It would be almost impossible for pathologists to keep track of individual consents and would greatly hamper retrospective analysis of tissues.
- 4) To complicate matters, no consent seems to be required for the drawing of blood or the collection of samples of other natural fluids for analysis.

A/Prof Chong Siew Ming  
Chief  
Department of Pathology  
National University Hospital

**Shanita**

---

**From:** "Roger Quaife" <Roger\_Quaife@gleneagles.com.sg>  
**To:** <main@academyofmedicine.edu.sg>  
**Cc:** "George Pusavat" <George\_Pusavat@gleneagles.com.sg>  
**Sent:** Tuesday, October 09, 2001 11:44 AM  
**Attach:** main1.html; index\_gn.html; Nuffield Council Recommendations.htm  
**Subject:** Human Tissue research

Dear Shanita,

Thankyou for asking for my opinion on this subject. I would tend to follow the recommendations of the Nuffield Council and have attached these for your information. In addition, the Clinical Molecular Genetics Society of the UK and the American based Association for Molecular Pathology have views that you may find appropriate. I hope this is of some help. Best Wishes - Roger Quaife.

(See attached file: main1.html)(See attached file: index\_gn.html)

(See attached file: Nuffield Council Recommendations.htm)

10/22/01



# Singapore General Hospital

Department of Pathology: Tel: 3214930/4931 Fax: 2276562

18 October 2001

Dr Angela Chong  
Chairperson  
Chapter of Pathologists 2001-2002  
Academy of Medicine  
142 Neil Road  
Singapore 088871

Dear Angela,

**Re: Tissue Banking**

I apologise for the delay in replying to your request for comments on the above subject. Thank you for sending me your preliminary submission on "Human Tissue for Biomedical Research" which I just received. I enclose my comments on the next sheet. Please keep me informed on the position paper.

With regards.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Ivy Sng'.

Dr Ivy Sng  
Head, Histopathology

SI/jn

## TISSUE BANKING

### 1. The Role of the Pathologist

The primary task of the anatomical pathologist when given a surgical biopsy or operative tissue specimen is to ensure that all diagnostic specimens have adequate pathologic examination for the purpose of providing a diagnosis and information that might be required for further patient management. Tissue requirements for pathologic diagnosis, gross and microscopic examination as well as surgical margins and extent of the lesion are of prime importance. These requirements must be met with before the harvesting of tissue for the Tissue Bank. This is to safeguard the patients' interest first and fulfill standard requirements of reporting for oncologic management in grading, staging and prognostic indicators.

### 2. Tissue Harvesting for Research

Harvesting of tissue for the additional requirement of research should be done by the pathologist or by personnel under direct supervision of a pathologist. Removal of part of an operative specimen before pathologic examination may compromise the diagnosis by affecting surgical margins or by the removal of portions of tissue required for diagnosis. Because pathologists are trained to identify and to separate diseased tissues from intermixed tissues grossly and microscopically, a pathologist must be involved in the quality control examination of tissues obtained for research. All institutional surgical pathologists should be supportive of this effort as in return, a tissue resource or repository will also benefit pathologists who wish to participate in research.

### 3. Tissue Banking at the Singapore General Hospital – Historical Status

Historically, the Department of Pathology has been the repository for human tissue obtained for diagnosis at the Singapore General Hospital. Tissue selected for diagnosis is stored as embedded tissue in paraffin blocks and the archival tissue is stored at the Department of Pathology at SGH, NUH Department of Pathology and specially leased storage areas. Storage has been for perpetually (about fifty years). Remnant human tissue not used for diagnostic purposes are stored, discarded or both. Pathologists may use the tissue for their own research. Up to now it is presumed that signed consent given by the patient for the surgical procedure to procure tissue for diagnostic purposes has implied within the consent the right to use the tissue whether in paraffin embedded blocks or remnant "wet-fixed tissue" for medical research. The extent of patient informed consent required remains an area of uncertainty and it is hoped the Human Genetics Subcommittee may in time address the issue.

