A Model Forensic Pathology Service

Prepared for the Inquiry into Pediatric Forensic Pathology, Ontario, Canada

Author Page

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Abbreviations

CCRTF	Consultative Committee on Road Traffic Fatalities
CLS	Clinical Liaison Service
CME	Continuing medical education
CT (CAT)	Computerized (axial) tomography; CT scanning
DVI	Disaster victim identification
FTE	Full-time equivalent
KPI	Key Performance Indicator
MLDI	Medico-legal death investigation
NATA	National Association of Testing Authorities (Australia)
NCIS	National Coroners Information System
NHS	National Health Service (U.K.)
Pa	Per annum
QA	Quality assurance
QAP	Quality assurance program
QMS	Quality management system
RCPA	Royal College of Pathologists of Australasia
SCO	State Coroners Office (Victoria)
SIDS	Sudden Infant Death Syndrome
SUDI	Sudden Unexpected Death in Infancy
VIFM	Victorian Institute of Forensic Medicine
WRLS	Workplace Related Liaison Service
24/7	24 hours a day, 7 days a week. Usually in relation to availability of a service.

Glossary

Accountability	A system or process designed to assure the proper discharge of responsibility by a person or institution.
Accreditation	A formal audit by independent external auditors of institutional processes against agreed industry wide standards. Passing the audit means the institutions is accredited.
Anatomical pathology	A subdiscipline of pathology comprising morbid anatomy (the macroscopic or naked-eye evaluation or diagnosis of diseased tissue and organs) and histopathology, which is the microscopic evaluation or diagnosis of diseased tissue. Sometimes referred to as surgical pathology.
Audit	Evaluation of compliance with a standard.

Autopsy	The post-mortem examination of a body involving its external and internal examination and incorporating the results of special tests. In a full autopsy, the internal examination involves, but is not limited to, examining the contents of the cranium, chest, and abdomen. Further dissection can and should occur in particular circumstances.
Clinical pathology	Hospital- or laboratory-based pathology consisting mainly of anatomical (surgical) pathology, hematology, microbiology, chemical pathology (biochemistry), immunology, cytogenetics, molecular biology, and others. (It is contrasted in this paper to forensic pathology.)
"Coming up to proof"	Presenting in oral evidence or testimony the same information and opinions as provided in written statements and pretrial discussions; not "backing down" on previous statements.
Coronary atherosclerosis	Colloquially, hardening of the arteries of the heart. Narrowing of the arteries of the heart (the coronary arteries) by fatty material (atheroma, comprised of cholesterol and related material). The common form of heart disease in the developed world. When the narrowing of the arteries is severe it is regarded as capable of causing sudden death.
Coroner	In some jurisdictions, the official responsible for death investigation. In the U.K. and Australia, coroners tend to have legal backgrounds. In Ontario, coroners are doctors (but not forensic pathologists). As a system of death investigation, often contrasted with the medical examiner system.
Credibility	A personal or institutional characteristic of providing reliable, correct advice and opinion.
Death certification system	Really the "cause of death" certification system. The vast bulk of deaths are dealt with by doctors who certify the natural cause from which the patient died. This is sufficient information for the deceased to then be buried.
Death investigation system	This is the system that deals with those deaths not certified as natural causes deaths by doctors. These deaths are of the kind required by statute to be reported, in the case of Ontario, to coroners.
Disaster victim identification	The scene and mortuary based processes of dealing with a multiple fatality event, or mass disaster to ensure that individuals are correctly identified. Undertaken in accordance with Interpol guidelines.
Forensic	Relating to the courts, or more generally, the law.
Forensic entomology	The study of insects in relation to the law, in particular to the investigation of deaths, especially the time elapsed since death.
Forensic odontology	The study of dentistry in relation to the law, in particular to the investigation of death, especially the identification of human remains.
Forensic pathology	Part of pathology; the study of pathology in relation to the law, in particular to the investigation of sudden and unexpected deaths from all causes; the discipline of pathology concerned with the investigation of deaths where there are medico-legal implications.
Governance	A system of oversight within an organization to assure the proper discharge of responsibility.
Histology, histopathology	The study of the microscopic structure of tissues (histology) in a diseased state (histopathology).
Infant, infancy	In this paper, a baby up to the age of 12 months. Sometimes refers to the period following the neonatal (qv) period and up to 12 months of age.
Inquest	A public hearing, usually in relation to a death.
Inter alia	Amongst other people or other things

Key Performance Indicator (KPI)	A measure of performance that incorporates elements such as quality or timeliness as opposed to an output measure, which is simply a number of particular outputs. One KPI might be the average time taken to produce reports (or the average time taken for the body to be available for funeral directors after the autopsy is ordered), whereas the output measure is simply the number of reports produced in a month or a year (or the number of autopsies performed).
Manner of death	The way, or circumstances, in which the death occurred; broadly, whether accidental, suicidal, homicidal, or natural.
Medical examiner system	A form of death investigation system presided over by a forensic pathologist (usually) who carries responsibilities often divided between a coroner and a forensic pathologist in a coronial system. This system often lacks the emphasis on public hearings inherent in a judicial coroners' system.
Medico-legal death investigation	Term used in this paper to indicate the totality of the forensic pathology investigation. It may include an autopsy, and many other investigative modalities as well, which all combined produce the final result. Other elements include: evaluating the deceased's medical record; consulting with medical attendants; receiving information from police; attending the scene; evaluating photographs of the scene; considering statements of witnesses; discussing with subspecialty pathologists or clinicians, etc.
Morbid anatomy	The macroscopic or naked-eye evaluation of diseased tissue or organs.
Myocarditis	Inflammation of the heart muscle (e.g., from viral infection).
Negative autopsy	No positive findings or specific pathological changes seen during the autopsy that allows a conclusion about the cause of death to be made.
Neonate, neonatal	The period from birth to 28 days postpartum; sometimes the period from birth to 7 days postpartum.
Pediatrics	That branch of medicine involving the diagnosis and treatment of illness in children. It has long been recognized as a separate medical specialty because of the different medical issues that children and adults face.
Pediatric forensic pathology	According to Byard and Krous (2004),[1] pediatric forensic pathology is a subspecialty of forensic pathology dealing with cases involving children. They define it as the study of diseases and injuries of children with subsequent medico-legal interpretation of findings for police and the courts.
Pathology	The study of disease (which includes injury), and the ways in which disease processes affect our bodies; recognizing the pattern that disease takes allows an understanding of the root of a problem, enabling accurate diagnosis, treatment, and prevention.
Peer review	Review by a person of material generated by another person of the same kind. For example, review by one forensic pathologist of the report and findings of another forensic pathologist for the purpose of assuring and/or controlling the quality of the report and its findings.
Post-mortem examination	See autopsy.
Quality assurance	A step or activity designed to improve the probability that the results of the individual/organization are reliable.
Quality control	A step or activity designed to improve the probability that the particular result

[1] R.W. Byard and H.F. Krous, "Pediatric Forensic Pathology in Crisis" (2004) 7(3) *Pediatric and Developmental Pathology* 212–213.

	is correct.
Quality management system	The overall system within an organization designed to improve the probability that its results are reliable.
Reliability	The reliability of a result is its stability when applied by different observers in different places at different times.
Reviewability	One of the aims of the autopsy is that it (and indeed the whole medico-legal death investigation) is conducted in such a way that another forensic pathologist at another time can independently come to his/her own conclusions about the death.
Sudden Infant Death Syndrome (SIDS)	The sudden unexpected death of an infant under 12 months of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of the death and clinical history.[2]
Sudden Unexpected Death in Infancy	All sudden unexpected deaths of infants under 12 months of age (sometimes used as a diagnosis of the cause of death, which is the equivalent of "unascertained" or " undetermined").
Toxicology	The science of drugs and poisons. Capacity to detect drugs and poisons in fluids and tissues sampled at autopsy is a critical component of a proper forensic pathology service.
Transparency	When this term is used in relation to institutional processes, it means that these processes can be evaluated externally because the detail of the process is available to be examined.
Validity	In relation to a measure or a result, it means the extent to which the measure or result reflects the truth of the phenomenon.

[2] H. Krous et al., "Sudden Infant Death Syndrome and Unclassified Sudden Infant Deaths: A Definitional and Diagnostic Approach" (2004) 114(1) *Pediatrics* 234–8.

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Preface

We were asked by the Commission to prepare a paper on a model forensic pathology service. There is a particular challenge in writing such a paper. A service such as forensic pathology will need to fit into the local context and we are not Canadians, let alone from Ontario. Clearly, familiarity with local contextual detail is beyond our capacity, based as we are in Melbourne. Our starting point has been that the review of the system of pediatric forensic pathology in Ontario being undertaken by the Commission represents an opportunity to consider the best possible arrangements for death investigation, untrammelled by historical happenstance and individual personality. We have taken a "blank sheet approach" to describe what we consider to be the model arrangements for provision of forensic pathology in the service of death investigation, drawing on the experience at the Victorian Institute of Forensic Medicine (VIFM). What we have tried to do is start from principle and set out such a service in functional terms.

An important and correct assumption has been made in asking for a paper on a model forensic pathology system. In reality there is no operational sub-subspecialty of pediatric forensic pathology. Pediatric forensic pathology makes best sense when thought of as an identifiable group of cases, a subset of work, within a forensic pathology operation, institution, or system.

Being commissioned by an Inquiry that arises, as it does, from some criminal justice applications of pediatric forensic pathology, this paper concentrates more on that dimension of forensic pathology practice. It is important, however, that sight is not lost of the wider contributions that can be made by, and which we believe is expected of, a dynamic contemporary forensic pathology service.

No assumption should be made that because an issue is discussed in a particular way, this means the authors have formed a view about any aspect of a case that might be in the purview of the Commission. The key point to take away from this paper is that a model forensic pathology service is

likely to be delivered by an institution designed for the purpose. Such an institution is also likely to be the best safeguard against failure and to deliver more of the very important benefits available from forensic pathology for the community.

We would like to acknowledge the many editorial comments and suggestions of Professor Kent Roach, which materially improved this paper. The deficiencies, however, remain ours.

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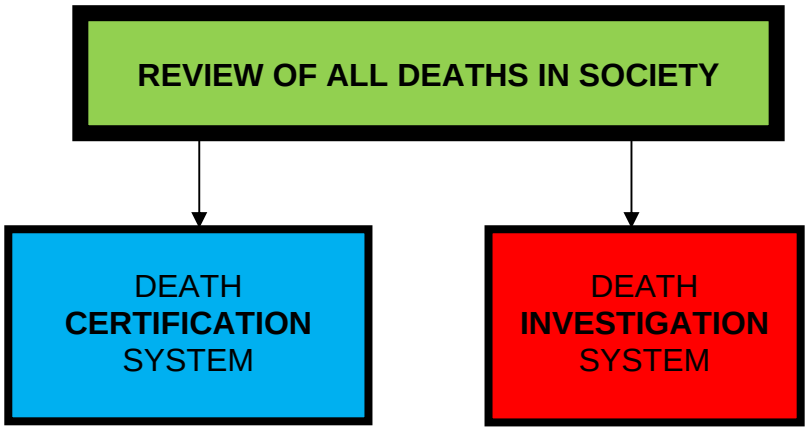
1. A Principled System for Death Investigation

The Inquiry into Pediatric Forensic Pathology in Ontario represents an opportunity to consider the best possible arrangements for medico-legal death investigation. This paper takes a "blank-sheet approach" to describe what are considered by the authors to be the functional components of forensic pathology necessary to deliver a model medico-legal death investigation service. We have drawn heavily on our experience at the Victorian Institute of Forensic Medicine (VIFM). We do not consider institutional structure so much because we are not sufficiently familiar with the local context in Ontario.

If one considers how society deals with all deaths, the vast bulk is dealt with by doctors signing a "death certificate" (Certificate concerning the cause of death). This is the death certification system. The minority of deaths, all those where there is no "death certificate" provided by a doctor, or those in defined categories, enter what we call the death investigation system. Forensic pathology is the essential and core intellectual component of the death investigation system. (We could have called this the coroners' system, but we have preferred to employ neutral terminology, so that the focus remains, for the purpose of this paper, on the forensic pathology service.)



A model death investigation system

The primary purpose of this paper is to articulate the functional elements of a model forensic pathology service. In order to define such a model there needs to be an understanding of the purposes of the death investigation system. As part of a review of the legislative framework for death investigation in Victoria,[3] the VIFM undertook an exercise to define the reasons why a death investigation system is important—what are its fundamental purposes? It was then useful to set out the necessary services required to achieve those purposes, and the principles by which those services should be delivered. We considered that with agreement on these underpinnings, it would then be possible to coherently define roles, draw boundaries, and assess suggestions for improving our current death investigation system, including the model for delivering forensic pathology services.

This chapter outlines the purposes, services, and principles that we consider to be the underpinnings of an effective death investigation system. It is predicated on the assumption that there is a functioning death certification system, which provides a base level of "investigation" for all deaths. In Victoria, the majority (about 87% of all deaths) are subject only to this level of review—by a doctor who provides a death certificate on the basis of the known medical history. A minority (about 13%) enter the death investigation system. In Victoria, this is a coroners' system.[4]

Purposes of the death investigation system

A reliable death investigation system is essential to a properly functioning justice system, which in turn underpins a safe and fair society. The fundamental purposes of the death investigation system could be regarded as follows:

[3] The Victorian Parliament Law Reform Committee tabled a report "Coroners Act 1985, Final Report" in September 2006; see http://www.parliament.vic.gov.au/lawreform/. Implementation of reforms arising from the review are currently being developed.

[4] See Coroners Act 1985 (Vic). Coroners are magistrates who are responsible for investigating the death and making findings. A coroner must find the identity of the deceased, the cause of death, and how the death

- In the public interest, to ensure that defined deaths are subject to independent and accountable investigation and judicial review to underpin criminal and civil justice
- To determine who has died, why and how the death occurred, and to determine if further action should be taken in relation to the death
- To use information derived from the investigation to try and prevent other death and injuries
- To support family, friends, and others directly affected by these deaths

The services necessary to meet the purposes

- Timely and accurate reporting of defined categories of death (underpinned, as a necessary corollary, by an accurate death certification system)
- Timely identification of the deceased
- Thorough and timely information gathering including, where relevant, from the scene, family, friends, associates, witnesses, medical and other records
- Medical and scientific investigation of the cause and circumstances of death
- Acute bereavement support and referral for families and others directly affected by the death investigations
- Information provision and liaison for families and others directly affected by death investigations
- Management of families where medical investigation reveals matters of significance including the possibility of inherited disease
- Coordinated case management including a standardized investigation model for further investigation of cause and circumstances of deaths by relevant experts of cases unresolved by

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occurred. Apart from some mandatory inquests into certain prescribed deaths, Inquests are largely discretionary and are held when there appears to be matters of public interest at stake.

medical and scientific investigation (e.g., engineers, researchers, police, specialized investigators—fire, workplace, electricity, etc., lawyers)

- Collection and management of death investigation information and evidence
- Judicial assessment of investigation evidence
- Provision of findings and recommendations, including ensuring these are effectively communicated to all relevant parties, including families
- Liaison, audit, and reporting re responses to recommendations arising from death investigations
- Public education about the death investigation system
- Policy development to underpin service provision
- Training and professional development for death investigation system staff and other agencies involved in the death investigation

The principles that should be applied to achieve the purposes and to provide the services

- Death investigations must be undertaken within a judicial, legislated model applying the principles of natural justice and judicial independence. This includes the structural and operational arrangements for death investigations providing for clear role definition, independence, and accountability of the individuals and agencies involved.
- Taking account of legal and ethical requirements, all death investigation services must be undertaken with a therapeutic approach,[5,6] including sensitivity to different cultures and faiths.

[5] This recognizes the potential for psychological and other health implications of these services. The relevant agencies must not cause further harm and should assist with healing. The Coroner's role in education and public health and safety provides an additional therapeutic basis to the investigation from a community perspective.
[6] I. Freckelton, "Death Investigation, the Coroner and Therapeutic Jurisprudence" (2007) 15 *Journal of Law and Medicine* 264.

- Each reported death must be investigated to the extent necessary to meet the purposes of the death investigation system, acknowledging that in some instances these purposes may need to be balanced against each other.
- The services necessary to meet the purposes must be undertaken by those with the most relevant expertise.
- All agencies involved in death investigation must take a collaborative approach involving effective and efficient communication.
- Consistent standards of death investigations must apply across the jurisdiction. (To this end, written standards should be developed and applied.)

These principles and outputs are required for an effective death investigation system. Which agencies should be responsible for what depends on how forensic pathology is conceived of in the jurisdiction? Let us now focus some attention on the core of the death investigation system, forensic pathology.

2. Introducing Forensic Pathology—The Core Discipline in Death Investigation

Introduction

Forensic pathology is the core discipline in the medico-legal investigation of death. It is not the only discipline, but it is the main one, and it is common to every developed death investigation system. More specifically, it is the medical, autopsy-based specialty within pathology at the heart of death investigation.[7] Indeed, the difference in death investigation systems between jurisdictions in the developed world can be seen as the different ways in which forensic pathology is harnessed. There can be oversight by a coroner, a medical examiner, or a judge, but there is always forensic pathology. It is not the purpose of this paper to debate in detail the benefits and disadvantages of different systems. It is our view that the benefits of a model forensic pathology service can be delivered whatever the system if the will and resources are there.

Forensic pathology: A paradigm shift from the rest of medicine

It is important to understand that forensic pathology is quite different to the rest of medicine. Medicine exists to serve patients. Starting with doctors' training as medical students, everything revolves around the patient. Doctors' obligations to patients are central. This culture, imbued during medical training, survives intact through to the practice of virtually every branch of medicine, including all the disciplines within pathology, with the exception of forensic pathology. In forensic pathology there is no traditional patient.

[7] This definition is not universal. In Europe, and in jurisdictions with legal systems derived from continental Europe, legal medicine/medicin legale/rechtzmedizin is a medical specialty in its own right separate from pathology. It is effectively a combination of forensic pathology, clinical forensic medicine, and even forensic psychiatry.

Inclined as doctors are to look for a patient, forensic pathologists sometimes see one in the family of the deceased. Certainly many forensic pathologists feel instinctively that they should provide, by one means or another, information to the family about what they have found. This might be to allay the family's usually unfounded feelings of guilt about the death, or to provide understanding generally about the death, which is important in itself and can affect the course of grieving. Increasingly, forensic pathologists are discovering information during the course of the autopsy of a genetic kind that may be of direct medical significance to surviving members of the family.

These clinical obligations coexist with the fact that forensic pathologists have become involved at the behest of the state's justice system, primarily to help look after the state's interest in understanding why its citizens have died. This assistance is provided through the medium of the law; a medium in which doctors have little or no formal education and whose method of operation is quite different, even strange, to many of them. Mechanistically, this assistance is initiated by coroners, medical examiners, or judges (depending upon the system), often through the agency of the police. In cases where there may be prosecutions, forensic pathologists from the model forensic pathology service see themselves as agents of justice with primary obligations to the court.

The practice of medicine is geared toward diagnosis as a step along the way to treatment and cure or control. This is an entirely different paradigm to diagnosis and conclusions made as part of investigating civil and criminal wrongs, charging a suspect, and having a trial. But, it has to be said, there has been relatively little done formally to build solid bridges between the two paradigms. These differences have a particular application within the discipline of pathology, with contrasts between clinical and forensic pathology.

Comparing forensic pathology and clinical pathology

If forensic pathology is distinctively different to medicine generally, how does it compare with clinical pathology? The fundamental principles of pathology applied in the work of the forensic pathologist are the same as those employed by the clinical pathologist. However, the analytical processes involved are both distinctly different, as the results are applied in different paradigms. The forensic pathologist's focus is the end point of the forensic investigation, which is a judicial process, usually a criminal court trial, an inquest, or a coroner's finding made without inquest. That contrasts with the clinical pathologist's focus on providing diagnostically useful advice to a clinician for use in the medical management of a patient. This is not to say that the forensic pathologist ignores broad community interests in relation to public health and safety. Indeed, much of the work of the death investigation system should involve a focus on issues of health and safety, and hazard recognition. The essential difference between those pathologists engaged in clinical, hospital-related practice and those engaged in forensic pathology practice was set out in the Brodrick Report:

> Do the police need the services of a special kind of pathologist who can for the most part be distinguished from a clinical pathologist in a hospital? Do coroners need the services of the same kind of pathologist as the police? Our answer to the first question is an unequivocal 'Yes'. We accept the view that while every forensic pathologist needs to be a competent morbid anatomist, the reverse statement does not follow: Many morbid anatomists will never have the inclination to undertake forensic work, i.e. work for the police or the criminal courts. The nature of the problems most often encountered in criminal investigation is different from that most often encountered in clinical work. So are the circumstances in which the two kinds of pathologists are called upon to work. The Forensic Pathologist may be required in fieldwork literally! There is also a difference between writing an opinion for a colleague, and giving evidence based on that opinion or being cross-examined on that opinion in the criminal court. There are pathologists who feel attracted to this particular kind of challenge and also

have the ability to cope with it, and there are pathologists who do not feel this urge and who may not have the right attributes.[8]

Having compared clinical and forensic pathology, it might be of interest to compare the focus of a pediatric and a forensic pathologist responsible for the medico-legal investigation of a baby's death (see Table 1). It should be understood that this is from the perspective of forensic pathology.

Table 1—The focus of pediatric and forensic pathology in relation to a baby's death: Common elements and differences

Pediatric Pathology Focus	Common Focus	Forensic Pathology Focus
Forensic pathology usually a small aspect of the work of the pediatric pathologist, who is otherwise focused on a hospital-based anatomical pathology service	Both are subdisciplines of anatomical pathology	A particular case type within the daily work of death investigation
Natural disease aetiology and pathogenesis	Autopsy technique	Identifying admissible evidence
Unusual, rare syndromes and conditions	Autopsy documentation	Meeting coroner/police/investigators' needs
"What they think happened"	Genetic issues	Meeting the needs of all parties to any action, in any jurisdiction
	Family counselling	Importance of evidence management
	Evaluating medical treatment	Communication with jury and the court
	Education and research	

While clearly there are people who are not suited to forensic pathology, it is difficult to generalize. The forensic pathologist has to be trained in, and develop an understanding and aptitude for, the legal process of investigation in conjunction with his or her knowledge of the scientific process of investigation. Furthermore, there needs to be an ability to communicate with the legal

[8] *Report of the Committee on Death Certification and Coroners* (the "Brodrick Report"), 1971, Cmnd 4810,

process. It is no criticism, as it is not relevant to day-to-day clinical practice, but few medical practitioners have any real understanding of or feel for the legal investigative method. It is a knowledge of the role that legal systems play in society, as well as an understanding of the legal process and legal method, that is one of the features that distinguishes forensic pathologists from their clinical counterparts. Certainly there are areas of specialist factual knowledge with which forensic pathologists are familiar and their clinical counterparts are not. However, simply acquiring factual knowledge on forensic issues will not provide a clinical pathologist with sufficient skills to undertake forensic work. There are a number of other skills required to supplement the different knowledge set, including (but not limited to) the formulation of opinions, the writing of reports, and presenting testimony in legal settings.[9] (See also Appendix 3: Forensic Pathology section of the Trainee Handbook of the Royal College of Pathologists of Australasia.)

Forensic pathology practice—Metropolitan and regional

Full-time forensic pathology practice takes different forms. For example, in Darwin (the capital of Australia's Northern Territory, as large as France, with a population of 200,000), there is one full-time pathologist practising forensic pathology for the entire jurisdiction, doing everything to provide a 24/7 service, and necessarily working in isolation.

Forensic pathology practice in these circumstances is vastly different to its counterpart in the larger capitals, for example, Melbourne. There, a purpose-built forensic medicine[10] institute employs

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HMSO.

[9] See I. Freckleton and D. Ranson, "The Medical Report and the Giving of Expert Evidence," chap. 15 in *Death Investigation and the Coroner's Inquest* (Oxford University Press, 2006).

[10] The Victorian Institute of Forensic Medicine was formed in 1987 as the Victorian Institute of Forensic Pathology. In 1995, the police surgeons moved to the Institute from Victoria Police, occasioning the name change. From the outset, the Director of the Institute has also been the Professor of Forensic Medicine at Monash University. Forensic Medicine encompasses forensic pathology, clinical forensic medicine and related sciences, and in Europe, it would extend to forensic psychiatry in some centres. See Appendix 1 for a brief history of the development of the VIFM.

not only several full-time forensic pathologists,[11] but also forensic pathology trainees and part-time anatomical pathologists, including subspecialists from areas such as neuropathology and pediatric pathology.[12] Access is available on-site to photography, radiology (including CT scanning), physical anthropology, forensic odontology, and entomology. Separate laboratories for toxicology, histology, microbiology, and molecular biology are also on-site. The mortuary is staffed by scientists and technicians, with the manager having a Ph.D., which she obtained while working in the mortuary, studying trauma to the cervical spine in road traffic fatalities. Ready access exists to the Forensic Services Department of the Victoria Police, with whom the Institute has a Memorandum of Understanding and the most cordial of relations. This interdisciplinary team-based approach reflects the multiplicity of the fields and the breadth of the knowledge, skills, competencies, experience, and facilities required to provide the comprehensive forensic pathology service expected by the Australian and, it would not be surprising to discover, the Canadian community.

Australia, like Canada, has particular problems with distances separating rural regions from capital cities. Yet there is considerable political and social pressure for the regions to receive services of the same standard as those in the cities. In forensic pathology, this finds expression in the view of communities that the deceased should not be separated from the family and transported to the capital for the medical part of the investigation of the death. Clearly there are cases where family preferences cannot be met (for example, homicides, suspicious deaths, and SIDS—in most states of Australia). Subject to these exceptions, however, it is unlikely that forensic pathology services will ever be completely centralized in major cities, even if it was technically desirable to do so.[13] Thus, there will

[11] Currently 6.3 FTE forensic pathologists are employed at the Victorian Institute of Forensic Medicine.
[12] Our pediatric pathologist, previously the Director of Pathology at the Royal Children's Hospital, has been directly employed by the Victorian Institute of Forensic Medicine (0.4 FTE) since 1990. On 30 June 2007 he retired, and it has proved very difficult to appoint a successor. We have tried over the years to prepare for this eventuality, but the Royal Children's Hospital has had its own challenges in pathology staffing, making it even more problematic to identify an experienced pediatric pathologist who was interested in forensic practice.

[13] Pathologists at the Institute recently agreed that they would do what they could to maintain a rural and regional forensic pathology service from Melbourne. This will involve travel by city-based forensic pathologists into the

always be dependence on clinical/anatomical pathologists in the regions to undertake a range of autopsies referred to coroners because, at least in Australia, there will generally not be sufficient forensic pathologists available to be based in the regions. (This is acceptable, provided there is sufficient support, the quality system arrangements are in place, and the more complex cases, suspicious deaths and homicides, are dealt with by those with the relevant training and experience.) This conclusion is however being sorely tested in Australia as private pathology providers concentrate their increasingly scarce human resources in the capitals, draining the regions of clinical/anatomical pathologists to provide forensic pathology services locally. Capital city–based forensic pathology services with statewide (or in New South Wales, regional[14]) responsibility are now the norm in Australia. It is only in Victoria, however, that the service has a statutory institutional basis.

Pediatric forensic pathology: In what form does it exist?

It is insufficiently appreciated that despite being the public face of pathology, forensic pathology is a very, very small discipline. Of the 2,500 fellows of the Royal College of Pathologists of Australasia, approximately 35 are full-time forensic pathologists, the smallest recognizable grouping within the College. None are full-time pediatric forensic pathologists; Australia, with a population of 20 million people, has no full-time paediatric forensic pathologist.[15] The number of such full-time salaried positions around the world must be perishingly small. In the U.S.A., there are seven pathologists with American Board of Pathology certification in both forensic pathology and pediatric pathology.[16] We do not know if any of those seven occupies a full-time salaried position in pediatric forensic

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country. Subject to the availability of staff, this is a practical possibility in Victoria, which is of relatively small size.

[14] Outside the capital cities, Newcastle (NSW) has a specialist forensic pathology service, as do the Gold Coast and Cairns in Queensland.

[15] There is one pediatric forensic pathologist (Professor Roger Byard) practising in Adelaide, South Australia, half-time as a forensic pathologist (undertaking a full range of forensic pathology work) and half-time as an academic pathologist.

[16] Personal Communication: Betsy D Bennett, Executive Vice President, American Board of Pathology. September 2007.

pathology. We suspect probably not. This simply serves to introduce the thought that there is no separate, operational sub-subdiscipline of pediatric forensic pathology. There is a subset of forensic pathology cases that is properly regarded as pediatric forensic pathology, and that generates a significant academic literature of its own. This organizational aspect, however, is of practical importance as one thinks of ways to support the medico-legal investigation of child deaths.

What it also means, implicit in the title of this paper, is that it does not make much sense to talk about a pediatric forensic pathology service as something separate and distinct from the forensic pathology service. It makes best sense to think of pediatric forensic pathology as an identifiable group of cases, a subset of work, within a forensic pathology operation, institution, or system. The forensic pathology service needs to operate so that all case types with which it deals are evaluated in such a way that reliable results are produced. This includes pediatric forensic pathology. It would only make sense to consider having an operational Pediatric Forensic Pathology Unit undertaking all the pediatric forensic pathology work where:

- it was fully incorporated within the forensic pathology service both administratively and physically;
- there was sufficient work to employ more than one pediatric forensic pathologist so that there is an ability for one to be away, and for there to be review of the work of one pediatric forensic pathologist by the other (This does not necessarily mean two full-time pediatric forensic pathologists.);
- the pediatric forensic pathologists have experience and qualifications in both pediatric and forensic pathology; and
- there was confidence in being able to replace one of these should s/he leave.

From a public policy perspective, the need to develop a tiny elite sub-subspecialty of pediatric forensic pathology can be appreciated. A consequence of such a development would be the de-skilling of

forensic pathology, notwithstanding co-location with the Pediatric Forensic Pathology Unit. This will reduce the scope for quality audit between forensic pathology and pediatric forensic pathology.

Even if it was desirable to do so, the likelihood of being able to meet the above criteria, in anywhere other than the very largest of centres, is slight. Because of the currently small numbers of forensic pathologists, and the tiny numbers of pediatric forensic pathologists, we feel that it would be disadvantageous to the provision of credible forensic pathology services over the longer term to rely totally on a Pediatric Forensic Pathology Unit, even one co-located with a forensic pathology service.

Inherent in the above conclusion is the judgment that, when the full range of pediatric forensic pathology cases are undertaken within a forensic pathology service, pediatric pathology involvement will be able to be arranged, generally speaking, more appropriately than inserting forensic pathology into a pediatric pathology setting. This is a judgment based on both principle and practical considerations.

An autopsy: What is it about?

Forensic pathology is a medical specialty that is part of pathology and is particularly concerned with the investigation of sudden and unexpected deaths from all causes. It is the autopsy-based subdiscipline of pathology concerned with the investigation of deaths where there are medico-legal implications.

The autopsy is at the heart of the forensic pathology service, so it is a convenient starting point. It is generally agreed that an autopsy is a procedure of considerable ethical significance as it interferes with the body.[17] The deceased has usually died very recently, and to all intents and purposes in the minds of his or her relatives and friends, the deceased is still a person. So, while the body of a

[17] See S. Cordner, B. Linehan, M. El Nageh, D. Wells, H. McKelvie, *Ethical Practice in Laboratory Medicine and Forensic Pathology*, WHO Regional Publications, Eastern Mediterranean Series. WHO Regional Office for the Eastern Mediterranean, Alexandria, Egypt, 1999.

deceased person is objectively an inanimate object,[18] it/he/she is imbued with sufficient aspects of personhood to render interference with the body, especially something as substantial as an autopsy, a matter of moral significance. The ethical significance of the autopsy brings with it some consequences that affect the forensic pathology service. These include the obvious: the body should be treated with respect, cared for properly, and not abused. As a corollary, any autopsy to be performed should be properly authorized and be necessary to meet its defined objectives. We believe this moral significance is also such that the community has a right to expect that systems are developed, within legal and resource constraints, and with community input and understanding, to ensure that, if an autopsy is performed, as many as possible of its substantial other benefits are realized.

These obligations can be described in a different way. What a waste, or even a disgrace it would be, to simply perform an autopsy and send a brief report to the coroner, who makes an in-chambers finding that is simply filed with the autopsy report. Despite such a significant thing as an autopsy having taken place, effectively no useful purpose has been served. Families are not informed (beyond perhaps receiving a pro forma sheet of paper in the mail), no reconciliation of the autopsy findings with the questions the family may have is made, no health issues for the family that may be raised by the autopsy are discussed, no implications of a continuing educational kind for the deceased's medical attendants are explored, no opportunities to the relatives to donate tissue from the deceased for transplantation or research are offered, and so on. If all of this, and much more, is possible, and no attempt is made by the autopsy service provider to do any of them, it is fairly easy to conclude that that is not good enough. The autopsy, a procedure that has considerable ethical significance, has been undertaken to satisfy a narrow, one-dimensional purpose: providing "the cause of death" for the coroner.

[18] This is not strictly accurate. Upon death, a person ceases to exist, but parts of what was an integrated functioning human being still live on. Many individual tissues and cells survive death for variable periods; for days in some circumstances. For example, it is the viability of the cells that cover the cornea that determine the success of corneal transplantation. Corneas donated for transplantation can be removed up to six hours after death and are regularly viable at this time. Fibroblasts (cells that make up fibrous tissue) can be cultured post-mortem from dermis (the leathery part of the skin), sometimes a day or more after death.

Some people find it difficult to conceptualize what an autopsy is about: they can't get past the mechanics of its performance to its outcomes[19]. It is quite straightforward, really. The autopsy produces information and represents an opportunity to access human tissue. The value of this is as follows:

- Value to families
  - The identification of diseases with genetic components so that accurate health-care and reproductive advice can be provided, if requested, to close family members.
  - The provision of a factual basis for counselling of relatives, particularly in relation to anxiety that any action or inaction on the relatives' part contributed to the death. (These issues, amongst others that can be resolved at autopsy, commonly do not surface as problems until some time after death.)
- Value to hospitals and clinicians
  - The provision of an accurate cause of death and the characterization of pathology present are essential components of clinical audit (i.e., a process to ensure that illness is being correctly diagnosed and treated).
  - Contribute to the characterization of poorly understood diseases.
  - Evaluation of new medical therapies and new surgical techniques and procedures.
- Value to administration of justice
  - For medico-legal purposes, including the comparison of objective medical evidence with the apparent circumstances of death and the confirmation or establishment of identity (but see also below). These purposes are fundamental to the proper administration of civil and criminal justice systems where the issues to be decided relate to matters of illness, injury, and death. It is in this area that most people see us.

[19] For a full discussion of autopsy procedures, written in plain language, see I. Freckleton and D. Ranson, "The

- Value to public health, including medical education
    - The provision of an accurate cause of death and thus the maintenance of accurate mortality statistics upon which government health policy is based.
    - Investigation of death of vulnerable individuals dying behind closed doors, such as in hospitals or prisons, and therefore contributing to public confidence or otherwise in those institutions.
    - As an early warning system in issues of public health and safety and therefore contributing to the prevention of disease and injury.
    - Contribution to medical and paramedical education.
    - Contribution to medical and paramedical research.

We have set out the above because we believe that a model forensic pathology service would operate in such a way as to enable the valuable uses of autopsy-generated information and access to human tissue to be achieved. Clearly, this Inquiry is concerned in the main with aspects of the functioning of forensic pathology in the criminal justice system, and it is to this that we now turn.

The aims of the forensic autopsy

It is important to appreciate, at the outset, the aims of the forensic autopsy. The aims of this part of a death investigation are:[20]

- To discover, describe, and record all the pathological processes present in the deceased and, where necessary, the identifying characteristics of the deceased.

Autopsy: Medical Issues," chap. 10 in *Death Investigation and the Coroner's Inquest* (Oxford University Press, 2006).

[20] Taken from S. Cordner, B. Linehan, et al., note 17 above, at page 25.

- With knowledge of the medical history and circumstances of the death, to come to conclusions about the cause of death, factors contributing to death, and, where necessary, the identity of the deceased.
- In situations where the circumstances of death are unknown or in question, to apply the autopsy findings and conclusions to the reconstruction of those circumstances. This will, on occasions, involve attendance at the scene of death, preferably with the body in situ.
- To record the positive, and relevant negative, observations and findings in such a way as to enable another forensic pathologist at another time to independently come to his or her own conclusions about the case. As forensic pathology is essentially a visual exercise, this involves a dependence on good quality, and preferably colour, photographs.

The autopsy will have been wasted unless, in accordance with applicable law and mindful of ethical concerns, its results are communicated in understandable terms to those who need them.

Encapsulated in this approach to the forensic autopsy are two consequences at odds with a common perception of the specialty. Firstly, as Plunkett has observed,[21] forensic pathology could be regarded as the "what happened," and not the "whodunnit," specialty. It is as part of this that the pathologist is concerned with coming to the best conclusion about the cause of death. However, and this is the second consequence, in pursuit of answers to "what happened," conclusions about the cause of other findings on or in the body, or at the scene, or of events described in witness statements, may require the pathologist to attribute "cause" in areas other than the cause of death.[22] Provided the pathologist keeps to his or her expertise, this is quite proper.

[21] J. Plunkett, "Shaken Baby Syndrome and the Death of Matthew Eappen" (1999) 21(1) *Am .J. For. Med. Path* 20.

[22] This is not a reference to attributing cause of death to a particular person. There are other aspects of cases that require the pathologist to make causal conclusions. For example, how one of a number of injuries was caused; whether a particular injury was caused by one or other of two implements of concern in the case; where at the scene was a particular injury likely to have been caused; the cause of existing scars; whether a particular injury was the result of an inflicted blow or an accidental cause.

3. A Model Forensic Pathology Service: Credibility

Its high profile does not mean that there is a good understanding of forensic pathology. It has no tangible product—it produces observations and opinions whose value is proportional to the credibility of those making them. The forensic pathology service is nothing; its contribution cannot be made, if its practitioners do not have a reputation for credibility with those who depend upon it. When the government funds a model forensic pathology service, it wants, and the community needs, a credible service.[23]

How does a forensic pathology service achieve this credibility? It is not something that can just be demanded and given. The credibility of a service is related to the trust in the service as well as obvious adherence by the service to standards. Such standards include appropriate and contemporary facilities and sufficient staff who are properly educated and trained, and who perform ethically, efficiently, and effectively. What then are the practical corollaries of this: how does a service establish and maintain credibility?

It starts with the education and training of forensic pathologists.

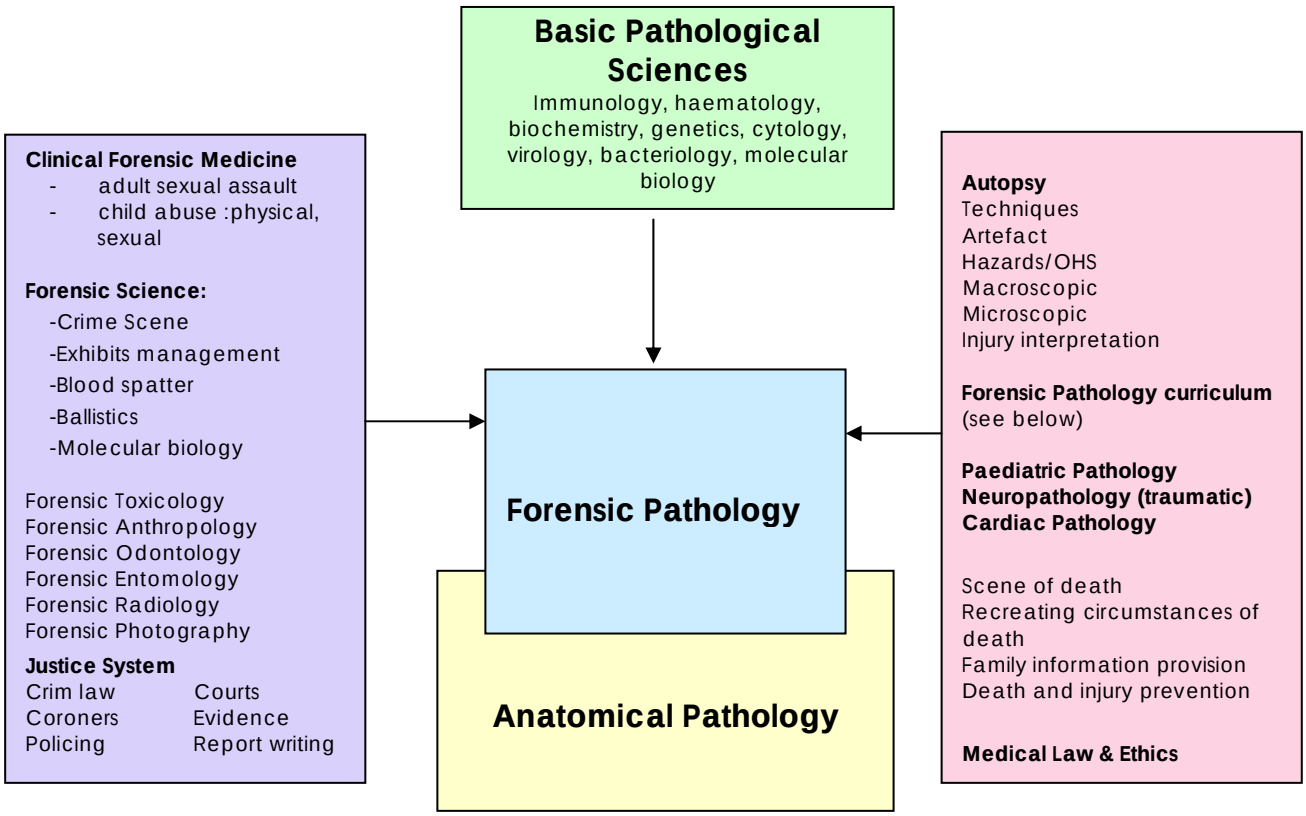
Education and training of forensic pathologists

Forensic pathologists are recruited from the medical profession, generally from among pathology specialists who practise in the field of clinical pathology, particularly in anatomical pathology or histopathology. Specific training programs in forensic pathology have existed for some years in the U.K., Australia, and the United States.

[23] Clearly the credibility has to be a justified credibility. Unjustified credibility is simply a fraud.

Consider for a moment the core of a forensic pathology-training program.[24] Such training would be applied to a medical graduate who has gained some post-graduate clinical experience before entering a pathology-training program.[25] During, or perhaps after, this program, the trainee decides to become a forensic pathologist. What follows is, in general, the sort of knowledge that such a trainee in the developed world would be expected to acquire.

Content of forensic pathology training



The complete curriculum for the training program in forensic pathology of the Royal College of Pathologists of Australasia is attached as Appendix 3.

[24] If there is any doubt about the centrality of forensic pathology to death investigation, then consideration of the education and training required should dispel it.
[25] In the developed world, most specialty medical training is supervised, "on the job" apprenticeship training, supplemented by considerable theoretical learning, much of it self-directed, with both formative and summative assessment (otherwise known as continual assessment and examinations respectively).

As the above also demonstrates, any training of forensic pathologists must incorporate the techniques and skills of clinical pathology, in particular anatomical pathology: morbid anatomy and histopathology. A period of further study will equip a clinical pathologist with the factual knowledge required to deal with the forensic medical and scientific investigative aspects of the work of a forensic pathologist. However, the development of the necessary legal skills is more difficult. In the past, the majority of forensic pathologists gained these skills by experience. The very act of taking part in complex police investigations and in court processes within the coronial and criminal legal systems provides forensic pathologists with an insight into the legal investigative process and the evidential requirements of the legal system. In addition, such experience provides a pathologist with the opportunity for self-reflection regarding his or her own style and interaction with the legal system. The pathologist can also reflect upon his/her approach to the delivery of oral testimony, and over time, s/he may become an effective expert witness. As can be gathered, probably too much is left to chance.

A model forensic pathology service is completely reliant upon an effective system of post-graduate forensic pathology education and training. The model service will be an important component of the whole country's effort in this regard, and, if in the largest jurisdiction, should be the leader.

Teaching and research

In most parts of the developed world, there is a very close connection between clinical medicine services in major hospitals, and academic or university-based teaching and research. Service provision is informed by the intellectual rigour of research and teaching within a university framework, and the research and teaching is informed by the reality of service provision. The strongest parts of clinical medicine are those parts most strongly represented in the structures of the major university hospitals. Credibility in forensic pathology is likewise. A forensic pathology service required to teach and

research will more likely be a forensic pathology service that keeps up to date and is intellectually alert.

Historically, maintaining and developing knowledge has been difficult to achieve because the imperatives of service work often overwhelm and take priority over what is seen as the expendable side of the institution's work: teaching and research. An obligation for the staff of a model forensic pathology service to engage in teaching and research cannot be seen as optional. It is an essential part of the service's mission, enabling it to support the justice system. Graduates of the newer medical courses are well attuned to the mix of teaching and research with service, as they have been immersed in the culture of medicine as a pursuit of "lifelong learning." The model forensic pathology service needs to reflect this new cultural reality in medicine, or the service will not only inevitably lose whatever credibility it is fortunate enough to start with, but will also struggle to attract the good trainees and young forensic pathologists in the first place. Engagement with research will also transmit to the courts and the wider community a serious commitment to improving the knowledge base of the discipline. As has been set out in the companion paper "Pediatric Forensic Pathology: Limits and Controversies," this is needed in forensic pathology.