Fresh tissue removed from operative specimens was not taken until storage facilities were available in the nineteen nineties with the availability of special deep freezers (liquid nitrogen or  $-70^{\circ}\text{C}$  freezer). The Department of Colorectal Surgery embarked on a research programme whereby tissue from colorectal cancers and other lesions were removed for storage.

In 1998, the Singapore Cancer Centre (now National Cancer Centre) set up a Tissue Bank and embarked on a programme to harvest tissue for research. A Tissue Banking Committee was set up under a Director and comprised members from various medical and surgical disciplines as well as research scientists from the Cancer Centre. Principles and Procedures guiding the workings of the NCC Tissue Repository were set up. I represented the Department of Pathology, SGH on the Committee.

It is necessary in my opinion as a pathologist and echoing the sentiments expressed in the earlier portion of this submission that certain ground rules regarding tissue harvesting for research be stated. They are in Enclosure I. These instructions were formulated after discussion with all the staff pathologists in SGH and the Head of the Department of Pathology.

4. Workings of the Tissue Bank – SGH. Current Status

There are no major problems with respect to conditions of use of the tissue. The details regarding standard procedures, ownership, etc may better be sought for through the Human Genetics Subcommittee seeking further information from the relevant authorities. Problems have arisen when tissue was harvested by non-pathologists, at times surgeons, without the knowledge of the pathologist. This has resulted in the compromise of diagnosis when certain information could not be obtained from the specimen which is cut-up before it reaches the pathologist. In an attempt to assist in providing the full pathological report, I requested that a list of harvested tissue from patients be sent to the Department on a regular basis in order that I might track the tissue for re-assembling should there be difficulty in orientating the specimen or even where the pathology is "missing". The pathologists in the Department are not in favour of having tissue removed prior to pathological gross assessment. There is no disagreement in obtaining tissue for research but there should be no compromise in accurate reporting of specimens. For medicolegal reasons, should the specimen be received with parts removed prior to examination, this should be indicated on the report issued to the surgeon (and patient).

I append a submission, Enclosure II by Dr Kent Mancer, Senior Consultant Pathologist who has had experience in this matter and has worked in various institutions in Canada and U.S.A.



5. Conclusion

My main address has been regarding the workings of tissue procurement from patients for research. I hope the Human Genetics Subcommittee will look into aspects of :

- Maintaining patients' rights with regard to how tissue is used – looking into the Donation Declaration and informed consent.
- Commercialization of genetic research in a market-driven economy.
- Should the standard consent or permission form contain a clause giving additional consent for the retention of tissue for the purpose of teaching or research.

Submitted by :

Dr Ivy Sng, FRCPA, AM  
Head, Histopathology Section  
Department of Pathology  
Singapore General Hospital

18 October 2001



# ACADEMY OF MEDICINE, SINGAPORE

PATRON: PRESIDENT OF REPUBLIC OF SINGAPORE

20<sup>th</sup> October 2001

Dr Angela Chong  
Chairperson  
Chapter of Pathologist  
Academy of Medicine Singapore

Dear Angela

## Ethical Issues on Tissue Banking

Thank you for inviting us to give our views on tissue banking. The issues related to tissue banking will certainly have an impact on surgeons because we are probably the main source of specimen collection for tissue banking. It is therefore timely that such issues be discussed and a consensus be arrived at.

It is our view that tissues collected for banking should remain the property of the institution and not to the individual. However, to encourage greater participation in tissue banking, some institutions have agreed that tissues collected for banking can only be used for research by the individuals who were responsible for its collection and this is over a stipulated period of time (eg. 2 years). We have no objections to such practices as the tissues are still under the jurisdiction of the institutions concerned.

The other issue for discussion is the method of tissue collection. Our stand on this is that the care and welfare of the patient is paramount and cannot be compromised. We would therefore recommend that all specimens should be sent intact to the pathologist before tissues are taken for banking. This is done to prevent the possibility of sending portions of the specimen which are essential for diagnosis for banking and leaving non-diagnostic specimens for the pathologist.

Another issue which we would like to highlight is that tissues sent for banking should be traceable to the patient from whom it was taken. This is necessary as there may be occasions when new information about the patient is discovered subsequent to tissue collection which may have an impact on those handling the tissues (eg. HIV positive status).

On the other hand, incidental findings of genetic defects or aberrations may be discovered during the course of research work on the banked tissues. We would like to recommend that under such circumstances, the researcher should not be obligated to act on these findings as the work is purely research in nature and should not have any direct clinical bearing on the patient.

We hope that we have been able to contribute in some way to your request. Thank you once again for giving us the opportunity to share our views on these important issues.

Yours sincerely,

Dr Christopher Goh  
Chairman  
Chapter of Surgeons

Head Office : 142 Neil Road, Singapore 088871  
Tel: (65) 2238968 Fax: (65) 2255155 E-mail: [main@academyofmedicine.edu.sg](mailto:main@academyofmedicine.edu.sg)

Branch Office : MD5 Level 3, National University of Singapore, 12 Medical Drive, Singapore 117598  
Tel: (65) 7771233 Fax: (65) 7779633 E-mail: [training@academyofmedicine.edu.sg](mailto:training@academyofmedicine.edu.sg)



# ACADEMY OF MEDICINE, SINGAPORE

PATRON: PRESIDENT OF REPUBLIC OF SINGAPORE

15 October 2001

Dear Chapter Members

## INTERIM GUIDELINES FOR AUTOPSY PRACTICE

Enclosed please find a copy of the Interim Guidelines for Autopsy Practice.

These have been drawn up by a subcommittee of the Chapter and are intended to serve merely as guidelines and are not meant to enforce any particular mode of practice or philosophy.

The Chapter would very much appreciate feedback regarding the interim guidelines.

The final position paper will be prepared after a reply from the Director of Medical Services regarding two specific issues raised.

Dr Angela Chong

Chairperson

Chapter of Pathologists 2001 – 2002

**Head Office** : 142 Neil Road, Singapore 088871  
Tel: (65) 2238968 Fax: (65) 2255155 E-mail: [main@academyofmedicine.edu.sg](mailto:main@academyofmedicine.edu.sg)

**Branch Office** : MD5 Level 3, National University of Singapore, 12 Medical Drive, Singapore 117598  
Tel: (65) 7771233 Fax: (65) 7779633 E-mail: [training@academyofmedicine.edu.sg](mailto:training@academyofmedicine.edu.sg)

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

INTERIM GUIDELINES

POST MORTEM AND RETENTION OF ORGANS AND TISSUES IN SINGAPORE

I. Introduction

1. Issues regarding retention of organs and tissues following autopsy have recently been the subject 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

Non-coronial autopsies : In Singapore these are performed by hospital or private pathologists and include adult, pediatric and perinatal deaths.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

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 : Presently 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.
9. Medicolegal cases : In cases where the attending pathologist feels that there could be a medicolegal issue, the pathologist should inform the Forensic services. (Duty Pathologist, Centre for Forensic Medicine through the duty officer, Police Radio tel : 2256879)

**Extent of Post-mortems (HUNS 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.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

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 of 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.

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.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

## 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. They are also occasionally requested by various authorities for 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

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

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". (attached appendix).
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.



Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

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 medicolegal 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 Prof No 14/75, ORGH 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". (Appendix 3)
3. The law requires deaths where the cause of death is not known to be made Coroner's cases. The committee understands from Dr Paul Chui that the corollary would be that non-coronial post-mortems should be performed only when the cause of death is known. As such it may be argued that the attending clinician should issue the CCOD prior to the post-mortem.
4. In light of this, the Chapter has written to the Director of Medical Services for clarification regarding the current status of the standing orders from Dr Kwa. Pending this, the Chapter advises members to confer closely with their clinical colleagues prior to performance of the post-mortem.
5. In this context, the committee encourages pathologists to include a cause of death statement in the autopsy report. The College of American Pathologists have stated in their Practice Guidelines for Autopsy Practice that it is preferable that certification be completed after a cause of death is determined at autopsy. However the college also recommends that the autopsy report address whether the autopsy findings are consistent with the cause of death as stated on the death certificate.
6. If there is a significant difference between actual and expected findings, the pathologist should recommend that the CCOD be amended.
7. 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.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

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.

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 traditional view is that the MTERA guidelines (requiring written permission from DMS before any procedure is commenced on

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

unclaimed bodies applies). The Chapter has written in to the DMS for clarification on this issue.

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. **Again a trained staff member or counselor 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.

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. Outstanding Issues**

Clarification from Director is pending regarding issuance of Cause of Death Certificate and the status of unclaimed bodies under MTERA. The letter written by the Chapter is appended for information of members.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

**References**

1. Circ Prof No 14/75, ORGH 20:05. Standing order on Death Certification, Coroner's Cases and Authorisation for Use of Unclaimed Bodies. Dr SB Kwa.
  2. Autopsy Performance and Reporting. College of American Pathologists. Hutchins GM ed.
  3. Guidelines for Post-Mortem Reports. Royal College of Pathologists, 2000.
  4. Criminal Procedure Code 1970 Republic of Singapore.
  5. Medical (Therapy, Education and Research) Act 1972 Republic of Singapore.
  6. The Autopsy and Audit. Royal College of Pathologists, 1991.
  7. Guidelines For The Retention Of Tissues And Organs At Post-Mortem Examination. The Royal College Of Pathologists. March 2000.
  8. The Removal, Retention and Use of Human Organs and Tissue from Post-Mortem Examination. Advice from the Chief Medical Officer. Dept of Health, London. 2001.
- Elam G. Consent to Organ and Tissue Retention at Post-Mortem Examination and Disposal of Human Materials. NHS Trust Dec 2000.
- Proceedings from the Human Tissue Workshop for fellows. Royal College of Pathologists of Australasia. March 2001.

Chapter of Pathologists, Academy of Medicine, Singapore  
15/10/2001

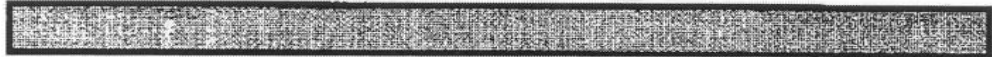
Appendix

1. Standing Orders from Dr Kwa Soon Bee.
2. Letter to Director of Medical Services.
3. Letter to Dr Pwee Keng Ho.
4. Sample Consent, College of American Pathologists.
5. Comments from Dr Norman Walford.

# **GUIDELINES: ETHICS OF LABORATORY PRACTICE**

Prepared by  
Working Committee  
Chapter of Pathologists 1999 - 2000  
Academy of Medicine, Singapore

# CONTENTS



Guidelines : Ethics of Laboratory Practice	2
References	9
Appendix I	10
Appendix II	12