The teaching and research function does not mean that the model forensic pathology service needs to be situated completely within the university sector. The analogy, as mentioned above, is with hospital-based university departments. The model forensic pathology service is a self-sufficient, purpose-designed service institution, with teaching and research obligations, which also has a presence within the university sector.

Appropriate and contemporary facilities

Having properly trained staff to provide services and a system that requires research, teaching, and continuous learning, the model service needs to turn its attention to the physical environment. This should reflect the duty of the model service to care for the deceased properly. The atmosphere should

be reminiscent of a hospital. The facility should be clean and, to the greatest extent possible, odour free. Would a photograph of the interior of the mortuary and its ancillary facilities—minus of course any bodies[26]—withstand the public scrutiny of publication in the main daily newspaper? The likelihood is that a facility more than 20 years old will not pass these tests. Mortuaries are subject to industrial-level usage, especially with the amount of water they are exposed to on a daily basis as part of attempts to keep them clean. This usually results, after some years, in a deteriorating building fabric, making maintenance uneconomic and more difficult.

In addition, over the last 20 years, the complexity of medico-legal death investigations, including autopsies, has increased substantially. (See Appendix 4.) The expectations of all the stakeholders (families, courts, medical attendants, coroners, police—to name but some), administrative and legal imperatives, and the intellectual and technological developments in medicine and pathology, have all interacted to result in a medico-legal death investigation quite different to that of the mid-1980s. This has considerable impact upon the design and layout of the facility necessary to meet contemporary standards.

The mortuary layout should also reflect the operational model that has been decided upon. This model needs to be forward looking, accommodating new technology and the increasing numbers of deceased persons. The operational model will need to be mindful of the shortage, and high cost, of forensic pathologists, which are likely to remain factors in service provision for some time. Accordingly, the model needs to make the most efficient use of their reduced availability. Technology and staff support needs to be available, and activity that can be devolved to others, should be. Mortuary storage needs to be able to accommodate a disaster of at least modest to moderate scale,

[26] This is not a facetious comment. How the mortuary protects the privacy and modesty of those in its care will be an important marker of institutional culture and a contributor to its reputation. At the VIFM, the test for whether any one person can visit the mortuary and/or observe an autopsy is whether or not that visit or observation is necessary. Clearly, medical students need to be able to see an autopsy, as do medical attendants of the deceased during life. There are non-medical people who can meet this test too; for example, a barrister about to defend a person charged with murder where the autopsy-derived medical evidence is crucial. Setting the rules here is a useful function for the Ethics Committee of the forensic pathology service, which will have lay representation. This should help keep the service in touch with community sentiment and expectations.

without impacting upon daily operations. Occupational health and safety considerations for staff will be a critical consideration, especially in the way bodies are stored (as bodies are removed from storage on an average of six times during their stay at the VIFM) and examinations conducted. There will be increasing dependence on IT support before, during, and after the performance of the autopsy. Earlier receipt of more and higher quality information from the scene will assist the timely disposition of cases that is an ever-present pressure upon forensic pathology services. Contemporaneous transcription of reports so that interim reports are available upon the pathologist leaving the mortuary, in numbers of cases, is likely to develop. Likewise, greater use of imaging, including CT (computerized tomography) and photography, will occur as the independent reviewability of all cases, not just obvious homicides, assumes greater prominence. Separate and adequate space for special examination types such as skeletal remains, infectious cases, homicides, infant deaths, and others will need to be planned. The ability for easy interaction with the increasing administrative elements associated with autopsies will need to be designed into the facility.

The model facility should include, inter alia:

- associated laboratories such as toxicology, histology, microbiology, molecular biology;
- video-conferencing with clinical pathologists, and perhaps others, in regional centres;
- lecture facilities for undergraduate and post-graduate students, and many other groups who will have a proper academic and other interest in the model forensic pathology service;
- space for research and teaching staff, trainees;
- library;
- contemporary dedicated in-house IT capacity;
- cafeteria/staff room;
- administrative facilities;
- adequate storage space for records and exhibits not stored by police (mainly of biological origin); and

- proper offices for police and others (including families) associated with the investigation of particular cases who may need to attend for a number of reasons.

The model forensic pathology service will operate from a model facility. This will be an important factor in attracting and holding the high-quality staff that will establish, underpin, and entrench the credibility of the service. It would make sense for the model forensic pathology service to share the facility with one or other of its key stakeholders. This could be the coroner, or it could be a facility that is on a major hospital campus to optimize the continuous learning of the staff (including the staff of the hospital as well). This choice will depend upon the division of responsibilities with the coroner. In Melbourne, we have been extremely well served sharing the building with the State Coroner. At times we have felt a little distant from advances in medicine by not being on a hospital campus, but on balance the conclusion is clear: in the Victorian context, co-location with the State Coroner has been an important part of the strength of both the State Coroner and the VIFM individually and collectively.

Reliability—The product of a credible service

The model forensic pathology service produces reliable results.[27] This starts with properly educated staff, imbued with the values of the model service, including the importance of research, teaching, and continuing education. This is not only the pathology staff, but also the scientific and technical staff. These staff work in a model facility. But more is needed to produce reliable results.

What is also needed is a quality management system. An institutional framework, with professional leadership and the willing participation of a team of peers, is necessary to effectively administer and maintain a system of quality assurance. The approach is designed to build credibility through reliability. These are reasonably fragile commodities or characteristics. They have to be

[27] Reliable results are the same or similar results reproduced from the same materials by equivalent professionals.

buttressed by a formal quality management system. Such a system includes accreditation: the development of written industry-wide standards, implemented within the institution in writing via manuals, standard operating procedures, and other controlled documents, and the institution's adherence to those standards being formally and externally audited. The audit would include undertakings made, in accordance with the industry-wide standard, in relation to the provision of continuing education for staff, and their attendance and participation in it, for example.

What are the elements of the VIFM quality management system, particularly as it relates to our pathology operations?

- document control (the VIFM document control system contains 1,147 documents including forms[28]);
- policies and procedures; standard operating procedures;
- accreditation by the National Association of Testing Authorities (NATA), Australia's laboratory-accrediting authority with respect to medical testing and forensic science;
- system of ongoing internal audits: e.g., administrative case review; technical case review[29];
- weekly pathology case review meeting;
- weekly Institute meeting;
- pathologists accompanied to court twice a year by another pathologist;
- continuing medical education entitlements in contract of employment;
- requirement to participate in Quality Assurance Programs (QAPs) in position description, as is teaching and research;
- Continuous Improvement Request Corrective Action (CIRCA) system[30] as part of approach to continuous improvement; and

[28] Not all relate to specific forensic pathology functions; many are concerned with related laboratory functions as well as general Institute administration.
[29] See Appendix 5: Technical Quality Review of Forensic Cases.
[30] The CIRCA system is an electronic recording system of all observations submitted by staff, stakeholders, or the public, whether near-misses, failures, criticisms, or praise, and their follow-up. The system is available to

- presentation of evidence in open court; subject to cross-examination.

These elements are accompanied by a cultural attribute that promotes quality: a team approach to work in the autopsy suite and in the model service generally, which promotes the likelihood of another pathologist viewing the case and discussing the findings with their colleagues.

For a number of years now, VIFM has published its minimum standards.[31] These are not perfect, and need development, but they are what we say we do as a minimum in particular case types. This maximizes professional autonomy while representing a standard below, which we must not fall. While uniform codes of practice for certain types of cases can be very useful (for example, the National SIDS Autopsy Protocol in Australia) they only take you so far. A "painting by numbers" or a checklist style of examination and reporting has the attraction of indicating completeness, but does not replace rational professional judgment about the conclusions that are justified in the particular case. It is difficult to create standards for conclusions. The completion of such written codes risks becoming the de facto test of competence at the expense of the more difficult, but more important, assessment of the quality of the observations and conclusions. We anticipate that the number and extent of such guidelines will increase in coming years, and while they represent useful contributions generally, they are a less powerful tool for assuring competence and excellence than high-standard training, continuing professional development, and a commitment to other quality assurance processes, including peer review.

Peer review includes the collegiality of the working environment. It is possible for a forensic pathologist to practise in an isolated manner in a group setting if his/her tendency to prefer his/her own company is allowed to develop unchallenged. Peer review includes a willingness to participate in the weekly case review meetings. Participation involves attendance, presentation of cases, and a

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accrediting and auditing agencies, and is overseen by the Quality Review Committee, which is the Director, the Head of Forensic and Scientific Services, Head of Corporate Services and the Manager, Quality and Organisational Development. Its limiting factor is a cultural one: the extent to which the staff are prepared to use it.

[31] www.vifm.org.

willingness to join in discussion when other cases are presented. The formal part of peer review involves the Technical Quality Review of Forensic Cases (see Appendix 5). It will be noted that the pathologist undertaking the review certifies that

> [i]n my opinion, the critical observations/findings in this case are independently reviewable and the conclusions based upon them are reasonable. (This does not mean that the reviewer necessarily endorses the conclusions.)

It might be asked why the certification avoids saying that the reviewer agrees with the conclusions. There is no reason in principle why this could not be included in a review. The amount of work involved for the reviewing pathologist to reach this point is such that it could not reasonably be done in the context of workloads at the VIFM. In addition, it would need to be understood that agreement at the point of signing the report may not constitute agreement as probing and questioning digs deeper into the issues of the case, or as new information becomes available.

There is, in the model forensic pathology service, a continuing exposure on a very regular basis, even daily, to relevant learning. This is called continuing medical education (CME) or continuous professional development (CPD). Typically this includes multidisciplinary case reviews, discussions, more formal case presentations, topic reviews, journal article presentations, team involvement in QAPs, discussions around the multi-headed microscope (or high-resolution projections), attendance, participation, and presentation at relevant meetings and conferences. Obligations to participate in CME are part of the position description for all pathologists in the model service, and time is set aside and funds are earmarked to facilitate this. The Royal College of Pathologists of Australasia requires participation in CPD totalling 400 hours over five years. This is randomly audited by the College. This is easily achieved by pathologists at the VIFM participating in the activities listed above.

Reviewing the work of others is a form of quality control, but it is also a form of quality assurance and, more particularly, continuing professional development. Reviewability (that is, the ability of the autopsy to be reviewed at another time and place by another pathologist so that s/he can come to his/her own conclusions) is increasingly recognized as an essential aim of the autopsy. There needs to be more standardization between institutions and jurisdictions as to what constitutes a satisfactorily reviewable autopsy. This will vary from case type to case type. Similarly, data collection procedures should be explicit and contain sufficient written clarification for the ambiguous situation or commonly experienced difficulties. Data should be checked for completeness and accuracy.

Concluding the cause and circumstances of death—A shared understanding

A credible forensic pathology service will have forensic pathologists who understand the approach to concluding the cause and circumstances of death. While this will be part of the education and training of the forensic pathologist, it will be a key component of the continuing education of the forensic pathology staff. The importance of this is encapsulated in one of the fundamental obligations of the forensic pathologist:

> The forensic pathologist's broad duty is to make sure that the cause and circumstances of the death are revealed and not to collude in wrongly hiding or obscuring these.[32]

This might seem obvious to some. To many, however, there are a couple of surprises in this statement. It is insufficiently appreciated that pathologists are concerned with more than concluding the cause of death. Pathologists are also intimately involved in evaluating the circumstances in which the death

[32] See note 19 at p28–29.

occurred.[33] Apart from being valuable in itself, this is critical in very many cases to conclude properly the cause of death.

However, concluding the cause of death is certainly a fundamental responsibility for all forensic pathologists. Yet very little has been written about the criteria that need to be satisfied to make a decision. Leaving aside the minority of cases where the lesion observed at autopsy is incompatible with life (e.g., decapitation),[34] what in fact usually happens in coming to a conclusion in particular cases is that ***a*** cause of death discovered at autopsy, which accords with the medical history and circumstances, is elevated to ***the*** cause of death. In general terms, the pathologist makes a decision or concludes that a certain autopsy finding, or combination of findings, is capable of causing death, and that this is consistent with the deceased's medical history and circumstances of death. A conclusion about the cause of death is, obviously, retrospective and generally cannot be tested. This diagnostic exercise is quite different to diagnosis in clinical medicine. This understanding emphasizes:

- the need to discover all the pathological processes present in the deceased before considering them in relation to the best available information about the medical history and the circumstances of death; and
- the need for circumstantial information of sufficient quantity and quality upon which to base the conclusions about the cause of death.

The corollary of the above is that if there are no findings capable of causing death and/or the information about the circumstances is not known, uncertain, or in dispute, then it is easy to see that problems can arise. For many forensic pathologists, all of this encapsulates the fascination of the discipline, but clearly it is also its vulnerability. Many people find the reliance of forensic pathology

[33] Some have referred to forensic pathology as the "what happened" specialty, not the "whodunnit" specialty.
[34] Even this exercise is poorly understood, with most people thinking the cause of death is a finding incompatible with life that will be revealed by a careful autopsy. This is true in perhaps 5–10% of forensic autopsies in Australia.

upon information about the circumstances to be puzzling. Take the following example for the purposes of discussion:

> Baby A was 3 months old and left in the care of a local authority nursery. It was cold, windy and snow was on the ground. She was left outside in an uncovered pram unattended for 3 hours. When she was fetched in, it was found that she was dead. There were no significant pathological findings at autopsy.[35]

The definition of the Sudden Infant Death Syndrome (SIDS) is the sudden, unexpected death of an infant during a period of supposed sleep in whom a thorough autopsy and review of the medical history, scene, and circumstances of the death fails to find any adequate cause for the death.[36] The absence of any pathological findings in the case above puts this death in the category where SIDS would be considered, subject to a review of the medical history, scene, and the circumstances. It also needs to be understood that death from exposure (or, more technically in these circumstances, hypothermia—low body temperature) may also have no pathological findings. Clearly, the circumstances of the death in this case, having been left outside in the wind on a freezing cold day, mean that hypothermia will have to be considered as a cause of death.

One approach would be for the pathologist to conclude that the cause of death is "unascertained," and then to discuss in his/her report the extent to which the exposure may have been involved in this death by a consideration of the circumstances. Another pathologist may conclude that the cause of death is indeed "hypothermia" or is "consistent with hypothermia." There may have been information that only surfaced months after the death that in fact the nurse at the nursery took the baby's temperature soon after she was brought inside, and it was 28 degrees Celsius. (Normal body temperature is 37 degrees Celsius.) This observation might be regarded as supporting death from hypothermia, but as a matter of fact cannot exclude death from some other undiscovered natural cause

[35] Also called a negative autopsy.
[36] H.F. Krous et al., "Sudden Infant Death Syndrome and Unclassified Sudden Infant Deaths: A Definitional and Diagnostic Approach" (2004) 114(1) *Pediatrics* 234–8.

soon after being left outside, and the drop in temperature simply represented cooling after death in a cold, windy environment. The different possible causes of death are briefly discussed in Table 2 below.

Table 2—Different causes of death following a negative autopsy in a three-month-old baby left outside in a pram for three hours on a freezing cold and windy day

Cause of Death	Comments
Sudden Infant Death Syndrome	No. Hypothermia as a realistic possibility, based solely on the circumstances of the death, excludes a diagnosis of SIDS.
Hypothermia	The pathologist's opinion is that the cause of death is hypothermia. In his/her experience, the circumstances are such that hypothermia could explain the death, and in the absence of any competing cause of death, s/he believes it is reasonable to conclude that hypothermia indeed caused the death.
Consistent with hypothermia	As above, except that the pathologist believes that other, perhaps slight, possibilities cannot be excluded. For example, the baby might have had an underlying cardiac arrhythmia (e.g., long QT syndrome, or similar) that manifested itself when the baby was put in a stressful situation, or manifested itself spontaneously within minutes of the baby being left outside.
Unascertained (Undetermined, or similar word)	The pathologist is not sufficiently confident that the circumstances can be held responsible for the death, because s/he is slightly surprised that even though the pram was uncovered, the baby was well wrapped, and was several inches below the upper level of the pram such that the worst effect of the wind would not have been felt. The other slight possibilities assume greater significance in this pathologist's mind, and while hypothermia is discussed in the report as a possible or even likely cause of death, in the end the pathologist's opinion is that s/he cannot say.
1 (a) Unascertained in an infant left outside in a pram on a very cold day	Very similar to 1 (a) Unascertained, except that the pathologist wants to indicate formally that s/he believes the circumstances of being left out in the cold are implicated in the death.

Certainty in concluding a cause of death

A question often surfaces about the degree of certainty that needs to exist in a pathologist's mind before s/he concludes the cause of death. As reasonable a question as this is, it is not the right question. It is a perfectly understandable question from the legal paradigm: lawyers want to know how certain someone is because of the legal burden and quantum of proof in criminal and child welfare cases. But it is also a question that stems from the thought that any particular cause of death is a fact. As mentioned above, this is true in perhaps 5–10% of cases where the autopsy finding is incompatible with life. The other 90–95% involve interpretation and judgment. The judgment is, by its nature, not ascertainable as a fact, and therefore it would seem inappropriate to assign a level of certainty. Consider the following: A man is seen to lie down on the rail tracks, and remain still until he is run over shortly after by a train. The pathologist describes the subsequent decapitation and also the severe coronary atherosclerosis that is present. Toxicology analysis reveals low levels of antidepressant medication. The pathologist is informed of what was seen, as above, and also of a report from the deceased's medical practitioner that the deceased was being treated for depression, and had discussed the taking of his own life. There was no specific medical history of heart disease. The cause of death was given as "Decapitation by train."[37] In the circumstances, there is really no doubt at all about the immediate cause of this man's death. It is a fact. It is certain.[38]

In the other 90% of cases, as we have seen, there is exercise of considerable judgment by the pathologist in concluding the cause of death (or more correctly, the "cause of death" statement). It seems to us, in coming to this judgment and phrasing it carefully, the pathologist might ask him/herself not: "How certain am I about this judgment?" but: "Do I believe this judgment to be true?"

[37] We will leave to one side here any discussion about whether the cause of death is more accurately described as "Decapitation" or "Suicidal decapitation by train," or "Decapitation by train in a man with suicidal ideation undergoing treatment for depression."

[38] Well, almost. No pathologist could tell if, some seconds before he was run over by the train, in fact he died from his severe coronary atherosclerosis, which was of a degree capable of causing sudden unexpected death, especially given the immense stress he must have been under. We all assume that because he was seen to lie down on the tracks that he was alive when he was run over. The autopsy will probably not be able to distinguish between the two situations. In addition we are assuming—and there is no real reason not to—the truthfulness of the eyewitness (usually the train driver) whose story of what happened in the seconds before death we are relying upon.

In believing it to be true, s/he will be able to defend it, and the reasons will be evaluated in assessing whether the judgment should be agreed with. It being a true statement, it will convey within it the potential for other possibilities. A particularly careful cause of death statement in the train example above might be phrased: “Decapitation by train in a man with severe coronary atherosclerosis.” This phraseology captures the remote possibility of death having occurred in the seconds after lying on the tracks but before being run over by the train. (In these circumstances, few forensic pathologists would actually go to the lengths of including the coronary atherosclerosis in the cause of death.) The validity of the judgment or conclusion is tested by whether a respectable body of peers would endorse it as reasonable, not necessarily agree with it. The necessity for the conclusion about the cause of death to be true means that as the issues become harder or more controversial (in the sense that there are multiple incompatible competing causes), or the entity is more elusive, the conclusion will become more general and less particular or prescriptive. (The interested reader might like to consult the section “Concluding the Cause of Death” in the companion paper “Pediatric Forensic Pathology: Limits and Controversies.”

Workloads

The model forensic pathology service will command the respect of its staff and can reasonably expect high levels of performance, being in a leadership position in the discipline. In return, the model service should observe the norms of reasonable workloads. (This has proved an elusive goal at the VIFM.)[39] Considerable work has been done in the U.K., U.S., and Australia about workloads. It is difficult to be completely prescriptive because it is dependent upon what is actually done. All the reviews mentioned, however, recognize the importance of participation in CME (which includes teaching and research). Indeed the contract for all medical specialists in the National Health Service (NHS) in the U.K.

[39] See Appendix 6 for details of forensic pathology and related scientific service workloads over the past six years.

recognizes that 30% of the specialist's time should be devoted to CME. The NHS sees this as a necessary investment in quality, both of the service and of the working environment for its high-value staff.

Without going into great detail, broadly speaking, the following statements about casework are true.

Recommended caseload—United States

The National Association of Medical Examiners (NAME) has studied staffing requirements and workload capabilities for medico-legal officers and forensic pathologists. NAME's 2003 accreditation checklist indicates that a forensic pathologist who has no administrative duties should perform no more than 250 autopsies per year. According to the *Status and Needs of Forensic Science Service Providers—A Report to* Congress, published by the National Institute of Justice in March 2006,[40] NAME considers that when the number of autopsies exceeds 350 per year, mistakes are more likely to be significant and involve errors of judgment.

Recommended caseload—United Kingdom

The British Association of Forensic Medicine (BAFM) concluded in 2005 that the full workload for a forensic pathologist is about 60 suspicious deaths a year, based on 70% of time for caseload and 30% of time for continuing professional development and quality-related activities. This was accepted by the Home Office as the basis of fees payable, accepting as a reasonable salary GBP 120,000 per annum (pa) in 2005. (It should be appreciated that this is a " virtual" workload to calculate a fee payable. As far as we are aware there is no single forensic pathologist in England and Wales whose sole yearly work is 60 suspicious death autopsies. It is instructive however as an indication that,

[40] http://www.ojp.usdoj.gov/nij/pubs-sum/213420.htm.

properly done, a suspicious death case—which is taken to include homicides and those other deaths in which police have an interest—represents about 4 days work on average to the Home Office.

Caseload—Australia

At the Victorian Institute of Forensic Medicine in 1999/2000 there was a workload of 380 autopsies per FTE forensic pathologist. This has risen to 650 medico-legal death investigations (MLDIs) per FTE forensic pathologist in 2006/07, comprising 390 autopsies and 260 external examinations with reports. The high number of external examinations represents one means of managing increased demand. VIFM regards an external examination as representing on average 40% of the work of a full autopsy. This means that in 2006/07 each FTE pathologist undertook 494 effective full autopsies. In 2007/08 this will rise to well over 500 if current trends continue.

More recently, in an as yet unpublished paper for the Australian Health Ministers Advisory Council, a survey of forensic pathologist practices around Australia indicated ratios of full autopsies to FTE forensic pathologists from 221 to 440.6.