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

### **1 INTRODUCTION**

- 1.1 Pathology is a clinical service which carries out investigations on specimens from patients as an aid to the diagnosis, management and treatment of disease. Departments of Pathology also provide specialist interpretation of the tests and advice.
- 1.2 In Singapore, pathologists are medical specialists recognised and named on the register of specialists kept by the Singapore Medical Council and are governed by the ethical code of the Singapore Medical Council.
- 1.3 The practice of pathology is continually changing. Currently the four traditional branches of pathology - anatomical pathology, microbiology, haematology, and chemical pathology have been joined by an increasing number of subspecialties such as immunology, genetics and molecular pathology. This list and the work undertaken, will continue to expand.
- 1.4 Modern technology has provided improved laboratory information systems and electronic communication. Technical advancements and new methodology have resulted in new ways to investigate, archive and preserve human samples, be it tissue, body fluids and cells or blood and blood products. Pathologists now find themselves gatekeepers of a plethora of information and archival specimens, the value and potential implications of which are not properly understood or specifically addressed in law.
- 1.5 It is the purpose of this paper to highlight possible problems that may arise and suggest guidelines for ethical laboratory practice. Matters pertaining to issues arising from postmortem (both coronial and noncoronial) examinations will be addressed in a separate paper.
- 1.6 From time to time the Licensing and Accreditation Branch, Ministry of Health (previously known as the Medical Audit Accreditation Unit) has also sought the opinion of the Chapter. The Chapter has responded to the best of its ability and the correspondence is appended for reference.

## **2**

### **Chapter of Pathologists, Academy of Medicine, Singapore**



## GUIDELINES : ETHICS OF LABORATORY PRACTICE

### 2 RESPONSIBILITY

- 2.1. As a member of the medical profession, the pathologist has professional obligations to his patients, to the profession and to society. This is set out in the Ethical Code of the Singapore Medical Council. (Published 1995)
- 2.2. As a medical laboratory professional, the pathologist has a duty to ensure that tests performed in the laboratory are of a high professional standard, and that the requirements of regulatory authorities and professional organisations are complied with in the laboratory.

### 3. SPECIMEN ACCESSION and CONSENT

- 3.1. The pathologist should be aware that no medical action or investigation, can proceed without the patient's consent.
- 3.2. The medical laboratory usually receives 'sent in' specimens (tissue, blood, body fluids) with a request for examination. In these cases, the laboratory is entitled to assume that the requesting physician has obtained the requisite consent.
- 3.3. For this reason, the Chapter recommends that pathology laboratories only accept requests/ specimens from registered medical practitioners of good standing. (Ref Appendix I)
- 3.4. Consent is usually inferred when a patient willingly presents himself to the laboratory for a specific test procedure. However the pathologist in charge of the laboratory should ensure that the patient understands the test procedure and the implications of the test.
- 3.5. There may be occasion where a laboratory may decide to process a request from a member of the general public. Should this occur, the laboratory must have medically qualified personnel on site. The import of abnormal tests should be explained and the patient advised to consult, or be given the opportunity to be referred to a qualified, registered physician for further management. (Ref Appendix II)

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

### **4. LABORATORY RECORDS**

- 4.1 Laboratory records are part of a patient's medical records and should be treated with the same degree of confidentiality. Unauthorised disclosure of information obtained from patients in confidence or in the course of attending to a patient is a breach of the doctor's professional duty of confidence. However, disclosure may be required by law, or in interests of public safety.
- 4.2 Pathology tests carried out in the medical laboratory are requested by physicians in the course of investigation or treatment and are generally considered a consultation between an attending clinician and the laboratory physician. The pathologist / laboratory on completion of the test usually reports or transmits the results of the tests through the requesting physician.
- 4.3 The Chapter is of the opinion that if a patient is transferred to another institution, or changes his/her primary physician, copies of the laboratory results should ideally be furnished by the original/referring physician as part of the patient's case records. The laboratory is generally not party to the transfer and has no way of corroborating this information.
- 4.4 The laboratory may be presented with requests for test results from other physicians or other hospitals (which were not originally indicated on the request or accession form). The laboratory, in these cases assumes that the patient has been referred for further management and releases results in good faith. In these cases, the Chapter suggests that such requests be accompanied by a simple statement stating that the patient is now under the care of that particular physician and that the patient consents to releasing of results.
- 4.5 All other requests for release of information, especially to third parties e.g. insurance agencies, should be accompanied by written documentation of the patient's consent.