Based on the international experience, and the work reported in the as yet unpublished paper, an indicative caseload of 250–300 autopsies or an equivalent number of MLDIs (e.g., 200 autopsies and 150 external examinations with reports) was proposed for the purposes of forensic pathology workforce planning. This benchmark indicates that some Australian forensic pathologists, including those at the VIFM, are managing very high workloads, which potentially operate as a disincentive to enter, or remain in, the forensic pathology workforce. Speaking for VIFM, we can say that the high loads are not sustainable, are a threat to quality, and weaken our ability to retain staff in a competitive environment driven by shortages in all jurisdictions. These loads flow on to other parts of the organization, including the mortuary and all laboratories. The model forensic pathology service would have in place agreements with government to tie budget to workloads and to innovative strategies to deal with workload demand.

Whether caseloads go up or down over time depends upon the jurisdiction. In Auckland, New Zealand, numbers are apparently dropping, as coroners, increasingly sensitive to Maori objection to autopsy, are requiring fewer of them. In Melbourne, the total case numbers are going up quite sharply (strong population growth; increasing tendency for doctors to report deaths to the coroner; country pathology services closing, meaning the cases are referred to Melbourne; Registrar of Births, Deaths and Marriages now refers cases for investigation which on the face of the death certificate should have been reported, but were not). With the increased reliance upon external examinations, the total work has increased quite substantially, with the actual number of autopsies remaining relatively static.

Accountability of the model forensic pathology service

The model forensic pathology service is both responsible and accountable for its operations. All forensic pathology services are responsible for their service, but relatively few are accountable. Accountability often operates at the level of the individual pathologist through the regulatory regimes for medical practitioners generally. The service itself, at least in the coronial systems, with which we have familiarity, is often not accountable. There can be confusion about responsibility and accountability. They are distinct concepts. Both are required, and need to be understood by the service, to maximize the chances of the service organizing itself around the possibility of failure.

The accountability of the model forensic pathology service will be built in at its establishment. If the service is established by legislation as an independent corporate body with a representative governing council and ultimate responsibility to Parliament, even greater gains are made in establishing public trust and confidence.[41] This legislative approach promotes accountability and transparency of operations:

- The powers, functions, and duties of the organization are set out in legislation.
- The organization must report on its operations through its governing council to the responsible Minister and thence to Parliament.
- As a corporate body, it can sue and be sued.
- Any adverse events will be scrutinized in a political environment (and are often highly charged), and this provides a direct incentive for procedural changes to prevent such an event being repeated.
- Relationships with other players in the field such as universities, police, coroners, and community health-care workers are forged at an organizational level and as such dilute the influence of individual personalities and proclivities.
- As an independent statutory authority, medical and scientific investigation of identity, cause, and circumstances of death can be conducted at arm's length from the coroner, police, and legal profession.
- There are opportunities for development of procedures, policy, research, and review of practices.
- There is an organization, preferably in a purpose-built building, with which members of the public can interact directly.

Although we indicated at the beginning of this paper that we were not undertaking a comparison or critique of different death investigation systems, the authors can be counted as supporters of Victoria's coroners' system. It is good that there is someone other than the pathology service itself authorizing the autopsy and to whom the forensic pathology service is independently accountable for its autopsy outputs. (The model forensic pathology service is accountable in a number of ways. This particular accountability operates in the sense that the autopsy is directed to be performed by the

[41] This approach is to be contrasted, for example, to contractual arrangements for the provision of services made by the responsible coroner, police force, or government department with groups of forensic pathologists in the

coroner, and it is to the coroner, in every case, that the report is provided. It is the coroner who ultimately makes findings in the cases, and theoretically, s/he can criticize the model forensic pathology service for some aspect of the particular autopsy, or the service generally. What concerns many forensic pathologists is that, as coroners are not forensic pathologists, they should not become involved in deciding how the model forensic pathology service undertakes it work. Coroners are the initiators of the work and in many cases, the key consumer of its results.) It is good that we have a system of inquests—a public accounting of deaths where families can ask questions of concern not answered in criminal or civil proceedings, and where matters of public interest can be explored. The absence of these features is, as we see it, the main weakness of the usual medical examiner system. The weakness of our coroners' system is how it deals with those 80–90% of cases where there is no inquest. These deaths are better conceived of generally as health-care issues and dealt with in that manner. A model forensic pathology service would deliver a health-care-led approach in these cases and could do this within a flexible coroners' system to which it would remain accountable.

Be that as it may, in terms of dealing with individual cases, the model forensic pathology service is accountable to whatever system it sits within. This could be a system with a coroner, medical examiner, or judge initiating the work of the model forensic pathology service and being the primary receiver of its results. In addition, the criminal courts will hold the individual pathologist to account in individual cases. Every time a forensic pathologist steps into the witness box, his/her reputation is at stake, and there are few whose pulse does not quicken when they testify. Upset families are a very potent form of informal accountability, as are police. So, in relation to individual cases, there is usually quite a high degree of accountability. Staff from the model forensic pathology service understands this and are happy to work with it. Finally, as mentioned above, individual pathologists are accountable to the Medical Board (or whatever name is given to the licensing and governing authority for medical doctors). Such Boards often have quite wide power to oversee the professional

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private sector.

behaviour of registered medical practitioners. All of this oversight tends to be reactive, not proactive, and may not prevent poor performance from occurring in the first place.

This limitation of the effectiveness of individual professional accountability emphasizes the importance of the institutional environment of the individual pathologist; institutional accountability will also be key to developing and maintaining credibility. The VIFM's institutional accountability operates in relation to the content of its forensic operations as well as its administration. The former is exemplified by the presence on the Council of judicial officers from the three tiers of the courts. Currently, the Chief Justice of Victoria is the Chair of the Institute's Council. She followed in the footsteps of the previous Chief Justice. It has been of enormous benefit to the Institute that the judiciary has taken this level of interest. No one could, on theoretical grounds, be critical of a judge for not wanting to take the risk of membership of a governing council, especially one overseeing as contentious an area as ours. But clearly the judiciary has a great interest in ensuring that the work we do is of good quality as the reputation of the justice system to some extent relies on it.

The Institute's Business Plan (and its Corporate Governance Manual) for some years now has included the following under the section entitled "Accountability":

> The basic accountability mechanism at the VIFM is the fact that the Director is responsible and accountable to a Council, which represents the main users. The performance of the Institute can therefore be adjusted to meet the needs of users. For example, if the Coroner or the Chief Commissioner of Police has a problem with an aspect of service delivery that s/he cannot resolve satisfactorily, this can then be raised as a Council matter.

The elements of accountability can be summarized as follows:

- Governor in Council appoints Council members and the Chair of the Council, on the recommendation of the Attorney-General and other ministers and institutions represented on the Council.[42]
- The Director and State Coroner are ex-officio members of the Council.
- The Council sets the primary framework (the strategic and business plans, receives and considers reports from its Audit committee, its Executive and Finance Committee, its Ethics Committee), and it is the body to which the Director is ultimately accountable for the day-to-day affairs of the Institute.
- The Director, as Professor of Forensic Medicine, also reports to the Dean of the Faculty of Medicine, Nursing and Health Sciences at Monash University in relation to the academic components of the Institute's life.
- As an appointee of Monash University, the Director is independent of the public service, and while he deals very regularly with the Department of Justice, he is not personally or directly accountable to the Department.
- The Institute accounts to the Department of Justice in its Annual Report on its budget and expenditure.
- Council approves an Annual Report to the Attorney-General who tables it in Parliament.

Relationship between the model forensic pathology service and its pathologists

[42] Ministries represented are: Attorney General (two representatives, one of whom must be a pathologist); Police and Emergency Services; Health; Community Services; Women's Affairs. The Chief Commissioner of Police is represented. The Councils of both Monash University and the University of Melbourne are each represented, in each case, by the Dean of the Faculty of Medicine. The Chief Justice has a representative. The Attorney-General appoints the Chair. There are good arguments for including representatives of the Director of Public Prosecutions and possibly also the Bar Council (or its equivalent). The size of the Council needs to be manageable. A challenge for the VIFM has been having sufficient people on its high-level Council with the knowledge, skills, and time to serve on the various subcommittees.

This is a fascinating issue. The analogue is the relationship between a hospital and its consultant medical staff (medical specialists). The tension there is between the corporate aims of the hospital and its desire to have the consultants aligned with these, and the consultants' personal obligations to patients. It is easy to imagine dilemmas arising for consultant medical staff in a hospital setting relating to the allocation of resources. How much, so the issue could be epitomized, will the consultant's defence of "acting under orders" serve to protect him or her ethically?

In relation to forensic pathologists, the issue is in sharpest relief in relation to the giving of evidence. It is insufficiently appreciated that the law regards the witness as an individual person, not the representative of an institution. The model forensic pathology service has a reputation for credibility, but in the particular case, the opinion evidence given is that of the individual pathologist. The role of the institution is, as far as possible, to ensure that

- appropriately qualified people are appointed;
- the facility is up to standard and properly equipped and staffed with ancillary scientific, technical, and administrative support staff to enable the forensic pathologist to undertake quality work;
- the forensic pathologist has a reasonable workload enabling proper attention to be paid to all casework;
- the forensic pathologists engage with the institution's quality system;
- systems are in place for the expert to engage in research, teaching, and relevant continuous learning; and
- systems are in place to bring to the expert's attention deficiencies in or disagreements with aspects of his/her work.

None of this alters the ordinary employment relationships that exist, but it would be wrong for the model forensic pathology service to direct one of its forensic pathologists to form a particular view or

express a particular opinion in a particular case. In the circumstance where a different forensic pathology view emerges from within the model service about a matter that is believed may be of significance, then the correct course would be for the Director of the model service first to canvass this with the pathologist involved, and if this does not appear to resolve the issue, then in one way or another, and in consultation with the prosecutor, to ensure that that different view is brought to the court's attention. Of course, it should be remembered that there is room in forensic pathology for difference of opinion and difference of emphasis to exist.

It has never occurred at the VIFM that two pathologists have provided conflicting testimony in the one case. What has occurred on at least one occasion is that a different opinion has emerged (when the prosecution sought confirmation of an existing opinion) resulting in a different opinion being provided by another pathologist. In one case, consultation with the original pathologist did not lead to that pathologist being inclined to alter the opinion, and a statement with the different opinion was written and provided. It was of insufficient importance, so it transpired, for oral testimony to be required.

Dealing with lawyers

Forensic pathologists understand the importance of both sides to a criminal proceeding receiving expert forensic pathology advice. In giving this advice—whether advising the prosecution or the defence—forensic pathologists from the model forensic pathology service believe they are serving the interests of justice and the court ahead of the interests of one or other party. It is this spirit that advocates unhindered dialogue, disclosure, and discussion between forensic pathologists acting for parties to a criminal action.

We realize the problems this can cause. In order to properly advise the instructing party, the pathologist may become privy to information that the party wishes to keep confidential and that may be subject to legal privilege. Unfettered dialogue runs the risk of the other party finding out about this information, defeating the legal privilege.

In essence, a pathologist confronted by a party that insists that certain information remains confidential will have to make a decision: whether the particular constraint significantly affects his/her ability to serve justice and the court because of the distorting affect of the constraint on the dialogue with the pathologist for the other party.

With this in mind, the following principles emerge:

1. In relation to a forensic pathologist who has performed an autopsy at a coroner's request,

- S/he is free to speak to any properly interested party in relation to that death;
- In so speaking, the forensic pathologist would be wise to ensure s/he knows the bona fides of the properly interested party and has taken steps to discover any reasons why s/he should not talk to that party (e.g, in a homicide, that the husband is or may be a suspect. If there is any doubt at all about the bona fides, the coroner, police, or prosecutor—as the case may be—should be consulted).
- There should be no constraint on the forensic pathologist who has performed an autopsy at a coroner's request discussing the death with lawyers acting for an accused person. Such discussion could reasonably result in provision by the pathologist of a supplementary report or opinion.

2. In relation to a forensic pathologist not previously involved in the case who is approached by lawyers acting for an accused person and who is contemplating providing advice to the defence for a fee, the lawyer should be informed that

- s/he will inform the other pathologist (upon whom the prosecution will be relying) of his/her involvement;
- s/he will feel free to discuss all aspects of the forensic pathology with the other pathologist;
- s/he invites the lawyer to specify what information s/he requires not to be shared with the other pathologist and will take that into account when agreeing or not to accept instructions;

- all advice provided will be reduced to writing (as verbal advice may not be subject to rules of disclosure);
- s/he will apply his/her best efforts to produce a report in a reasonable time; and
- instructions received very close to the start of a trial may preclude sufficient time being available to accept instructions for the provision of a report.

These principles would be espoused by the model forensic pathology service that should be sufficiently staffed to allow its forensic pathologists to engage in such work for the overall benefit of Canada's justice system. Part of this overall benefit includes the experience of providing advice to the defence for pathologists whose main occupation is producing reports upon which the prosecution rely. That this is an institutional value will be reinforced by the fees generated being paid to the model service, and not to the individual pathologist. The above principles will, generally speaking, be more loosely adhered to by freelance experts whose income will be more tied to the acceptance of such work.

Reviewability and accessibility of forensic pathology expertise by the defence

In relation to quality, a major structural weakness exists in Australia. In criminal matters, the defence has access to forensic pathology expertise to the extent that legal aid, and more critically, forensic pathology human resources, allow. Again, states do not provide sufficient capacity in terms of numbers of pathologists[43] to allow, in most states, any participation in the provision of advice to the defence. Apart from workload pressures themselves impacting on justice, this is a very important barrier to better justice outcomes in relation to forensic pathology in Australia. The model forensic

[43] If the capacity was created, it would take some time to fill it because there is no spare forensic pathology resource waiting for employment.

pathology service should be providing advice to the defence in other jurisdictions, just as the model services in those other jurisdictions should be doing for Ontario.

The critical importance of the defence in the criminal justice system is obvious to the model forensic pathology service. This is evidenced by the commitment of the service to the reviewability of its forensic cases,[44] and its commitment to the principles outlined above in dealing with lawyers.

When, if at all, should a second forensic pathologist representing the interests of the potential defendant or indeed retained by the defendant participate in the post-mortem examination or be permitted to conduct his/her own post-mortem examination?

There should be no difficulty accommodating the attendance of the defence pathologist at the first autopsy. In addition, if the body is still available, the defence forensic pathologist should be accorded every facility to conduct his/her own second examination. Two of us (S.C., D.R.) have undertaken a number of such examinations when working for several years in the U.K. (Such examinations are the exception in Australia.) We found that the main benefit of the second examination was the opportunity to speak to the first pathologist. This dialogue was a superb opportunity to clarify the pathology issues and to distill them to their essence. In our view, this was a very healthy thing. The cost for this is the keeping of the body, often for months. The requirement for a conversation should be mandatory. We have pushed for this within the profession with uneven results. It relies upon the pathologist being prepared to say to the instructing solicitor, on the very few occasions when it would be necessary: "You need to be aware that I will be speaking to the pathologist for the other side, and if that is a problem, then I have lots of other work to do, and you would probably be better off instructing another pathologist."

When, if at all, should the defence be permitted to consult forensic pathologists employed by the province?

[44] All the cases of the model forensic pathology service should be reviewable, but this has resource implications. Reviewable means that another forensic pathologist at another time and place can independently evaluate the findings upon which the critical conclusions are based.

As a matter of policy at the VIFM we hold ourselves open to talk to the defence in all matters. However, we do not make one of our pathologists available to be retained if another of us within the VIFM has been responsible for the first autopsy. We took the view at the beginning of the Institute's life that the potential for problems with the group dynamic outweighed the benefits. We may now be sufficiently mature to do this—especially if we espouse the view that there will be candid disclosure—and if the defence do not like that, they will have to go elsewhere. In Australia, and I suspect for the model forensic pathology service in Canada, defence pathology needs to be thought of on a national, and possibly even an international, basis. Contemporary communication technology means that such an approach is quite feasible.

How should defence access to a qualified pool of forensic pathologists be promoted?

This runs up against issues such as the worldwide shortage of forensic pathologists and workloads for forensic pathologists. In Australia, there should be recognition that forensic pathology institutions should be resourced to be able to contribute to defence pathology, since legal-aid levels of reimbursement simply do not provide sufficient income for the institution to build its forensic pathology capability. At VIFM, fees paid for any defence work undertaken by our pathologists is paid to the Institute. This has been the policy since the outset. While it is encouraged, in circumstances of excessive routine work demand, it is unreasonable to expect participation, notwithstanding the benefits that we all recognize flow from such participation. Legal-aid funds from other states, the largest procurer of such work, have more or less given up asking us because our likely response is known.

The formal relationship between the Coroner and the VIFM

Historically the Melbourne City Coroner administered the city mortuary through his Chief Coroner's Clerk. Pathologists attended on a fee-for-service basis by roster and there was also the Government Pathologist employed by the Attorney-General's department who undertook autopsies and provided reports in cases referred to him by the Coroner.

The *Coroners Act 1985* created the Victorian Institute of Forensic Medicine as a statutory body with a governing Council and a Director who was the person appointed by Monash University to its Chair of Forensic Medicine. The Coroner is a member of the Institute's Council. The Council sets the policy framework and it is the body to which the Director is accountable for the day-to-day affairs of the Institute.

The Institute has been established to serve a number of clients including the State Coroner (the major client of the Forensic Pathology Service), Victoria Police (the major client of the Clinical Forensic Medicine Division), hospitals (the major client of the Donor Tissue Bank of Victoria), universities, and other tertiary institutions. Numerous other clients are listed in our various business plans and annual reports.[45]

The VIFM and State Coroners Office (SCO) are co-tenants of the Coronial Services Centre, a purpose-built facility designed to accommodate both organizations. Each has its own designated areas.

Section 7(a) and (b) of the Coroner's Act set out the functions of the State Coroner.

The functions of the State Coroner are as follows:

(a) To ensure that a State coronial system is administered and operated efficiently.

(b) To oversee and co-ordinate coronial services.

Section 66 of the Coroners Act sets out the functions of the Institute:

(1) Subject to the directions of the State Coroner,[46] the functions of the Institute are as follows:

[45] Annual reports are available at www.vifm.org.

[46] Since the State Coroner controls the body, directs the performance of the autopsy, and ultimately makes findings, and since we believe the Coroner and the model forensic pathology service should be independent of each other (otherwise the judicial component of the Coroner's role is compromised) this qualifying clause is both unnecessary and confusing. In practice there are no directions about how the Institute should go about its work, which is essentially the content of the list of functions.

(a) To provide facilities and staff for the conduct of examinations in relation to deaths investigated under this Act;

(b) To conduct chemical, microscopic, serological, toxicological and other examinations of organs, tissues and fluids taken from deceased persons coming under the jurisdiction of coroners in Victoria;

(c) To identify by radiological or odontological examination or other means the remains of deceased persons whose deaths are being investigated under this Act;

(d) To conduct other appropriate investigations or examinations in relation to the cause of death of any person;

(e) To properly document and record findings and results of investigations and examinations;

(f) To provide reports to coroners about the medical causes of deaths and the findings and results of investigations and examinations;

(g) To provide facilities for the storage of tissue taken in accordance with the Human Tissue Act 1982 from deceased persons coming under the jurisdiction of coroners in Victoria, for use for therapeutic purposes.

The State Coroners Office lies within the magistracy and the Magistrate's Court Governance agreement, which does not include the Institute. The State Coroner is responsible for the state coronial system and "coronial services," which is taken to mean a degree of oversight of the operation of the State Coroners Office and coroners' role generally in the investigation of reported deaths. In relation to an autopsy, the coroners discharge this obligation by requiring the Institute or a pathologist to perform one. If there is some additional investigation or additional reporting required in relation to an autopsy, this can be obtained either by mutual discussion, or (although it has never been necessary) by direction.

Generally speaking, the autopsy service of the Institute is analogous to the services provided by Victoria Police for, and on behalf of, the State Coroner. The Coroner may require certain lines of investigation to be pursued by police, further reports to be obtained or provided, but the Coroner does not administer the police force, or tell them how to do their job. Interestingly, the State Coroner disagreed with a recent recommendation of the Parliamentary Law Reform Committee reviewing the Coroners Act to allow him/her to direct Victoria Police in relation to a death investigation. Victoria Police argued strongly against this recommendation as well.

Likewise the Coroner's ability to direct that an autopsy be conducted by the Institute does not extend to authority to direct the operational or administrative affairs of the forensic pathology service, let alone the other services of the Institute. It was never intended that the Coroner do so. To do so would create confusion of responsibility and accountability and, possibly, a conflict of interest. To the extent the Coroner became involved in directing specific aspects of the Institute's functions, s/he compromises his/her ability to criticize the Institute and the ability of the Institute itself to be held accountable. It would not be correct to hold the Institute accountable for operational and administrative directions made by the Coroner. It is vital to the proper administration of the Institute that the Coroner work through the Director in any matters related to the functioning or administration of the Institute.

In the 20 years of the history of the Institute there has only been one occasion where the State Coroner has felt it necessary to take a matter that could not be resolved with the Director to the VIFM's Council. However, this remains the formal mechanism by which the Coroner resolves issues with the Institute if he cannot convince the Director on a one-to-one basis.

VIFM budget is appropriated by Parliament to the Institute through the Attorney-General's portfolio within the Department of Justice. (This department serves the Ministries of Police, Corrections, Emergency Services, and Attorney-General.) We believe that this is a stronger arrangement than would be the case if funding were received, as it is for some sister institutions, from

health departments or health services. The priorities and sensitivities of health mean that the forensic pathology voice will not be heard through the noise of waiting lists, overcrowded emergency departments, and the crises that are endemic in modern health systems. Justice departments should, and in our experience, do understand forensic pathology better. As this Inquiry demonstrates, it is the justice system that is most affected by failures in forensic pathology, and this would seem to be another reason to have forensic pathology services located administratively, as well as functionally, within the justice system broadly.

4. Some Other Roles of Forensic Pathology

The forensic pathologist's role extends beyond dealing with suspicious deaths. As noted above, the vast majority of medico-legal death investigations involve natural deaths that society requires to be scrutinized and confirmed. The investigation of non-suspicious natural deaths, accidental fatalities, and deaths from suicide form the vast majority of casework. The information that can be gained from investigating these deaths is very significant for the community. The role of the forensic pathologist in relation to suspicious deaths and the criminal justice system is the one most readily understood and appreciated. However, the wider role with respect to non-suspicious deaths is less well understood by the layperson, the legal profession, and even the medical community.

Since the introduction of the *Coroners Act 1985* in Victoria there has been an increasing sophistication of death investigation to support the aim of prevention. This is evidenced by the development of the National Coroners Information System (NCIS), the work of the Clinical Liaison Service (CLS), the Consultative Committee on Road Traffic Fatalities (CCRTF), and the Workplace Related Liaison Service (WRLS).