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

- 4.6 In the case of genome and DNA testing, similar principles of privacy, confidentiality and security apply. Sampling of DNA for analysis should remain a medical act and be part of medically recognised practice. Results of these tests should be revealed only to the patient and the attending physician. Parents and family members may not have the automatic right of access.
- 4.7 The Chapter strongly recommends that all laboratories should have written guidelines regarding release of information. The laboratory has a right, and duty to first satisfy itself as to the identity of the person requesting information. The laboratory has a right to refuse release of information.
- 4.8 The pathologist/laboratory should also take reasonable precautions to ensure that the method of release of information is secure and reliable. There should be safeguards regarding accidental release of information, including electronic information.

### **5. DATA REGISTRIES**

- 5.1 Disclosure of medical records to data registries e.g. cancer registries, tissue registries, are often asked for. While this is an important resource for epidemiological research, laboratories should be cognizant that there may be legal and ethical issues as regards collection, storage and use of such information.
- 5.2 Release of information regarding infectious diseases, for instance HIV are governed by acts of law and statutory obligations will have to be complied with.
- 5.3 The French National Consultative Ethics Committee advises that laboratories should disclose information only to accredited organisations which have:
- i) guarantees of confidentiality
  - ii) an accountable person in charge
  - iii) policies whereby researchers given access to the information are restricted from contacting patients.
- 5.4 Except where notification is governed by law, the best policy would be to obtain consent from the patient for inclusion into a registry. This is to avoid potential disputes arising between patients and laboratories regarding disclosure of confidential medical records. Laboratories may be held responsible for unauthorised disclosure.

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

- 5.5 Pathologists may not have direct communication with the patient. To avoid misunderstanding, the French National Ethics Committee suggests that release of confidential medical information to accredited organisations or registries be made by the attending physician, after first obtaining consent from the patient. Although individual practices may differ, the Chapter would like to bring this arrangement to the attention of its members.
- 5.6 The Chapter suggests that all requests for disclosure of patient data records for research projects be covered by express permission from the ethics committee of their respective institution or hospital.
- 5.7 The ethical principles surrounding keeping and using of medical registers also apply to DNA banks. An individual's genome is part of his bodily person and should be treated with similar respect.

## **6. HUMAN TISSUE**

- 6.1 The pathology laboratory receives specimens e.g. tissue, blood, blood products, body fluids, for analysis and testing. All tissue removed in the course of investigation or therapy should be submitted to the pathologist /pathology laboratory for analysis as diagnosis is of primary importance.
- 6.2 Residual tissue/ blood/ fluids from therapeutic or investigational procedures which are no longer required for diagnostic purposes have traditionally been regarded as 'abandoned goods' and have been used as a source of research / teaching material or as material for clinical controls. This includes excess fluids e.g. plasma from a clinical blood test which may be used in a clinical laboratory to ensure quality of instrument analysis. As these are anonymised and not linked to patients, specific consent is not sought. This is the current accepted practice but as illustrated in the recent revision of guidelines by the RCPATH and as a direct outcome of inquiries such as in Bristol, the legal and ethical rules governing this area is rapidly changing and may need to be reviewed from time to time to ensure conformity with public expectation. Please refer to para.7.3.

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

- 6.3 The Royal College of Pathologists and the Nuffield Council on Bioethics have recommended that standard consent forms include the possibility that tissue removed in the course of treatment be stored or used for medical research or education. This would in effect cover the concerns raised in paragraph 6.2. The patient, their legal guardians or other legally authorised persons have a right to refuse this request.
- 6.4 In the case of archived diagnostic material e.g. paraffin tissue blocks, the pathologist has substantially transformed specimens from their original state. The Royal College of Pathologists in 1999 stated that 'The durable material thus produced can be considered the property of the entity which produced them.' Even within this framework, the pathologist or hospital acts as the custodian or steward.
- 6.5 The laboratory providing the primary diagnostic analysis is responsible for the maintenance and integrity of the archival tissue and are hence stewards of the patient's tissue. While researchers should not be prevented from using this tissue, the pathologist must ensure that there are sufficient safeguards regarding patient confidentiality, and also that sufficient tissue is left for diagnostic review or for subsequent prognostication.
- 6.6 Tissue removed expressly for research should have approval from national/institutional ethics boards and must have documentation of informed consent. The interim report from the Bristol Inquiry includes a recommendation that unless tissue removed is to be used only for that one single project, that consent for continued storage and future use also be obtained.
- 6.7 The Chapter joins other pathology associations in recommending that each laboratory should have guidelines regarding provision of tissue (archival or residual) for research, and strongly advises that all projects have been approved by relevant authorities. The laboratory should have the right to refuse release of tissue should any of the above criteria not be fulfilled.
- 6.8 The laboratory must also have guidelines and records regarding proper disposal of excess or discarded tissue.