Databasing death investigations: The National Coroners Information System (NCIS)

The NCIS[47] is a database containing all deaths reported to coroners in Australia since 1 January 2000. (Queensland data has been added from 1 July 2000.) There are now over 130,000 deaths on the database. The information includes the police report of death, the autopsy report, and the coroner's finding. Toxicology reports for some states are included. The aims of the NCIS are: to support coroners by providing them with access to investigations conducted in similar cases elsewhere; and to enable researchers and coroners to identify trends in various hazards in the community. The VIFM

staff that manage the NCIS undertake a wide variety of case-related research projects supporting coroners and forensic investigators with casework. In addition, the NCIS publishes regular newsletters identifying emerging death and injury trends and suspected community hazards as part of its role in enhancing community safety.

Helping prevent health-care adverse events: The Clinical Liaison Service (CLS)

The CLS is an initiative of the State Coroner and VIFM to improve patient safety—an example of the medico-legal partnership in action.[48] It utilizes coronial data regarding deaths in a health-care setting to address the underlying system factors that contribute to adverse medical treatment events. In particular, the tasks of the CLS include:

- assisting the coroner to investigate adverse medical treatment events;
- formulating a validated method for classifying and recording information that may be related to adverse events within health care institutions. This information will have many uses, including the analysis of individual or clusters of such cases and the reporting of trends that may be useful in the early recognition of underlying systems issues in health-care organizations;
- exploring the effective use of coronial data to inform changes to the health-care system as well as to the coronial process to improve patient safety initiatives;
- identifying the reform priorities for patient safety that reflect the interests of coroners, health departments, and health-care professionals throughout Australia; and
- improving communication between coroners, health departments, and health-care professionals about adverse medical treatment events.

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[47] NCIS has a budget of approximately A$750,000 pa and is funded 50% by the Commonwealth and 50% on a population pro rata basis by the six states and two territories. Achieving this was a major feat of administration.
[48] CLS is currently funded by the Department of Justice (A$250,000 pa) with an additional A$75,000 pa being provided by VIFM from its reserves.

The work of the CLS has highlighted that successful death investigation is also about getting the right approach to those who are the "subject" of the investigation. For example, using staff with medical training (albeit independent of the hospital system) to support the investigation of adverse events has resulted in greater communication with hospitals and health professionals. This has resulted in a higher level of reporting of adverse events, creating greater opportunity for the improvement of hospital procedures to prevent their reoccurrence.

Reducing preventable errors in the emergency and medical management of road trauma: The Consultative Committee on Road Traffic Fatalities (CCRTF)

The CCRTF functioned from 1992–2005 and was established under Section 139 of the *Health Services Act 1988* (which allows the Minister of Health to designate particular quality assurance activities as immune from legal discovery) as a joint initiative of the Victorian Institute of Forensic Medicine, The Royal Australasian College of Surgeons, and Monash University.[49] The Committee reviewed the emergency and medical management of individuals dying, after the arrival of the emergency services, following a road traffic accident. Its three principal objectives were:

- to identify organizational and clinical errors or inadequacies;
- to assess whether individual problems have contributed to mortality; and
- to examine the potential preventability of individual deaths.

The results of the Committee's work were fed back to hospitals in a way that allowed them to see their performance as measured against the remaining hospitals of their class as a group. This work led to an A$50,000,000 investment by the government in the state's Major Trauma System. The

[49] It has variously been funded at around A$220,000 pa by the Transport Accident Commission, the Department of Human Services (for one year), and the Victoria Trauma Foundation. All these agencies have a direct interest in, or responsibility for, improved trauma care.

consequent system changes have been demonstrated to have improved outcomes.[50] The CCRTF was wound up in 2005 because of funding difficulties. It started life as a research project and ended as an independent quality measure of the overall trauma system. A funder of this as an ongoing exercise could not be found.

Reducing work related death and injury: The Work Related Liaison Service (WRLS)

The WRLS assists the coroner by providing research-based evidence to underpin recommendations to prevent recurrence arising from workplace deaths reported to the coroner. While this unit is administratively located within the Institute, it relies on a close working relationship with the State Coroner and the State Coroners Office. The unit is funded by the Victorian WorkCover Authority, which has a substantial commitment, including a bottom-line interest in, prevention of death and injury in the workplace.

A model forensic pathology service, being the repository of much of the relevant knowledge and the linkage to university-based academic research support, should be strongly contributing to efforts expected by the community to learn from deaths to prevent their recurrence. The struggle for VIFM has been to build research and prevention into the DNA of the organization, as opposed to having them as optional desirable extras. The budget provided by the government does not recognize the centrality of these aspects of our institutional personality. Despite this, we have been able to attract funding for the above activities. In addition we have established a research portfolio. This is the mechanism to try and build research into the institution as a whole, rather than leaving it to the energy and drive of particular individuals.

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[50] See for example: (i) F.T .McDermott, S.M. Cordner, A.B. Tremayne, "Road Traffic Fatalities in Victoria, Australia and Changes to the Trauma Care System" (2001) 88(8) *British Journal of Surgery* 1099–1104. (ii) F.T. McDermott, S.M. Cordner, A.B. Tremayne, "A 'Before and After' Assessment of the Influence of the New Victorian Trauma Care System (1997–1998 vs 2001–2003) on the Emergency and Clinical Management of Road Traffic Fatalities in Victoria," Report of the Consultative Committee on Road Traffic Fatalities in Victoria, Transport Accident Commission/Victorian Trauma Foundation, 31 December 2003. (Available from the authors.)

Other services that can benefit from rejuvenated forensic pathology arrangements

Finally, Victoria's rejuvenated forensic pathology arrangements provided the perfect location for what was previously known as the police surgeon service, and which we now call clinical forensic medicine. These services are provided to Victoria Police by medical practitioners with a variety of backgrounds (general medicine; emergency medicine) in relation to

- the victims of crime (physical assaults, sexual assaults),
- drivers affected by alcohol or drugs,
- fitness to be detained by police or be interviewed by them.

The "forensic" backdrop shared with the pathologists has contributed to a particularly rich professional environment for both groups of doctors. This is a potential side benefit that can flow from the creation of the proper institutional arrangements. North America generally does not have strong arrangements for clinical forensic medicine.

Much could be written about the importance of facilitating access to human tissue for the purposes of transplantation and research. Suffice it to say that much good can be delivered to the community through these activities, and strength added to the morale and standing of the model forensic pathology service for undertaking them. A high level of understanding of the law and ethics of handling human tissue, and the related cultural sensitivities, is an obvious prerequisite for shouldering such responsibility.

5. The Mechanics of Medico-Legal Death Investigations

Where a matter involves obvious criminal issues, much of the practical investigation is carried out by the police on behalf of the criminal justice system. In these circumstances, there is a practical basis for concluding that the pathologist is carrying out a service for the police investigators, and not so much for the coroner. In reality, a criminal investigation involves many phases. Traditionally, the forensic pathologist was involved in that phase of an investigation centred on a death or injury, and in particular the examination of an injured or deceased person, to ascertain the nature and cause of his or her injuries. In practice, however, forensic pathologists play a wider role with respect to the criminal investigation. For example, they may become involved in the examination of scenes of death, or occasionally in the examination of suspects who may have inflicted injuries on the victim. They may evaluate medical records for medico-legal purposes, and examine the statements of other witnesses with regard to medical matters. They are certainly involved in the later stages of a criminal investigation, including the compilation of a brief of evidence and assisting with the evaluation and presentation of that evidence, both before and during court proceedings. We have termed the totality of a forensic pathology investigation, of which an autopsy is often the central part, the medico-legal death investigation.

Its components are set out below in Table 3.

Table 3—The process of the medico-legal death investigation (MLDI)

Steps in the MLDI	Supporting Personnel/Information
1. Scene	Attendance and evaluation by forensic pathologist, crime scene officers, investigating police, specialist investigators (e.g., blood spatter experts), photographers, video operators.
	Records, including photographs, video, photogrammetry.
2. Pre-autopsy information gathering	Police
	Coroner
	Child services
	Family
	Witnesses
	Clinicians
	Medical record
3. Body transport and admission to mortuary	Identification issues
	Early sampling
	Radiology, photography
	Chain of custody
4. Decision about autopsy	Authorized person, e.g., coroner, after appropriate consultation
	Autopsy/external examination/other
5. Conduct of autopsy/other examination	Radiological/ CT examination
	Photography
	External examination
	Internal examination
	Evidence collection
	Specimen collection
	Retention of organs and tissues
6. Specialists' examinations, opinion, analysis	Toxicology
	Histology
	Microbiology
	Molecular biology
	Clinical forensic medicine
	Neuropathology
	Biochemistry
	Genetics
	Tissue culture
	Radiology, etc.
	Prosthetic or device testing (e.g., implanted defibrillator interrogation)
7. Concluding the cause of death	

8. Report	May need to meet multiple needs: - Police - Courts - Coroner - Family - Medical professionals re: previous diagnosis and medical treatment - Statisticians - Public health officials - Registrar of births and deaths

Although presented as a sequential process, in practice this is a somewhat circular and iterative one. The history informs the autopsy, and the autopsy in turn informs the investigation of the circumstances and the scene of the death.

Another example of this is when, following the autopsy, the pathologist may request police to provide further information to assist in the interpretation of a particular injury. This may require police (or the pathologist) to revisit the scene or seek information from witnesses. Sometimes, the pathologist may seek further specific information from those caring for the deceased prior to death.

This chapter is predicated on the need by the pathologist for information prior to undertaking the autopsy. The autopsy is a problem-oriented exercise—it defines what some of the questions are in the particular death, and it answers others. It also tries to make observations that will help answer questions that have not yet been asked. The nature and detail of the exercise will be very different if the autopsy is conducted in an information vacuum.

Scene management

Should the pathologist who will perform the autopsy generally attend the potential crime scene? What, if any, protocols should inform that decision?

The management of the scene is important. The contribution of the pathologist at the scene is really that of an investigator. His or her eyes at the scene may well be the only ones to make relevant

observations that can be put together with the state of the body at the scene or later with the autopsy findings. In any event, there needs to be an accurate description of the scene, the environment, and the setting of the death. In the absence of a presence at the scene, it is helpful for forensic pathologists to have available to them prior to the autopsy, in addition to social and medical history: photographs of the scene; description of the position of the child when found; and description of the nature and details of any resuscitation at the scene and subsequently ambulance and/or hospital. Of course, if death occurs hours or days later in hospital, opportunities for objective scene evaluation will probably be significantly curtailed.

VIFM holds itself out to Victoria Police as being available on a 24/7 basis to attend any suspicious death scene upon request. This includes fatal hit-and-run cases. This is an important responsibility, since in all cases, but obviously with greater significance in suspicious deaths and homicides, the findings at autopsy will invariably need to be referred back to the scene. After all, it is in recreating the circumstances immediately surrounding the death that final conclusions are made by courts about the nature of the death and the culpability of any accused. There will often be a discussion with the Detective about the desirability of attendance at the scene. Attendance will often be of assistance in sorting out the nature of, what for police was, an uncertain situation. Attendance by the pathologist at child death scenes is relatively unusual, as these deaths are small in number, and the deceased is often no longer at the scene. Even so, later attendance may be of assistance.

Generally speaking, the scene is under the control of the police. Sometimes it is the Officer in Charge of the investigation, but increasingly the senior crime scene officer controls the scene. The pathologist is almost always structurally independent of police, but there needs to be a strong co-operative and collaborative spirit. Generally, this exists, and where it does not exist, institutional links between police and the model forensic pathology service will be the key to fixing it. A protocol should exist to define the collaboration. In addition the pathologist will be subject to the rules defined by the officer in charge. Occasionally there may be disagreement in relation to some aspect of the

management of the deceased. It would be very unusual for the view of the pathologist not to prevail. The pathologist should satisfy him/herself that sufficient photographs, in relation to the deceased, have been taken. Following photography and the securing of any exhibits, it may be desirable or even necessary to move the deceased, even remove clothing, to make observations to assist investigators. So long as things are rational and documented, they should be allowed. Rigid adherence to process will interfere with productive progress from time to time.

At VIFM, scientific/technical staff[51] attend all SIDS scenes within a three-hour radius of Melbourne.[52] The protocol is agreed on by the coroner and Victoria Police. Our staff, however, have the experience to evaluate a SIDS scene and provide information both about the scene and, from an interview with parents, other information of relevance to the pathologist. Parents are not obliged to participate, but are informed generally of the death investigation process and that the information provided may be of assistance to the pathologist in concluding why their baby died.[53] A strength of some medical examiner systems is the existence within them of a team of physicians' assistants, many with nursing backgrounds, who undertake such a role in many or even all of the deaths reported to the medical examiner. This is a great strength and should be implemented wherever possible. It is unfair to rely upon thinly spread police resources to deal expertly and rapidly with the many issues that arise in relation to deaths reportable to the coroner.

[51] These staff are university graduate scientists, or very experienced mortuary technical staff, who understand the issues in SIDS and are well able to interact with families. This service was initially funded by the Victorian branch of SIDS and Kids, a family support group involved also in raising community awareness about SIDS, but now part of VIFM's core service. The strong relationship with SIDS and Kids has been an important motivation for our staff to be involved in this work. We also provide if families wish a bronze model of the feet of their infant. This is funded by SIDs and Kids.

[52] This service is not activated if the death is regarded as suspicious or is being dealt with as a homicide. Such deaths stay firmly within police control.

[53] Police are not present, and no warnings are provided to parents since these deaths at this stage have had a preliminary assessment and are regarded as not suspicious. The following consents are explicitly sought from parents: 1. Can I share this information with SIDS and Kids (the relevant not-for-profit NGO looking after families following SIDS events)? 2. Can I share this information with colleagues at VIFM or other medical institutions? 3. Have you any objection to this information being included on the State Coroner's investigation file?

Pre-autopsy procedures

What non-medical information should be provided to pathologists performing such examinations and by whom? Some argue that pathologists should be provided with all information in the possession of the police to inform the conduct of the post-mortem examination. Others argue that such information should be circumscribed to prevent the opinion of the pathologist being biased by prejudicial or controversial information.

The autopsy is a problem-solving exercise that will contribute to working out how the death occurred. The better defined the problems or issues are, the more effective the autopsy should be. The pathologist should be provided with all the relevant information in the possession of the police at the time of the autopsy. Forensic pathology is very much better at saying that particular things did or did not happen, or might have happened in a particular way, than it is at creating circumstances *de novo* in the absence of any information at all.

Some express a concern that the pathologist will be biased[54] by the type of information provided before the autopsy, but generally this should not be an issue. In any event, institutional forensic pathology arrangements, such as the quality system, the collegiate atmosphere of the model forensic pathology service, and the understanding that the various actors in the death investigation system have about sticking to their roles, should militate against any continual abuse of information provided to pathologists. If it becomes an issue, the model forensic pathology service can respond to the police at an organizational level.

At a more immediate level, a full briefing about the available information will allow proper decisions to be made in relation to

- examining the scene and the body at the scene;
- the timing of the subsequent autopsy;

[54] See the companion paper: "Pediatric Forensic Pathology: Limits and Controversies."

- any risks of contamination posed by the circumstances of the case and the measures required to prevent such contamination; and
- the evidential issues raised by the circumstances of the case and how these issues are best approached.[55]

Increasingly, pathologists from the model forensic pathology service are making explicit their reliance upon elements of the circumstantial information that underpin any of their conclusions. As an indication of how pathologists think about circumstantial information, consider the following. In a recent case in Melbourne,[56] where the prosecution alleged that a mother had smothered four of her five babies over a period of years, and where autopsy in all four children, conducted by three different pathologists, failed to disclose any specific evidence that the babies had been killed, one of us (S.C.) made the following comment:

> Certainly, as forensic pathologists, we often evaluate autopsy findings in the light of supposed circumstances, or we try to recreate circumstances de novo from the autopsy findings. The core difficulty in this matter was the absence—on my view—or the paucity of autopsy findings allowing some type of recreation of the circumstances. In addition, forensic pathologists do not get into a consideration of circumstances of a psycho-social kind (e.g.: the fact "that one or more of the children might have been the result of an unwanted pregnancy") or that might indicate potential suspicion (that the mother was the last person to see the children alive) where those circumstances are unrelated to the autopsy findings or medical history. I believe that we are not necessarily equipped or trained to do that, and public

[55] These points are taken from: Home Office Policy Advisory Board for Forensic Pathology and The Royal College of Pathologists, *Code of Practice and Performance Standards for Forensic Pathologists*, November 2004. Copies available at www.rcpath.org.

[56] R. v. Matthey. The case against the accused mother was dismissed by the judge before the trial proper commenced on the basis that much of the evidence proposed to be led against her was inadmissible. The judgment can be found at http://www.austlii.edu.au/au/cases/vic/VSC/2007/398.html.

prosecutors and the courts are. In addition, they are probably not matters of expertise, and if that is so, pathologists are no better able to evaluate them than anyone else.

As we see later, if there is clarity about what information is being relied upon and how it is being used, then it is difficult to see what the problems are with providing all the information. Having said that, in Melbourne we need to give serious consideration to developing a more formal approach to this task. Prior to the autopsy there should be a minuted discussion between the investigating officer and the pathologist to receive what information is known at that time and to agree what the issues appear to be that might inform the progress of the autopsy. The absence of a formal process here has not, to date, caused us a problem in court.

The pathologist will cautiously consider several aspects of the pre-autopsy information in order to formulate what the issues are:

- the source of the information;
- the likely validity or veracity of the information; and
- the completeness of the information.

As mentioned above, the issue at this stage should be discussed with the police and minuted. The quantity and quality of information provided prior to autopsy, especially in contentious circumstances, is often small in volume and weak in reliability. This is, as a general observation, a universal phenomenon. This is an inherent problem in medico-legal death investigations, as there has been insufficient time to gain such information from unavailable, or often distraught, people involved. The model forensic pathology service operates within these constraints and works with coroners and police to try and improve this as much as possible. All of the above information provision in Victoria occurs

within the overall rubric of the coroners' system. Effectively, the police officer is dealing with the pathologist as the coroner's agent.

Body transport and admission to mortuary

These are technical functions that are often contracted out to funeral directors. Some medical examiners' systems undertake this function themselves, which makes particular sense as they then have a physical presence at the scene. The model forensic pathology service would do well to consider emulating this. It also maximizes continuity and communication, and enhances relationships with the family. Admission to the mortuary represents a further opportunity to formally assess the status of the death and identity, make records, and secure clothing and other material. The model forensic pathology service would be relied upon to assist with identification of the deceased, at least where medical and scientific techniques are required. There is a strong case for the model forensic pathology service to be responsible for the whole identification process. In a coroners' system, this would entail providing advice to the coroner as to identity, as for cause of death.

Decision about autopsy

Whether there will be an autopsy is a decision that must be made every time. Who should make this decision and on what basis is a policy issue for the jurisdiction. A fundamental consideration in this regard will be the weight that is to be placed on religious and cultural beliefs in relation to autopsy. To the extent that these weigh against autopsy in the policy that is articulated, and communities are of course perfectly entitled to express their preferences against autopsy, then it needs to be understood that important benefits associated with autopsy may not flow, including the detection of hidden

homicide.[57] Left to their own devices, the public and their representatives will tend not to be in favour of autopsies. The model forensic pathology service will be understanding of this general attitude.

With the policy position having been set out in legislation or in some other way, the factors that might influence particular decisions about autopsy in particular cases include the presumed nature of the death, organizational and professional expectations, personal experience, and perhaps explicit or implied pressure from families, clinicians, and/or investigators. The availability of resources ought not to be a consideration, but in various ways may become one.

If we assume every infant and child death should be treated as a case of intentional harm unless proven otherwise, we will essentially treat every sudden unexpected death in infancy and childhood as a suspicious death. Many families will be traumatized by being caught up in a criminal investigation with all of the stigma and reputational consequences of that. This is the logical consequence, or at least a potential complication, of a "think dirty" policy. The complete reverse would be to assume that every case is a non-intentional death until proven otherwise. It seems to us that the best approach is to make the best decisions possible on the best information that is available. The challenge is to improve the early availability, quantity, and quality of this information. The basic policy should be to "think truly," with advice being provided by the relevant professionals with appropriate training and experience to make such decisions. In coroners' systems, coroners should seek such advice and follow it, resisting the temptation to substitute their own views unless based on relevant training, education, and experience.

Particularly difficult situations that require special consideration in decision making in medico-legal death investigation, perhaps especially in cases involving children include:

[57] In a country with a strong Muslim tradition, a young wife was found face down in a bowl of water in a bathroom. The attending medical officer said there was nothing suspicious based on his examination of the deceased at the scene. The police did not request an autopsy. The husband married another woman three months later and tongues began to wag about the first wife's death. The police arrested the husband and charged him with murder. He was in custody for five years awaiting a hearing. A report from one of us (S.C.) stated that while homicide was a possibility, the absence of an autopsy meant that a whole range of sudden, natural causes deaths, following which she collapsed where she was found, could not be excluded. While it was perfectly

1. Objection to an autopsy by family;
2. Organ and tissue donation for transplantation;
3. Limited autopsy because of apparent clarity of issues from clinical investigations at the time of death; and
4. Exhumation.

These will require sensitive discussion with families by staff well versed in the autopsy, its benefits generally, and its process in the case under consideration.

The model forensic pathology service is quite capable of deciding which cases require autopsy and which cases do not. However, it is also sensitive to the possibility of criticism that it is creating its own work.[58] For this reason, and because the decision for autopsy is a public policy–type decision, and not just a technical one, the model forensic pathology service is supportive of the coroner making this decision. The coroner will often seek the advice of the model service before making such a decision.

Conduct of autopsy

Does the model forensic pathology service select a particular forensic pathologist for a case, or is it simply the pathologist who is rostered on?

The answer to this question requires an understanding of the model forensic pathology service's institutional approach to the medico-legal death investigation. This means, for example, that whoever decides there will be an autopsy does not choose an individual forensic pathologist to undertake that autopsy, but directs the model forensic pathology service to undertake the autopsy.

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acceptable for a society to perform a relatively small number of autopsies, this comes at a cost. Part of the cost is that it will be more difficult to detect hidden homicide. In this case the husband was released.

[58] The model forensic pathology service understands better than most the value of the autopsy. This will be interpreted by some as advocacy for autopsy, and that the service cannot objectively evaluate the need for autopsy. At VIFM we have tried to articulate the value of autopsy in particular cases and are very comfortable with the actual decision being the coroner's.

The caseload dealt with by the model forensic pathology service comprises the full range of deaths reported for investigation. This includes:

- gunshot and explosion deaths;
- transport-related deaths (drivers, passengers, pedestrians, trucks, cars, tractors, trains, planes, etc.);
- deaths in custody (including restraint deaths);
- burns and scalds (including deaths following fire);
- electrical fatalities;
- fatal pressure on the neck;
- immersion deaths;
- neglect, starvation, and hypothermia;
- deaths associated with sexual offences;
- deaths associated with pregnancy;
- stillbirths and deaths around the time of birth;
- sudden, unexpected death in infancy;
- fatal child abuse;
- deaths associated with surgical procedures/adverse events generally;
- dysbarism and baro-trauma;
- all forms of natural death (often sudden): cardiovascular, neurological, respiratory, genito-urinary, gastrointestinal, endocrine, hematological, immunological, infectious;
- all forms of self-inflicted injury;
- all forms of homicide, accident.

The community expects that the model forensic pathology service will be able to deal with the investigation of all forms of death to a reasonable, if not a high, standard. These expectations in

contemporary society have been fashioned by the increasingly specialized nature of medical practice, and the rise of consumerism. In meeting these expectations, the model forensic pathology service will be sensible to the need to involve relevant subspecialty pathologists or clinicians in particular cases. This might be a neuropathologist in a complicated head injury death, for example, in a contentious pediatric head injury. It might be a cardiac pathologist in the apparently negative autopsy of a 40-year-old woman found dead in bed. It might be a pediatric pathologist in a case of known congenital heart disease whose death during surgery was reported for investigation. Consultation about particular cases with forensic physicians, cardiologists, endocrinologists, surgeons, obstetricians, and many other clinicians will occur during the ordinary life of the model forensic pathology service. Increasingly, reliance upon radiology, especially CT imaging, means that radiologist advice is also required.

So, a properly staffed model forensic pathology service is not only staffed with forensic pathologists, although these will comprise the greatest number of medical specialists. There will also be anatomical pathologists, and other subspecialty pathologists as set out in the previous paragraph. In cases where there is likely to be significant legal contention, whether criminal or civil, a forensic pathologist will almost always take the lead by being allocated that case. S/he will involve other pathologists, as s/he believes necessary to deal with the issues. In what appears to be a SIDS case, any forensic pathologist might be allocated that case, but so also might the part-time pediatric pathologist.[59] If the former, the pediatric cases are spread around equally so that all forensic pathologists share this work and do not lose skill. In relation to obstetric deaths, of which there will be small numbers in developed jurisdictions (e.g., we have four to five a year in Victoria), one of the model service's pathologists has probably developed a particular interest and undertakes most of these. This can be dangerous as the rest of the pathology group become de-skilled and might be in trouble if the pathologist is away when an obstetric death is reported. Others of the Institute's pathologists have developed particular expertise (gunshot wounds; motor vehicle accidents; CT scanning). Clearly the

pathology group recognize this and benefit from the different expertises. (Gurus, if they emerge, are difficult to deal with in whatever walk of life. The more common difficulty is how the pathology group deals with its leader if s/he begins to deviate from the mainstream.)

In relation to homicides and suspicious deaths, the model forensic pathology service has a roster. A forensic pathologist is rostered on for a week at a time and is responsible for the medico-legal death investigation in all the homicides and suspicious deaths reported in that week. The average in Victoria is two to three a week. As with all other deaths, subspecialists are involved as required. In two recent non-accidental injury infant deaths in Victoria involving one of us (S.C.: forensic pathologist), the report was co-signed with the pediatric pathologist. Both pathologists attended to give evidence and the pediatric pathologist was asked to sit in court to hear the forensic pathologist give the evidence first. The pediatric pathologist was then called and asked if he agreed with what he had heard, and was asked one or two supplementary questions that, during evidence, the forensic pathologist had asked to be referred to the pediatric pathologist. This requires co-operation and also has resource implications; the latter are minimized where the pediatric pathologist is engaged by the model forensic pathology service, as attendance at court is part of the position description.

All post-mortem examinations in deaths reported to coroners in Victoria are undertaken by a qualified pathologist, or by a trainee pathologist under the supervision of a pathologist, assisted by trained mortuary scientific and technical staff.

How should the information provided be recorded to promote transparency? Which, if any, post-mortem examinations should be videotaped? Which, if any, should be audiotaped? How should the coroner's office or forensic pathologists ensure quality photographs are taken during the post-mortem examination?

The pathologist is responsible for ensuring that sufficient numbers of photographs of sufficient quality are taken during the autopsy. This responsibility can be more clearly shouldered if the

[59] If during the course of the autopsy, the pediatric pathologist becomes concerned that the death may be

photographers are employed by the model forensic pathology service. In Victoria, the photographs in homicides and suspicious deaths are taken by Victoria Police photographers.[60] They are also responsible, together with the investigating police officer, for selecting the photographs that are included in the brief. Digital photography now means that the pathologist can view the photographs as they are taken to ensure that they demonstrate what the pathologist needs to demonstrate. VIFM has only one in-house photographer, which is completely inadequate for the increasingly onerous responsibility of ensuring independent reviewability of as many cases as possible. Scientific and technical staff in the mortuary can also be trained to take photographs, and many pathologists develop the skill out of interest.

All autopsies at the model forensic pathology service are digitally audio-recorded during and/or shortly after the autopsy by the pathologist. The digital file is kept with the electronic case file. There is also an electronic case management system (iCMS) that keeps track of bodies, records the allocation of autopsies, and holds all records together in one named and uniquely numbered electronic case file. The elements of this electronic file are set out below in Table 4.

Table 4—VIFM iCMS (electronic case management system)

Element of the iCMS	Description
Body condition	Summary observations of the deceased made upon admission to the VIFM.
Case notes	Relevant extra information added by anyone with access to the iCMS.
Case reports	Relevant reports submitted or collected other than VIFM reports.
Circumstances	Police summary of the circumstances of the death.
Court visits	Record of courts attended in relation to the case.
VIFM reports	All VIFM reports about the particular case generated here. Pathologist can easily make his/her own corrections.
Family contact	Record of all contacts made with family members.
Victoria Police Form 83	The demographic and other police-provided information.
Imaging	All photographs generated from the case are held here. This includes images provided by Victoria Police as well as those taken by our in-house photographer, and

suspicious, a forensic pathologist is asked to assume responsibility, and the police are informed.

[60] There are advantages to this, especially in relation to the logistics of producing multiple hard copies to accompany the brief of evidence, and for the court, including juries.

	microphotographs of histology taken by the pathologist. (CT images are kept in a separate system.)
Medical record	Enables the medical record to be tracked through the Institute.
Post-autopsy	A major screen recording the cause of death, entered as soon as possible following autopsy, the ordering of toxicology tests by the pathologist, the availability of the body for release, the toxicology report, and a classification system for the death. The date of archiving the report on this screen is an important KPI for the VIFM.
Radiology	Holds copies of plain radiographs. There is a separate system for the CT scan images.
Schedule case	The Institute's Liaison Officer schedules the cases for autopsy from this screen.

In addition to this electronic file, the Institute keeps a hard copy of the autopsy report and its attachments. This is in addition to a copy provided to the coroner and, if required, to police. According to policy, copies will be provided to the next of kin of the deceased.

Any notes should be retained and may be referred to in the autopsy report if they appear to be relevant. The notes should be made available to any party upon request. Much of this comes down to resources. How much time is available to produce a voluminous report that may contain a lot of irrelevancies? Facilities to video the autopsy should be routinely available, at least as a training tool. All police forces in developed countries would have this capacity if they wished to use it. For most cases it would be of little use and would not be reviewed by anyone. The resolution of video is such that unless a lot of time is taken in producing the video professionally, lengthening the time of the autopsy considerably (a resource issue in terms of the pathologist's and everyone else's time), it may not answer the numbers of issues that might be thought would be answered, e.g., the presence or absence of particular traces of evidence.

Whether the conversation at the autopsy should be audiotaped is a question sometimes posed. This would probably have the effect of reducing what is generally minimal conversation anyway to even less. For many pathologists, the exercise of undertaking the autopsy is a logistically and mentally demanding exercise, with much of the evaluation and making of conclusions occurring afterward.

Verbal opinions to police

Under what circumstances, if any, should pathologists communicate verbal opinions to police officers? How should such verbal opinions be memorialized to promote transparency? What, if any, protections should exist to prevent misuse or misreading of such verbal opinions or the limitations thereof?

Forensic pathologists are sometimes called by police officers to give a verbal opinion prior to the finalization of an autopsy report. A forensic pathologist should probably not offer an opinion that he or she would not be happy to be cross-examined on later in court. Following autopsy, as before, there should be a formal minuted conversation with the investigating officer where the autopsy findings are presented in summary and answers provided to the issues agreed on before the autopsy. This does not yet occur on a formal organized basis in Victoria, but it should.

Some advice provided in this context may be of investigative use, but of little or no probative value. For example, the different number of injury types present might indicate a likelihood of more than one assailant.

Critical importance of the mortuary staff

The model forensic pathology service will have professionalized, scientific, and technically qualified personnel staffing the mortuary. There will be a mix of genders amongst the staff. They will be staff that can interact, if necessary, with families and other stakeholders. In the case of the VIFM, they are staff who

- visit SIDS scenes;
- understand and are trained in sterile technique and the removal of tissue for transplantation;
- contribute to research projects;
- participate in the collegiate approach to management and administration of the Institute as a whole;
- assist at exhumations;

- contribute to the organization of and participate in DVI (disaster victim identification) training exercises mounted by VIFM overseas;
- participate in actual DVI events nationally and overseas;
- provide scientific and technical assistance at autopsies;
- staff the mortuary 24/7; and
- can articulate the ethical issues associated with managing and working in a mortuary.

These staff can make or break the model forensic pathology service. The culture they express in their work will become apparent to the outside world sooner or later, and will express the values and manners of the service. The staff need to be solidly behind the value of the work they do. This provides the psychological context for what might otherwise be more difficult work. With such a belief, the mortuary staff will be engaged with the quality management system. With such a belief, the model forensic pathology service can confidently leave the day-to-day running of the mortuary largely in their hands.

Specialists' examination, opinion, analysis

Should such expertise ever be provided in verbal form only? How should such expert opinions provided to the forensic pathologist be memorialized? What role, if any, should other physicians play in providing expertise to the forensic pathologist? When should consultations be obtained (and from whom)? Should they be at the initiative of the forensic pathologist performing the post-mortem examination or at the initiative of the coroner?

Certainly this should occur on the initiative of the pathologist, who, if s/he is sensible, will also be open to suggestion about any further advice that might be desirable. As Table 5 below demonstrates, once the model forensic pathology service understands the obligations it has to others

(e.g., families, treating doctors), then the needs of these stakeholders will also be important in the decisions to involve other specialists.

As mentioned in the companion paper “Pediatric Forensic Pathology: Limits and Controversies,” there has been an explosion of medical knowledge in the last 20 to 30 years. This has dramatically expanded the information forensic pathologists are expected to be familiar with, as sudden unexpected death could occur against the backdrop of any of this knowledge. The practice at the VIFM is that any such additional advice sought is reduced to writing, referred to in the autopsy report itself, and attached to the autopsy report. The written advice may well form part of the background to the opinion provided at the conclusion of the autopsy report. Rarely, the provider of the additional advice will be summoned to give evidence. The provider of the additional advice tends, in the advice, to steer clear of firm opinions about the significance of the advice in the particular case. This can occur as the case progresses and the issues refine themselves.

Concluding the cause of death

For a discussion of this part of the forensic pathology service, see “Concluding the Cause and Circumstances of Death” above, and also the companion paper “Pediatric Forensic Pathology: Limits and Controversies.”

Final autopsy report

Generally, what should the content of post-mortem reports be? Should that content be informed by guidelines or protocols? What is the appropriate scope and limitations upon the opinions expressed in post-mortem reports? Who should receive these reports? Coroner, prosecution, defence, and family?

The report is the means by which the validity of the autopsy will be assessed. Validity is “the degree to which the measure reflects the truth of the phenomenon of interest. The perspective of the user defines the purpose of the instrument, whether the instrument is capable of fulfilling that purpose

is the test of validity."[61] So the validity of the autopsy depends upon the perspective of the user. This is very important for pathologists to appreciate.

One of the significant challenges facing many sectors, including medicine generally, and certainly forensic pathology, is the complexity of the surrounding context. One major and developing complexity is the appetite of the context for information. This appetite has developed in parallel with the increasing accessibility of information generally, especially through the Internet. The stakeholders in forensic pathology have deep and often emotional interests at stake in information related to the death. Often, these stakeholders have done considerable homework before they receive a report, or before they approach the model forensic pathology service. The model service needs to be able to help them sift, organize, contextualize, and understand the information they have gleaned and the conclusions the service has made, since often no one else is in a position to do so. This requirement soon comes up against resource constraints.

Thus a report of a medico-legal death investigation, usually presented in the form of an autopsy report, should meet the needs of those depending upon it. This is summarized in the table below.

[61] In this quote, instrument = autopsy, measure = autopsy report, the phenomenon of interest is what any particular user is interested in obtaining from the autopsy.

Table 5—What the users need from the medico-legal death investigation, and the consequences of this

User	Purpose of the Investigation as Defined by the User of the Results	What Is Required to Fulfil the Purpose
Family	- Why did my baby die? - Cause of death - Manner of death - Is there anything we could have done to alter the outcome? - Did the doctors treat my baby properly? - Did you find anything that might affect any future children I might have?	Families need to have these things communicated to them, at least in a report if not also verbally, by someone in a position to do so knowledgeably and sensitively (e.g.: family practitioner who has been provided with a copy of the autopsy report; a medical coroner; a nurse trained by the model service; in some cases the forensic pathologist. The model service might run a "forensic pathology out-patients" service). A proper understanding of the death is likely to have therapeutic benefit.
Police	- Is there anything to indicate criminality on anyone's part? If so, what are the details? - Can you rule out criminality? - Can we confirm the identity of the deceased? - What is the cause of death? - I need this information in a timely way so that a proper investigation can commence	Expert communication, in a report and also verbally, by the pathologist with one or more police officers of sufficient training and experience to enter into reasonable dialogue with the pathologist.
Coroner	- Needs to fulfill statutory functions: - often to provide a formal record of who the deceased is; - formally finding the cause of death; and - a discussion or statement of how the deceased died (may include discussion about the manner of the death).	Expert communication and formal reporting by the pathologist to the coroner. Other less formal assistance to the overall coronial investigation.
Prosecutors	- Cause of death - What happened - What are the elements of the report that assist in establishing that the accused did what s/he is charged with? - Explain what it all means so I can understand it. - What can I absolutely rely upon; what are the weaknesses from a prosecution point of view? - What is the pathologist's real opinion about the core issues in this case? - What can the pathologist envisage might be challenged by the defence in this sort of case?	Formal expert reports from the pathologist supplemented by conferences with prosecutors and the provision of oral evidence. Great importance attached to "no surprises" and "coming up to proof."

User	Purpose of the Investigation as Defined by the User of the Results	What Is Required to Fulfil the Purpose
Defence	- Cause of death - What happened? - What does this all mean? - What elements of the report frustrate attempts by the prosecution to establish that my client did what s/he is charged with doing? - What can be relied upon, and what are the weaker elements of the report?	Formal expert report provided to prosecutors should encompasses this material. Often there is insufficient information available to address defence concerns in advance in this way. Access by defence to the pathologist should be possible.
Courts, juries	- Cause of death- What happened? - Independent account - Can we please have this explained to us in plain language?	Clear account in ordinary language given in person in front of the jury. This will be assisted by experienced counsel who have done their homework, and who have had a pretrial conference with the pathologist in all but the most straightforward of cases.
Medical caregivers; hospitals	- What were the diagnoses made at autopsy? - Did we get the clinical diagnosis/es right? - Did we miss anything? - We would like to discuss the findings with the family so we need the findings very soon, and we need to understand them.	Ability to communicate sensitive information to caregivers informally (so that early communication with the family by caregivers is possible) and formally in reports.
Child protection officials	- Cause of death - What happened? - Is there anything from the investigation to suggest that the deceased has been subject to adverse events, because if so, clearly the spectre of surviving children being exposed to similar dangers needs to be evaluated and possibly action taken. - Can you tell us this as soon as possible? - How sure are you that what you think happened in fact happened? - What are the other possibilities? - What can we absolutely rely upon, and what are the weaknesses in your opinion? - What is uncertain?	Expert communication, both written and verbal, with suitably experienced and trained staff. Whether this is undertaken by the pathologist or others on his/her behalf will vary between jurisdictions. Pathologist may feel a medical duty of care arises to ensure correct information transferred and may intervene directly.
Organ transplant units; tissue banks	- Cause of death - Is there any disease present that could pose a risk to the recipient of the deceased's organs or tissues? - Have inquiries been made about lifestyle habits of the deceased and his/her past	Formal reports, supplemented on occasions by verbal communication.

User	Purpose of the Investigation as Defined by the User of the Results	What Is Required to Fulfil the Purpose
	medical history?	
Statisticians, including Registrar of Births, Deaths, and Marriages	- Cause of death - Manner of death - Is the cause of death a recognizable entity that can be properly coded and recorded?	Formal reports
Researchers, including those interested in death and injury prevention	- Cause of death - What happened? - Has the death been properly evaluated so that any preventive learning can be extracted from this death?	Formal reports

Forensic pathology differs substantially from laboratory medicine generally and forensic science in that it involves relatively low case volumes, with enormous diversity between cases. In this sense, an autopsy report resembles much more closely the report of an operating surgeon than the discrete set of numerical values reporting a blood test. Any forensic pathologist learns quickly that no single report meets the needs of the full spectrum of the target audience. For example, a description of "situs solitus of the atria and ventricular d-loop" may enlighten the cardiothoracic surgeon, but it does not tell the lay coroner, lawyer, or next-of-kin that the plumbing at the base of the heart was normal. It is not difficult to produce an exhaustive, encyclopedic report that by its size and density gives a semblance of the highest standard but yet falls critically short in failing to communicate the necessary interpretation of the facts to the target audience.

A model forensic pathology service, properly resourced, would produce separate reports for different "clients" or "users" derived from the same data set. Table 5 above sets out the different needs these clients have. All the reports would be consistent with each other, and some would overlap in content. In some cases, it might be possible to meet multiple clients' needs in the one report. This development could be serviced to a certain extent by physicians' assistants made available to pathologists. At the present, almost universally, only one report is produced, which is expected to satisfy the needs of all clients. This will increasingly come to be seen as not acceptable, or alternatively, reports will become more voluminous and unwieldy in their attempt to please everyone.

Ideally, the report for the criminal justice system (e.g., police, prosecutors, defence, courts) would be crafted, in part, in response to questions posed in writing. While this does occur on occasion, in most cases the report contains within it the response to the following imaginary, open-ended request: “Following your involvement in the investigation of the death of xx, would you please describe your observations, and the conclusions that derive from those observations that you believe would assist, including your opinion as to the cause of death.”

Commentary should be designed to respond to anticipated questions and issues that experience (and knowledge) indicates will be of significance in, for example, a trial. Every forensic pathologist knows that in a homicide trial, the prosecution has to prove that the accused killed the victim. Usually it is not a problem to establish that the victim has been killed; i.e., died consequent to injuries sustained in some sort of assault. Cases where this is a problem to prove are fascinating and require detailed explanation. There might be discussion about whether a particular death from incised wounds to the neck was homicidal or suicidal, for example. Clearly the forensic pathologist will know that s/he is a central contributor to this discussion. If there is a contribution to be made, it is clearly preferable that the contribution be made as early as possible and in writing. This is particularly so if there are likely to be elements of controversy in the opinions or conclusions. Every forensic pathologist should be aware of the importance of giving the defence every opportunity to consider the views of the pathologist who will be called by the prosecution.

The final step in producing a report at the VIFM in “forensic” cases is the technical review. Appendix 5 contains a copy of the policy and the form completed by the reviewing pathologist.

Provision of evidence

The next dimension of the pathologist’s autopsy-derived justice obligations is the provision of evidence. Relatively little has been written about this specifically, although volumes have been written

about the slings and arrows of expert evidence generally. A pathologist's evidence can be used to meet a number of needs in, for example, a homicide trial.

The cause of death is an important formal part of the proceedings. In most cases the alleged actions of the accused are relatively easily causally connected to the death. But complex discussions can arise

1. in relation to the interaction between injuries and natural disease. For example:
    - the role of any pre-existing natural disease making a fatal outcome more likely and, therefore, by implication, the injuries less significant;
    - the relationship between the injuries and subsequent delayed deaths (e.g., bronchopneumonia; pulmonary thrombo-embolism).

2. in relation to the circumstances where these conclusions are very useful for the court to titrate them against the statement of the accused as a more objective measure of the accused's credibility. For example:
    - the homicidal nature of the injury or wounds, versus perhaps their being caused in falls;
    - any other conclusions that can be drawn about the circumstances in which they were caused, for example, the order of the infliction of multiple injuries and what implements may or may not have been involved in the production of the injuries;
    - whether any injuries on the deceased may indicate aggression on his/her part;
    - if more than one assailant, which wounds were more serious and which of multiple options might have caused those wounds.
3. in relation to the accused. For example:
    - the effect of certain drugs or alcohol on the behaviour of the accused;

- the significance of particular injuries suffered by the accused, especially where self-defence may be an issue.

Whether or not a pathologist will answer such questions about the accused depends upon the individual pathologist and the circumstances. Some might think questions about the clinical effects of drugs extends beyond their expertise.

The remarkable thing about providing expert evidence is that it may not be until after one is in the witness box that one is asked to apply the findings to the unique fact situation of the particular case. This is one of the weakest links in the forensic pathologist's contribution. The performance in the mortuary and the creation of a written report are amenable to audit and review, although the extent to which this happens and its effectiveness is variable. However, the reality, at least in our experience, of police investigations and the preparation of prosecutions and defences, is that the facts or legal matters at issue in the particular case may not crystallize until the days leading up to the trial. They may not be put to the pathologist until s/he is in the witness box. For the pathologist, putting the autopsy findings together with the unique fact situations of the particular case is one of the fascinating aspects of the subject. When this occurs without much opportunity to consider the questions particular to the case, however, it is one of its vulnerabilities. It puts the pathologist in a difficult position, as s/he may seem to be less than helpful if some resistance is displayed in responding to questions. Conversely, insufficiently considered replies may inadvertently be given. (In this latter context, it would only be the more experienced witness who might think to ask for time to consider a response.) For this reason, it is very important for the witness to be cautious. It is very easy for pseudo-science to pass as evidence in these circumstances because of the status that is accorded the witness.

It is a truism that there are too few pretrial conferences with counsel. Yes, the pathologist can always ask for one, but that is not really the order of things. The pathologist is a servant of the system. Actively seeking participation could be regarded as a slightly unhealthy degree of interest in the

outcome. The level of communication also overlaps with considerations of workload, for all the stakeholders. It may be that a trial judge would, or should, be interested in new fact scenarios being put to the pathologist, for the first time, in the witness box. There would be a good case to be made for such scenarios to be reduced to writing and given to the pathologist in sufficient time for a considered view to be formed.