## **GUIDELINES : ETHICS OF LABORATORY PRACTICE**

### **7. TISSUE BANKS**

- 7.1 Pathologists involved in tissue banking should ensure that the bank has been approved by the Ministry of Health, Singapore. Hospitals, clinics and other entities covered by the Private Hospitals and Medical Clinics Act are required to secure written permission from the Director of Medical Services in advance of starting tissue or sperm banking.
- 7.2 Laboratories should be aware of problems associated with commercial use of human tissue. Laboratories involved in tissue banking should also ensure that the bank has guidelines to prevent misuse and mishandling of tissue and that tissue samples are anonymised.
- 7.3 Generally tissue taken for tissue banking is tissue which has been removed in the course of therapeutic or investigational procedures but is no longer required for diagnostic purposes. The medical community has an ethical obligation to inform patients of how it intends to use this tissue. An informed consent is recommended.

### **8. CONCLUSION**

The World Health Organisation and the Council of Europe states that 'when in the course of intervention, any part of the human body is removed, it may be stored and used for a purpose other than that for which it was removed only if this is done in conformity with appropriate information and consent'. The Chapter endorses this view.

#### **WORKING COMMITTEE :-**

#### **CHAPTER OF PATHOLOGISTS 1999-2000**

#### **ACADEMY OF MEDICINE, SINGAPORE**

Dr Angela P Y Chong  
 Dr Ling Moi Lin  
 Dr Tan Ai Ling  
 Dr Inese Busmanis  
 Dr Gilbert S C Chiang  
 Dr Raymond Lin

## GUIDELINES : ETHICS OF LABORATORY PRACTICE

### REFERENCES

1. International Code of Medical Ethics, World Medical Association, 1949  
World Medical Association Declaration of Helsinki. Revised edition, Hong Kong, China  
41<sup>st</sup> World Medical Assembly, 1989.
2. The Singapore Medical Council Ethical Code, May 1995.
3. Ethical Practice In Laboratory Medicine and Forensic Pathology. WHO Regional Office  
for the Eastern Mediterranean 1989.
4. Consensus Statement of Recommended Policies for Uses of Human Tissue in Research  
Education and Quality Control. Royal College of Pathologists and the Institute of  
Biomedical Science. Royal College of Pathologists 1999.
5. Nuffield Council on Bioethics. Human Tissue: Ethical and Legal Issues. London, Nuffield  
Council on Bioethics, 1995.
6. Guidelines for the Retention of Tissues at Postmortem. Royal College of Pathologists,  
2000.
7. Interim Report, The Bristol Royal Infirmary Inquiry, United Kingdom, May 2000.
8. Comite Consultatif National d’Ethique pour les sciences de la vie et de la sante,  
Nos 4 (1985); 25,27 (1991) and 58 (1998).
9. Kaan T. International Encyclopedia of Laws. Medical law Suppl 17 Dec 1998.  
Ed R Blanpain.
10. Kaan T. Rights, Ethics and the Commercialisation of the Human Body. Presented at  
Faculty of Law Seminar “The Emerging Life Sciences : Law, Ethics & Intellectual  
Property”, Sept 2000. To be published in December 2000 issue of the Singapore Journal  
of Legal Studies.