As far as we know, performance by the pathologist in the witness box is not subject to audit anywhere, in Australia at least. (It is, of course, subject to the adversarial process, which is a form of quality audit, but most would agree that, in the circumstances of issues crystallizing in the days before trial, this might not be very effective.) At the VIFM, the standard is that twice a year, a pathologist (and other evidence-giving staff) should be accompanied to court by a peer who listens to the evidence given. The two are required to have a discussion about the evidence and the way it was given and document the facts of the discussion. Unfortunately, but understandably, attempts to engage the bar in evaluating pathologist performance has been difficult. They have too many other matters on their mind during a trial. Involving the judiciary would not be appropriate, but it would be useful for the model forensic pathology service if there were feedback from the bench. This occasionally happens informally, and again VIFM's institutional structure promotes this. Such feedback may be an important early sign of importance to the next section: how to catch bad pathology.

Catching bad pathology

What actors in the system are in the best position to catch bad pathology, i.e., another pathologist, a coroner (legal or medical), a prosecutor, a defence lawyer?

Bad pathology needs of course to be distinguished from areas where it is quite proper and reasonable for differences of opinion to exist. But there is definitely such a thing as bad pathology. Of course, it should be caught before it escapes. An institutional approach to the discipline will minimize the possibilities of bad pathology escaping. If it does get out, how do you catch it? Well, that is hard. It

seems that there is general agreement that the adversarial system does not have good safeguards against decisions/convictions based on poor expert evidence. In trying to prevent the provision of poor expert evidence, the discussion will tend to focus on professional education and training and other quality-related internal institutional mechanisms.

If it does escape, probably another pathologist is the best person to catch bad pathology. It is at this point that difficulties arise, assuming that it is a pathologist from another service that might have "caught" it. What can the pathologist do? It is occasionally said: "Oh, you must have known that so-and-so was a dodgy pathologist. Why didn't you do something about it?" Certainly it is a matter of degree, but we have not seen in our own experience such appalling practice that we have felt we should immediately "blow the whistle."[62] Generally, it has to be said that we have insufficient detailed knowledge of a sufficient number of cases to make a judgment as to the person's competence. To make a general conclusion as to a professional person's incompetence (which is a different judgment to a conclusion about performance in an individual case) requires a judgment about a sufficient slice of the person's work from which to generalize. It is possible that a person might make such a mistake in one case that a generalization could follow. That would be a rarity. But back to the question of how to catch bad pathology. Once the pathologist is in the witness box, it is generally too late (but see discussion on defence pathology) and the question then becomes "How does one respond to bad pathology?" What are the proper mechanisms of response, assuming all legal avenues of appeal relating to the case have been exhausted?

We are supporters of the Criminal Case Review Commission (CCRC) that has been established in England and Wales. This provides a mechanism for those who assert that they have been badly served by justice but who have exhausted their formal legal remedies. Amongst those who have had wrongs righted include those who have been adversely affected by poor expert evidence, including the evidence of forensic pathologists. The CCRC is another imposition, however, upon the

scarce resources of the forensic pathology sector. It, and other forms of review, can divert such resources away from the daily casework, pushing those cases down the hierarchy.

A consumer-oriented society demands a greater degree of accountability and scrutiny than hitherto of its public institutions, including the professions. Many disciplinary mechanisms of "self-regulating" professions in contemporary society now include lawyers and lay people in the decision-making processes, rather than simply members of the profession itself. More specifically in relation to the performance of the pathologist, the overseer of forensic pathology in England and Wales, the Home Office, administers The Board of Forensic Pathology, which has a disciplinary mechanism. A panel consisting of a lawyer, a forensic pathologist from another country, and a layperson will conduct a formal hearing into a pathologist's performance. Without going into detail, this approach has a distinct advantage over a disciplinary process such as the one that dealt with Professor Meadow at the General Medical Council (GMC). Although not a forensic pathologist, he was a specialist medical practitioner appearing as a witness for the prosecution in a criminal trial, and it was for his performance in that trial that he was reported to the GMC. The panel that heard his case was chaired by a layperson, and of the other six members of the panel, three were doctors and three were lay people. In the Home Office process, the disciplinary panel can be constituted to benefit from the presence of at least one and possibly two people with some knowledge of the difference between clinical medicine and forensic pathology. Whether it was connected with the structure of the process or not, the U.K. General Medical Council clearly had difficulties in dealing with the case of Professor Meadow,[63] difficulties that were adversely commented upon by the High Court. The GMC did not appeal the decision of the High Court overturning it's finding that Professor Meadow was not fit to practise.

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[62]While there would be ethical responsibilities to do so in some circumstances, these carry with them considerable personal risks, including legal liability.

[63] See S. Cordner, "The Sally Clark case, Professor Meadow and the GMC" 37(2) *Australian Journal of Forensic Sciences* 87–100.

It is not evidence-based, but there seems to be an increase in the number of forensic pathologists appearing before disciplinary tribunals, and a process that does not take account of the "paradigm shift" between clinical and forensic practice runs the risk of losing the confidence of those being regulated by the process. At the moment, the Home Office process in the U.K. is additional to that of the General Medical Council. While forensic pathology has to accept scrutiny, steps need to be taken so that when the work of forensic pathologists is being evaluated for disciplinary purposes, those charged with this task include one or more of those familiar with and competent in forensic pathology.

Perhaps connected with this (possible) trend to the increased use of disciplinary processes is the portrayal of medicine generally, and forensic medicine and science, in the media and mass entertainment industries. The impression left is of medical science being able to cure most disease, and, in the more recent profusion of forensic science and forensic medicine drama, of the latter being able to ascertain with certainty the causes and circumstances of death. These portrayals sometimes occur with the support of medicine and the forensic disciplines. The expectations created are unrealistically high, and therefore the opportunities for disappointment are that much greater. This places an additional burden of communication on medicine and forensic pathology, respectively, to educate patients and the justice system.

Testimony

Most pathologists are aware that their primary duty is to the court, not to the party calling them. Certainly the expert is not an advocate—but if a key characteristic of the expert is that s/he is independent, this must mean that s/he can act independently. Constraints on the independent pathologist would generally be constraints imposed by a party with respect to the confidentiality of information and probably not constraints imposed by the court.

The Code of Practice and Performance Standards for Forensic Pathologists in the U.K., published by the Home Office Advisory Board for Forensic Pathology and the Royal College of Pathologists, sets out the following in relation to attendance at court:

> The pathologist must:
>
> a) ensure that he is well prepared prior to attendance at court to give evidence
>
> b) ensure that all documentation relevant to the case is brought to court
>
> c) ensure that appearance and behaviour conform to acceptable professional standards
>
> d) deliver evidence in an audible and understandable manner
>
> e) give evidence consistent with the contents of the written report
>
> f) deal with questions truthfully, impartially and flexibly
>
> g) identify questions that are unclear and clarify these before offering a response
>
> h) give answers to technical questions in a manner understandable by those who have no technical or scientific training
>
> i) differentiate between facts and conclusions drawn from those facts, and ensure that any such conclusions lie within his or her field of expertise
>
> j) consider additional information or alternative hypotheses that are presented, and where warranted modify conclusions already drawn
>
> k) where it appears that a lawyer has misunderstood or is misstating evidence, ensure that the court is made aware of that misunderstanding or misstatement.[64]

This analysis of the role of the forensic pathologist as a witness expands the responsibility of the witness considerably. The more traditional view of the witness as a passive participant answering the questions as they are put, is replaced by a much more active participant ensuring to a much greater

[64] www.rcpath.org.

extent that the evidence s/he possesses is both presented properly, and also understood, by the court. This is a development welcomed by pathologists from the model forensic pathology service.

6. Standards in Forensic Pathology

Introduction

Standards will generally be related to process: it is difficult to establish a standard that you will see myocarditis in a microscopic slide of heart because there might be reasonable debate about the existence of myocarditis in that particular slide. It is possible to set a standard that you will look at histology slides, and that you will record the results of looking at the slides. But contrary to the popular view, such a standard does not ensure that diagnoses or conclusions (e.g., homicide as opposed to suicide) will be uniform, let alone correct. When such standards are adopted, they can ensure that certain processes have been followed, and this is a valuable achievement. Another valuable aspect of process-oriented standards is that conformity with them can be measured. It is more difficult to evaluate and measure performance on the basis of diagnoses made and conclusions drawn.

What are standards for?

Standards can be created for a variety of purposes.

- Evaluation of an organization against a raft of process-related standards. An example of this is accreditation. Accreditation of an organization, that is, certification that the organization meets a set of process-related standards, does *not* mean that any particular result or conclusion produced by the organization is necessarily valid. It means that the organization takes its responsibilities seriously enough to organize itself around meeting the standards, and is prepared to subject itself to external scrutiny and assessment in this regard.
- Evaluation of the processes leading to the production of an autopsy report in criminal or coronial proceedings. The standards may thus be used as the basis of questioning of a pathologist by a barrister in a trial.

- Assisting the evaluation, or internal audit, by an organization of its own performance.
- Evaluating the performance of an individual forensic pathologist in a regulatory or disciplinary setting. Standard setting for this use is extremely difficult and often, ultimately, relies upon the judgment of peers if the area in dispute is a technical or knowledge-based issue of competence. In relation to ethics or behavioural issues, these are more readily evaluated in accordance with community standards.

Many of the well-known textbooks are also de facto standards.[65] They often contain chapters on the processes around medico-legal death investigation that can form the basis of evaluating a particular case. They also use the case experience of the authors to illustrate the concepts and issues discussed. This is the closest the literature gets to standards that could be applied to conclusions made by forensic pathologists in particular cases. An example of material actually published as a standard includes *Code of Practice and Performance Standards for Forensic Pathologists* from the Home Office Policy Advisory Board for Forensic Pathology and The Royal College of Pathologists.[66] Adherence to the code is an "essential requirement of being registered by the Home Office as licensed to practise forensic pathology in England and Wales."[67] Departures from the code must be able to be justified. Of particular importance in the code are the following:

- personal expertise: keeping up to date with the latest methods and thinking, by, for instance, actively pursuing relevant continuing professional development programmes
- standards: accepting the use of agreed documented procedures and participating in appropriate schemes of peer review and audit
- integrity of evidence: ensuring that the integrity of the evidence is not compromised

[65] See list at the end of Appendix 3 for a number of these.
[66] November 2004, www.rcpath.org.
[67] Footnote supra; Page 1.

- ensuring the fair presentation of findings: presenting findings and evidence in a balanced and impartial manner, and confining opinions to those based on personal skills and experience, referring to the work of other experts in the field where appropriate
- understanding the criminal justice system: recognising the importance of the disclosure of information to relevant parties
- service provision: the pathologist will address, and, where possible, meet customer needs, including timeliness, providing relevant information and communicating effectively with police officers and others in the investigative process.

All pathologists have a duty to consider and investigate explanations for a death consistent with the innocence of an accused person. Where such an explanation cannot be excluded, it must be brought to the attention of the pathologist's instructing party.[68]

The remainder of the code is unexceptional in its requirements of pathologists, although in places it borders on avoiding the creation of standards: incisions should be appropriate to the nature of the case; all organs must be dissected and accurately and adequately described with weights; other measurements should be recorded as appropriate. These examples, which are quite general, indicate that standards in these areas (and there are other examples in the document) will rely upon the proper education and training of the pathologist to ensure familiarity with proper practice, and then peer judgment to assess if the standard has been met if there is an issue to be assessed subsequently.

Another published standard is the *Forensic Autopsy Performance Standards* of the National Association of Medical Examiners of the United States, published in 2005. The main object of these standards "is to provide a constructive framework that defines the fundamental services rendered by a professional forensic pathologist practising his or her art. Many forensic pathologists will exceed these minimal performance levels and are encouraged to do so." It is very process-oriented, and like the

[68] Footnote supra: Page 2.

Home Office/Royal College of Pathologists document, quite brief at 20 pages. Section H is entitled "Documentation and Reports" and contains the following:

> The purpose of this section includes standards for the content and format of the post mortem record.
>
> Postmortem Examination Report
>
> Postmortem inspection and forensic autopsy reports must be readable, descriptive of findings, and include interpretations and opinions to make them informative. The report typically includes two separate parts of the forensic pathologist's work product, (1) the objective forensic autopsy with its findings including toxicological tests, special tests, microscopic examination, etc, and (2) the interpretations of the forensic pathologist including cause and manner of death.
>
> The forensic pathologist shall:
>
> H31.1 prepare a written narrative report for each post-mortem examination
>
> H31.2 include the date, place and time of examination
>
> H31.3 include the name of the deceased, if known
>
> H31.4 include the case number
>
> H31.5 include observations of the external examination, and when performed, the internal examination
>
> H31.6 include a separate section on injuries
>
> H31.7 include a description of internal and external injuries
>
> H31.8 include description of findings in sufficient detail to support diagnoses, opinions and conclusions
>
> H31.9 include a list of the diagnoses and interpretations in forensic autopsy reports
>
> H31.10 include cause of death

H31.11 include manner of death

H31.12 include the name and title of each forensic pathologist

H31.13 sign and date each post-mortem report

This is helpful as far as it goes. It would have been a reference point in the U.S.A. for an exercise such as that undertaken by the Chief Coroner's Review, which preceded this Inquiry. However, satisfactory performance against these criteria would still be compatible with the practice of bad forensic pathology. That is a comment which is easy to make, but hard to do anything about. The core output of forensic pathology, the opinion, be it the opinion about the cause of death or the manner of death, is not easily reduced to written standards. In relation to this consider the following.

Conclusions/opinions in forensic pathology are difficult to standardize

Twenty-three succinctly described classical forensic pathology situations were presented, eliciting 198 responses from the more than 700 physician medical examiners/coroners who were the members of the National Association of Medical Examiners. The manner of death inferred from the ICD Code that was assigned by the National Centre for Health Statistics matched the most common response of participants in 18 (78%) of the 23 scenarios. Table 6 shows the percentage of agreement for the most popular conclusions (homicide, suicide, accident, natural, undetermined, other/blank).

Table 6—Percentage agreement among 198 physician medical examiners/coroners on the most popular manner of death in 23 scenarios

%	No. of cases
41–50	2
51–60	4
61–70	5

71–80		1
81–90		7
91–100		4
		—
	Total	23

In fewer than half the cases, admittedly chosen because they were at the boundary of different manners of death, was there greater than 80% agreement. In other words, in only 11 out of 23 cases did more than 80% of 198 physician medical examiners agree on the manner of death? There was considerable diversity of opinion amongst the relevant experts as to the manner of death in these examples. This points to the existence of reasonable differences of opinion, but also to different understandings, even on the same facts, of the criteria to establish particular manners of death.[69] The "standards" approach to this level of operation of any forensic pathology system is best focused on education and discussion of cases with peers and others.

Current standards

Amongst the different standards relevant to the VIFM are:

- NATA/RCPA Medical Testing, which assesses/accredits the VIFM in accordance with Australian Standard 4633/ISO 15189 Medical Laboratories;
- NATA Forensic Operations Module, which is supplementary to the above;
- National Pathology Accreditation Advisory Council Guidelines for the Facilities and Operations of Hospital and Forensic Mortuaries;
- National SIDS autopsy protocol; and

[69] R. Hazlick and J. Goodin, Mind Your Manners, Part III, "Individual Scenario Results and Discussion of the National Association of Medical Examiners Manner of Death Questionnaire, 1995" (1997) 18(3) T*he American Journal of Forensic Medicine and Pathology* 228–245.

- VIFM internal operation manuals and standard operating procedures.

These standards are all process-centred. The National SIDS Autopsy Protocol is an interesting example. This is a comprehensive protocol listing all the observations to be made during the autopsy and enabling the recording of all the special tests undertaken and their results. What the protocol cannot do is set the standard, for example, of how much inflammation in the bronchioles or alveoli is sufficient to constitute the diagnosis of bronchiolitis or pneumonia, or how much bronchiolitis or pneumonia might be sufficient to account for a death in the circumstances of the case. Assurance of quality at this level is left to peer review processes.

7. Conclusion

We have tried to outline, on a principled basis, a credible forensic pathology service. We are naturally influenced by our own experience. There will be local history and realities that will affect the reception and perception of what we have written. We encourage the steadfast that have read this far to think in terms of the purposes of the death investigation system, of the services needed to meet those purposes, and the principles by which those services should be delivered. The same approach could then be applied to the core discipline of death investigation to design a model forensic pathology service. The model service will be delivered by an institution, independent of police, courts, and coroners, created for the purpose and with legislated functions, including the function of providing specified services to the coroner. The model service will be a credible one because it will be both responsible and accountable for the service. The accountability for the service and its quality is exercised through the Director of the service to a Board. The Board, strengthened by including membership from the judiciary, in turn is directly accountable to the Attorney-General and, through him/her, to Parliament.

The model service will have within it sufficient numbers of properly trained staff to undertake the work required, who believe in the value of what they do and understand the ethical and legal framework within which they work. They will work within a culture that appreciates the importance of peer review and continuous learning, including research and teaching. For this purpose the model service will have a presence within the university sector. The staff, which are valued by the model service, will appreciate the model facilities that have been provided, reinforcing the significance the community attaches to what they do on its behalf. In this way, and through observance of the various quality assurance mechanisms, there will be a reliable evaluation of all the death types referred to the service, including pediatric deaths. It is impossible to eliminate all risk of error, but there will be processes designed to minimize the occurrence of avoidable errors.

The model service will be fully engaged with forensic pathology nationally, both in a professional sense, and by being able to provide advice to the defence (and to parties to matters outside the criminal jurisdiction) in cases across the country. A strong forensic pathology profession nationally will provide support to a Criminal Cases Review Commission upon request. A side-product of such a comprehensive approach may be the delivery to the community of the many other benefits associated with a model forensic pathology service.

APPENDIX 1

Development of the VIFM Model

One example of a professional forensic pathology service is the Victorian Institute of Forensic Medicine (VIFM). The VIFM was created, after a considerable period of gestation, by the passage of the Victorian *Coroners Act 1985*. It has now been in existence for 20 years and continues to review and refine its area of practice. At the time of writing, the Institute is involved in a review of its founding legislation, which will result in amending legislation being introduced in the 2008 Parliamentary year.

The organizational relationships with government, Victoria Police, and universities that were created with the establishment of the Victorian Institute of Forensic Medicine were not accidental. These relationships were very much the focus of the group of pathologists who lobbied successive state governments over 15 years for an independent institute of forensic medicine—an institute staffed by people devoted to the pursuit of excellence and housed in a purpose-built building. This political activism was fired by the frustration of working in appalling conditions at the old Melbourne city mortuary where families, staff, lawyers, and police had to share the crowded foyer to the Coroners Court, mortuary, and identification room. In addition to the inadequate physical facilities, concerns had been expressed about the standard of medico-legal post-mortem reports and that the valuable teaching and research material from the deaths being reported to coroners was being largely lost to medicine and to the community as a whole.

A further review of the standards of forensic pathology in Australia conducted for the Royal College of Pathologists of Australasia in 1973 and 1974 identified the problem in Victoria of obtaining training in forensic pathology. "*A vicious cycle exists in that no one will undertake training in Melbourne until conditions improve and conditions will not improve until trained people are available.*"

The Attorney-General established The Coroners Court Review Committee in 1975 to examine the future needs for post-mortem examinations and coronial cases in Victoria. The Committee recommended, amongst other things, that

- the coroner is not in the best position to choose the medical practitioner to perform the autopsy;
- all autopsies should be performed by or under the direct supervision of a qualified pathologist with access to ancillary services for toxicological, serological, histopathological, microbiological, and radiological support;
- the full-time staff would need to be supplemented by sessional specialist pathologists, including a consultant pediatric pathologist, and surgical, radiological, and dental consultants;
- no specialist forensic pathologist should function in isolation from medical undergraduate and post-graduate teaching; and
- the Coroner's courtroom and associated public areas should be removed from the sight, sound, and smell of the mortuary.

An Inter-Departmental Committee (IDC) oversaw the implementation of the report's recommendations. The Committee included representation from the Law Department, Treasury, the Department of Premier and Cabinet, the Health Commission, Victoria Police, and the Department of Pathology at Geelong Hospital.[70] The majority of IDC members recommended that all forensic science services for both the Coroner and the police should be integrated in one building and administered independently of the Coroner and the police. This proposal envisaged the forensic science unit to be neutral and centralized, staffed by civilians, whose objective was to serve the police, the Coroner, the legal profession, defence and prosecution, the medical profession, and the public as a

[70] Any project of this kind needs a champion, and it was Dr. Vern Plueckhahn, Director of Pathology at the Geelong Hospital, who provided the inspiration and energy to drive his vision through to success.

whole. Victoria Police were opposed to this recommendation and the government decided to establish police forensic services separate to and independent from the coronial forensic services.

The IDC recommended that the VIFM be formally affiliated with both major universities in Victoria—University of Melbourne and Monash University—and that the Director of VIFM should occupy a shared Chair in Forensic Pathology and thus be given professorial status. This was seen as an essential relationship so that the Institute could carry out its responsibilities in undergraduate and post-graduate teaching and training. The nature of forensic pathology is such that the service does not require a large number of medical practitioners in any particular jurisdiction. However, a continuous supply of a small number of experienced and well-trained medical practitioners is needed. In this respect, undergraduate and post-graduate teaching, together with affiliation with medical schools and the appropriate post-graduate medical colleges, is an important part of a forensic pathology service. Undergraduate and post-graduate training in medicine is supervised by a medical school whose focus is, of course, on the production of competent medical practitioners for the community. Because only a few forensic pathologists are required, there is little emphasis on this area within the medical undergraduate curriculum and this is probably appropriate. It is in the area of post-graduate training that forensic pathology training programs come into their own.

At the end of 1984 the Council of Monash University and the Attorney-General entered into an agreement for the establishment of a Chair of Forensic Medicine, which was to be occupied by the Director of VIFM. The University of Melbourne did not support the notion of a shared Chair, but agreed to formal affiliation with the Institute in 1988 for the purposes of promoting teaching of undergraduate and post-graduate students and to promote research.

Finally the IDC recommended that the VIFM be governed by a Council of 10 part-time members who would represent the Institute's stakeholders. An interim Council was appointed in 1984 and was charged with the task of appointing a Director and Professor of Forensic Medicine for the

proposed Institute. Part 9 of the *Coroners Act 1985* (which establishes VIFM)[71] came into operation on 12 February 1986 and the first meeting of the statutory Council was held on 27 May 1986. Its members included the State Coroner and nominees of the Chief Justice, the Attorney-General, the Minister for Health, the Minister for Police and Emergency Services, the University of Melbourne, and Monash University.

Today the VIFM employs not only several full-time forensic pathologists but also part-time anatomical pathologists, including subspecialists from areas such as neuropathology and pediatric pathology.[72] Access is available to photography, radiology, physical anthropology, forensic odontology, and entomology. Separate laboratories for toxicology, histology, microbiology, and molecular biology are on-site. The mortuary is staffed by scientists and technicians, with the manager having a Ph.D. that she obtained while working in the mortuary, studying trauma to the cervical spine in road traffic fatalities. Ready access to the Forensic Services Department of Victoria Police, with whom we have a Memorandum of Understanding, exists, as do the most cordial of relations. This interdisciplinary team-based approach reflects the multiplicity of the fields and the breadth of the knowledge, skills, competencies, experience, and facilities required to provide the comprehensive forensic pathology service expected by the Australian community.

[71] See Appendix 2.
[72] Our pediatric pathologist, employed 0.4 EFT since 1990, retired on 30 June 2007. We are discussing with the Royal Children's Hospital how to fill this gap.

APPENDIX 2

CORONERS ACT 1985. Part 9—Victorian Institute of Forensic Medicine

(Selected sections)

64 Establishment and objects of the Institute

(1) The Victorian Institute of Forensic Medicine is established.

(2) The objects of the Institute are as follows—

(a) to provide, promote and assist in the provision of forensic pathology and related services in Victoria and, as far as practicable, oversee and co-ordinate those services in Victoria;

(b) to promote, provide and assist in the post-graduate instruction and training of trainee specialist pathologists in the field of forensic pathology in Victoria;

(c) to promote, provide and assist in the post-graduate instruction and training of persons qualified in biological sciences in the field of toxicological and forensic science in Victoria;

(d) to provide training facilities for doctors, medical undergraduates and such other persons as may be considered appropriate by the Council to assist in the proper functioning of the Institute;

(e) to conduct research in the fields of forensic pathology, forensic science, clinical forensic medicine and associated fields as approved by the Council;

(f) to provide, promote and assist in the provision of clinical forensic medicine and related services to the police force of Victoria and government bodies;

(g) to promote, provide and assist in under-graduate and post-graduate instruction in the field of clinical forensic medicine in Victoria;

(h) to promote, provide and assist in the teaching of and training in clinical forensic medicine within medical, legal, general health and other education programs;

(i) to provide tissue banking facilities and services referred to in section 66(4).

65 The Institute to be a body corporate

(1) The Institute—

(a) is a body corporate with perpetual succession; and

(b) has a seal; and

(c) may acquire, hold and dispose of real and personal property; and

(d) may sue and be sued in its own name; and

(e) may seek and accept funds from the University of Melbourne, Monash University or any other person for the purposes of carrying out the objects of the Institute.

(2) All courts, judges and persons acting judicially are to take judicial notice of the seal of the Institute.

66 Functions of the Institute

(1) Subject to the directions of the State Coroner, the functions of the Institute are as follows—

(a) to provide facilities and staff for the conduct of examinations in relation to deaths investigated under this Act;

(b) to conduct chemical, microscopic, serological, toxicological and other examinations of tissue and fluids taken from deceased persons coming under the jurisdiction of coroners in Victoria;

(c) to identify by radiological or odontological examination or other means the remains of deceased persons whose deaths are being investigated under this Act;

(d) to conduct other appropriate investigations or examinations in relation to the cause of death of any person;

(e) to properly document and record findings and results of investigations and examinations;

(f) to provide reports to coroners about the medical causes of deaths and the findings and results of investigations and examinations.

* * * * *

(2)The Institute also has a function to ensure the provision of clinical forensic medical services to the police force of Victoria and government bodies in accordance with agreements for services between those bodies and the Institute.

(3) The Institute also has a function to investigate, assess and instigate appropriate responses in respect of—

(a) the health or safety of a living sibling of a deceased child; and

(b) the health of a parent of a deceased child—

where the death of that child constitutes a reviewable death.

(4) The Institute also has the following functions—

(a) to receive tissue taken in accordance with the **Human Tissue Act 1982** (whether under Part X of that Act or otherwise) from living persons in

Victoria and to process, store and supply the tissue for transplantation to living persons in Victoria or elsewhere or for use, in Victoria or elsewhere, for other therapeutic purposes or for medical or scientific purposes;

(b) to remove tissue, or receive tissue taken, in accordance with the **Human Tissue Act 1982** from deceased persons in Victoria (whether or not a coroner has jurisdiction to investigate the deaths) and to process, store and supply the tissue for transplantation to living persons in Victoria or elsewhere or for use, in Victoria or elsewhere, for other therapeutic purposes or for medical or scientific purposes;

(c) to remove tissue, or receive tissue taken, in accordance with a corresponding law of another State or a Territory and to process, store and supply the tissue for transplantation to living persons in Victoria or elsewhere or for use, in Victoria or elsewhere, for other therapeutic purposes or for medical or scientific purposes;

(d) to receive tissue taken in accordance with a corresponding law of a country other than Australia and to process, store and supply the tissue for transplantation to living persons in Victoria or elsewhere or for use, in Victoria or elsewhere, for other therapeutic purposes or for medical or scientific purposes.

66A Powers of the Institute

(1) The Institute may do all things necessary or convenient to be done for, or in connection with, or as incidental to, the performance of its objects and functions.

(2) Without limiting subsection (1), the Institute has power to—

(a) enter into agreements for services provided by the Institute;

(b) impose fees and charges for the provision of services.

(3) Without limiting subsection (1), the Institute has power in respect of the functions specified in section 66(1) to—

(a) collect, use and disclose personal information and health information;

(b) advise the State Coroner as to whether a reviewable death requires further investigation.

(4) Without limiting subsection (1), the Institute has power in respect of the function specified in section 66(3) to—

(a) collect, use and disclose personal information and health information;

(b) advise the State Coroner as to whether a reviewable death requires further investigation;

(c) consult the family and other persons, including a health service provider, to assess the family's need for health and support services;

(d) refer the family to health and support services;

(e) assess whether a report under section 183 of the **Children, Youth and Families Act 2005** should be made in relation to any living siblings of the deceased child;

(f) make a report under section 183 of the **Children, Youth and Families Act 2005** in relation to any living siblings of the deceased child;

(g) advise the State Coroner that the Institute has made a report under section 183 of the **Children, Youth and Families Act 2005** in relation to any living siblings of the deceased child.

(5) Despite any other Act or law, a person to whom a request is made under subsection (3) or (4) is authorised by this section to provide the information requested by the Institute.

(6) In this section—

health information has the same meaning as in section 3(1) of the **Health Records Act 2001**;

health service provider has the same meaning as in section 3(1) of the **Health Records Act 2001**;

personal information has the same meaning as in section 3 of the **Information Privacy Act 2000**.

Example

The Institute may exchange personal information or health information with persons such as the family's general practitioner or the maternal and child health nurse.

67 The Council[1]

(1) The governing body of the Institute is the Victorian Institute of Forensic Medicine Council.

(2) The Council consists of—

(a) the State Coroner; and

(b) the Director of the Institute; and

(c) a nominee of the Council of the University of Melbourne; and

(d) a nominee of the Council of Monash University; and

(e) a nominee of the Minister for the time being administering the **Health Services Act 1988**; and

(f) a nominee of the Minister for the time being administering the **Police Regulation Act 1958**; and

(g) a nominee of the Chief Justice; and

(h) two nominees of the Attorney-General, at least one of whom is to be a Fellow of the Royal College of Pathologists of Australasia; and

(i) a nominee of the Chief Commissioner of Police; and

(j) a nominee of the Minister for the time being administering Part II of the **Community Services Act 1970**; and

(k) a nominee of the Minister for the time being responsible for women's affairs in Victoria.

(3) The Attorney-General must appoint one of the members as Chairperson.

68 Director

(1) The person who holds the Chair of Forensic Medicine at Monash University is the Director of the Institute.

(2) If no one holds the Chair, the Governor in Council may appoint a person to act as Director on the terms and conditions in the instrument of appointment.

(3) The Director must carry out the objects of the Institute under the direction of the Council.

(4) An Acting Director may be re-appointed.

69 Members of the Council

(1) The members of the Council, other than the Director and the State Coroner, are to be appointed by the Governor in Council on the terms and conditions in the instrument of appointment.

(2) A member, other than the Director or the State Coroner, holds office for three years or for the shorter period stated in the instrument of appointment.

(3) The **Public Administration Act 2004** (other than Part 5 or except in accordance with Part 7 of that Act) does not apply to a member in respect of the office of member.

70 Procedure of the Council

(1) The Chairperson has a deliberative vote and, in the case of a tie, has a second or casting vote.

(2) The Council may regulate its own proceedings.

71 Officers of the Institute

(1) The Institute may employ any person it considers necessary to carry out the objects of the Institute.

(2) For the purpose of long service leave, an employee of the Institute who, immediately before appointment, was an employee under Part 3 of the **Public Administration Act 2004** must, subject to that Act, be taken to continue to be an employee under that Act while an employee of the Institute.

(3) An employee of the Institute who, immediately before appointment, was an officer within the meaning of the **State Superannuation Act 1988** continues, subject to that Act, to be such an officer while an employee of the Institute.

72 Director may act as consultant

With consent of the Council, the Director may act as a consultant in relation to any matter which has not been investigated and which a coroner is unlikely to investigate.

73 Director's duties relating to autopsies

If a coroner directs the Institute to perform an autopsy on a body under section 27, or the Supreme Court orders the State Coroner to require the Institute to perform an autopsy on a body under section 28, the Director must—

(a) ensure that an autopsy is performed; and

(b) report the results of the autopsy to the coroner or State Coroner; and

(c) keep a record of the autopsy.

74 Change in Institute's name

(1) On and from the commencement of this section—

(a) the name of the Victorian Institute of Forensic Pathology is to be the Victorian Institute of Forensic Medicine;

(b) in an Act, a subordinate instrument within the meaning of the **Interpretation of Legislation Act 1984** or any document whatever a reference to the Institute by its old name is, in relation to any period occurring on or after that date of commencement, and unless inconsistent with the context or subject matter, to be deemed to be a reference to the Institute by its new name.

(2) The Institute continues to be the same body after as before its change of name and no act, matter or thing is affected by that change.

75 Validation of past conduct of the Victorian Institute of Forensic Medicine

(1) Anything done or purported to be done under this Act by the Institute before the commencement of section 17 of the **Coroners (Amendment) Act 1999**, that would have been validly done had section 16 of the **Coroners (Amendment) Act 1999** been in operation at the time at which the thing was done or purported to have been done has, and is deemed always to have had, the same force and effect as it would have had if that section had been in operation at the time at which the thing was done or purported to have been done.

(2) Anything done or purported to be done under this Act before the commencement of section 7 of the **Coroners and Human Tissue Acts (Amendment) Act 2006**, that would have been validly done had that Act been in operation at the time at which the thing was done or purported to have been done has, and is deemed always to have had, the same force and effect as it would have had if the **Coroners and Human Tissue Acts (Amendment) Act**

2006 had been in operation at the time at which the thing was done or purported to have been done.

APPENDIX 3

The following is extracted from the

Forensic Pathology section of the Trainee Handbook of the Royal College of Pathologists of Australasia

INTRODUCTION

Forensic Pathology is the subspecialty of Pathology that focuses on medicolegal investigations of sudden or unexpected death. Forensic pathologists have a critical and pivotal role in death investigation, examining the body of the deceased to define the cause of death, factors contributing to death and to assist with the reconstruction of the circumstances in which the death occurred. As with all medical consultations the diagnostic process involves the forensic pathologist integrating evidence from the deceased's medical history, the supposed circumstances surrounding the death, the findings of post-mortem medical examination (autopsy) and the results of laboratory investigations undertaken as part of the autopsy. A post-mortem examination typically involves careful examination of the external appearances of the body of the deceased, and dissection of internal organs and structures. A sound knowledge of anatomical pathology is essential, particularly as microscopic assessment of body tissues is often needed to enable a precise diagnosis. Forensic pathologists work closely with other death investigators including Coroners, police and forensic scientists; they may be required to attend scenes of death and are often required to testify in court.

PERSONAL CHARACTERISTICS NEEDED

A forensic pathologist needs the following:

- broad medical experience, preferably including post-graduate experience in paediatrics, anaesthetics and obstetrics/gynaecology
- sound knowledge in anatomical pathology
- good communication and interpersonal skills
- a methodical and analytical approach
- ability to practise as part of a team as well as autonomously
- a high level of self-motivation
- ability to formulate and articulate well-balanced views
- patience (as it is often slow, painstaking work)
- emotional stability
- an understanding of aspects of bereavement

- enjoyment of the scientific basis of medicine
- teaching skills
- an inquiring mind, to initiate ethical research

AIMS OF THE TRAINING PROGRAM

The “Outcomes of Training” and the “Knowledge and Experience to be Attained” are elucidated in the RCPA Forensic Pathology Curriculum (see below).

In brief, at the time Trainees complete the requirements for Fellowship they should:

- have a sophisticated understanding and perspective of Forensic Pathology and its role in death investigation
- be able to independently examine and report macroscopic and microscopic findings at post-mortem examination of all types of Coroners cases
- be able to integrate subjective (i.e. history) and objective (i.e. post-mortem findings and laboratory investigation results) information about cases, to provide a well-balanced opinion to Courts, the Coroners and authorised investigators
- be able to clearly distinguish observation of fact from interpretation and opinion
- have sound knowledge of the legislative basis and ethical issues of forensic medical practise, being an effective advocate on behalf of the deceased
- be able to liaise with other medical and scientific specialists, with a clear understanding of their expertise
- understand, and regularly reflect upon, the limitations of forensic medical practise
- understand and promote the value of post-mortem examination of the deceased in the provision of quality health care
- have a working knowledge of mortuary and laboratory management, particularly recognising and advocating maintenance of Quality and OH+S procedures
- participate in, and be an advocate for, continuing professional development of all staff
- participate in teaching to trainees in Forensic and Anatomical Pathology.

At the final assessment (Part II) in Forensic Pathology, candidates should be aware that they are required to convince the Board of Censors, through the panel of examiners, that they have sufficient knowledge and experience for “the safe and unsupervised practise of forensic pathology”, and that they are ready for appointment to a position as a specialist medical consultant.

FORENSIC PATHOLOGY CURRICULUM

Knowledge and Experience to be Attained in Forensic Pathology

A sound knowledge of Anatomical Pathology is essential to practice as a Forensic Pathologist. Accordingly at least half of the training time is to be spent in accredited departments of Anatomical Pathology (AP). The Part I examination will be the AP I examination—refer to *Knowledge and Experience to be Attained in Anatomical Pathology*.

The following ***knowledge*** and ***experience*** requirements are to be read in conjunction with the *Table of Tasks, Learning Outcomes, Activities and Assessment in Forensic Pathology*, below:

MINIMUM NUMBER OF SPECIFIC EXPERIENCES FOLLOWING AP I

150–200 Coronial autopsies per year

10 homicide autopsies, including some as primary investigator (Local legislation, e.g. Victoria, may require these autopsies to be performed under supervision)

15 death scenes, including some as primary investigator

30 hrs toxicology

DEATH INVESTIGATION

1. The Trainee should have a high level of competence in
    a. The pathology of sudden natural death
    b. Investigation of homicides, suicides and accidental deaths
    c. The pathophysiology of death
    d. Methods of assessment of time since death
    e. The classification, pathology and complications of injuries/wounds
    f. Head and spinal injuries
    g. Chest and abdominal injuries
    h. Self inflicted injury
    i. Gunshot and explosive injuries and deaths
    j. Transport and work-place related injuries and deaths
    k. Injuries and deaths following falls

l. Injuries and deaths in custody (including restraint deaths)
m. Burns and scalds (including injuries and deaths following fire)
n. Electrical injuries and fatalities
o. Injuries and deaths associated with “asphyxia” and neck compression
p. Immersion related injuries and deaths
q. The pathology of neglect, starvation and hypothermia
r. Injuries and deaths associated with sexual offences
s. Pathology and deaths associated with pregnancy
t. Injuries and pathologies associated with infanticide and still-births
u. Sudden death in infancy
v. The various forms of fatal child abuse and related injuries
w. The investigation and evaluation of deaths associated with surgical procedures
x. The investigation and evaluation of deaths due to adverse medical events
y. The investigation and evaluation of deaths due to anaesthesia
z. The investigation and evaluation of scuba diving deaths
aa. Evaluation of taphonomic/post mortem changes
bb. Establishing the identity of human remains
cc. Identifying, discussing and evaluating patterns of injury

2. The Trainee should have 3 to 6 months training in paediatric pathology
3. The Trainee should have some training in Clinical Forensic Medicine
4. The Trainee should be knowledgeable in
    a. Establishing the identity of human remains
    b. Human rights investigations e.g. investigation of mass graves, war crimes, & crimes against humanity
    c. Forensic toxicology
        i. sample section and preservation
        ii. post-mortem toxicology especially post-mortem redistribution
        iii. toxicology of alcohol
        iv. poisonings including Carbon monoxide, agrochemicals, medicines, narcotics, hallucinogens, corrosives, heavy metals and solvents
5. The Trainee should understand the principles and work with experts in

a. Clinical pathology (e.g. microbiology, immunology, clinical biochemistry) to a reasonable level applicable to forensic practice
b. Forensic anthropology
c. Forensic odontology
d. Forensic entomology
e. Forensic radiology
f. Forensic science
    i. handling of evidence,
    ii. ballistics,
    iii. blood spatter,
    iv. DNA/Molecular biology
    v. Fingerprints

6. The Trainee should be proficient in the following dissection techniques
    g. Evisceration and block dissection including head and neck
    h. Organ by organ dissection
    i. Removal of the brain & spinal cord in continuity
    j. Dissection of the brain, fresh and fixed
    k. Vertebral artery dissection
    l. Facial dissection
    m. Removal of the orbital contents (anterior & posterior approach)
    n. Dissection of the middle ear
    o. Anterior & posterior layer by layer neck dissection.
    p. Cardiac dissection, standard, line of flow and conduction system
    q. Dissection of Superior vena cava, subclavian and jugular veins
    r. Subcutaneous dissection of trunk and limbs for occult bruising
    s. Subcutaneous dissection for intravenous needle marks
    t. Dissection of lower limbs and pelvis for deep vein thrombosis
    u. *In situ* dissection of the vagina/rectum for sexual assault
    v. Special paediatric and neonatal techniques
7. The Trainee should have a broad knowledge of the principles of Medicine relating to
    a. Forensic Medicine

b. Medicine, medical treatment and procedures particularly cardiology
c. Surgery, procedures and complications, particularly cardiothoracic and neurosurgery
d. Paediatrics particularly SIDS, congenital (including genetic) disease and child abuse
e. Anaesthetics particularly death during anaesthesia
f. Obstetrics relating to maternal and perinatal death
g. Emergency medicine particularly acute treatment of trauma
h. Psychiatry in relation to suicide, mental illness and death in care
i. Occupational & Public medicine in relation to death & injury prevention.

8. In addition to that required to pass API the Trainee should have a high level of competence in Forensic Histopathology particularly
    a. Histopathology of injuries, aging of injuries, healing and complications
    b. Cardiac histopathology of forensic significance
    c. Neuropathology of forensic significance
    d. Histopathology of pneumonias and industrial lung diseases
    e. Identification of micro-organisms of forensic significance
    f. Histopathology of intravenous & other drug use
    g. Histopathology of metabolic diseases.
9. The Trainee should have a though knowledge of artefacts which can be mistaken for ante and peri-mortem injury or disease
10. The Trainee should have a high level of knowledge regarding workplace health and safety in the mortuary in relation to infection control, and adverse psychological reactions in mortuary staff.
11. The Trainee should be competent to advise police, forensic scientific staff and the coroner at death scene examination in regard to
    a. Time since death including limitations
    b. Recovery of trace evidence on the body
    c. Re-creation of the circumstances of death
    d. DVI procedure
    e. Exhumation
    f. Handling the remains and related material

12. The Trainee should have a high level of knowledge of the law relation to forensic medicine particularly
    a. The Coroners Act
    b. Human Tissue Act (or relevant act)
    c. Relevant Criminal law, including structure of the legal system, principles of criminal law including *mens rea* and *actus reus*, homicide law (including child destruction and abortion) together with the relevant defences, the law relating to assault
    d. Courts
    e. Rules of expert evidence
    f. Report writing
13. The Trainee should have a strong grounding in ethical principles relating to
    a. Consent
    b. Organ retention
    c. Privacy
    d. Investigation of deaths in custody
    e. Provision of second opinions
    f. Investigation of war crimes, politically motivated deaths & crimes against humanity.
14. The Trainee should understand the importance of interaction with the family of the deceased in regard to
    a. Counselling in relation to bereavement
    b. Understanding loss and grief
    c. Providing relevant information arising from the autopsy, and
    d. Critical incident stress reactions
15. The Trainee must recognise their importance in death and injury prevention.
16. The Trainee must learn to use information technology systems to store and retrieve data and information for case related and research purposes and to educate the coronial system, the courts, families and the public.
17. The Trainee should be committed to the advancement of ethical research in Forensic Pathology and Medicine.

TABLE OF LEARNING OUTCOMES, ACTIVITIES AND ASSESSMENT

See over. This table must be read in conjunction with the *Generic Curriculum*, at the front of this Handbook, and *Knowledge and Experience to be Attained*, above.

Tasks	***Learning Outcomes***	***Suggested Learning Activities*** Unless otherwise noted, activities for all tasks will include: • Seek and read legislation, codes, guidelines, policies, manuals and literature (eg. NATA, NPAAC, NCEAP Code) • Participate in daily departmental activities, including all aspects of forensic practice.	***Potential Assessment Methods*** For all tasks the components of the Part I and Part II RCPA exams, the Casebook, the Autopsy and the Learning Diary are important assessment tools.
Discipline—Specific Functions of the Forensic Pathologist as Medical Specialist			
Case selection/ acceptance and management	Case selection/acceptance • Advise clinicians and Coroner on appropriate selection/acceptance of cases. Case Accession • Evaluate and monitor a reliable method for case/body identification, mortuary accession and body discharge. Case management • Manage bodies/cases through the entire process including associated procedures. • Liaise with Coroner about level of death investigation and associated procedures.	Refer to Coroners Act or equivalent. For all outcomes below, refer to e.g., Australian Mortuary Managers' Association Guidelines; NPAAC Guidelines or equivalent.	Work based assessment

	• Implement all OH&S requirements relevant to Trainee's involvement in death investigation practices and his/her obligations to others. Specimen Storage and Retrieval • Ensure that specimens are stored according to an appropriate system • Access this system to retrieve specific specimens for examination and review • Ensure that specimens are sealed and marked to preserve the integrity of evidence so that the Legal requirements for "chain of custody" are fulfilled Record Keeping and Disease Indexing • Index specimens appropriately • Retrieve records relating to specific cases or specimens • Retrieve specimens showing examples of specific diseases or processes		
Death investigation	• Participate in and evaluate death scene examination to provide advice to police & coroner, etc. • Review & evaluate medical records and other material relevant to the death investigation. • Collaborate with medical and scientific colleagues and other death investigators.	Attend as many death scenes under supervision as practicable. Arrange attendance at police crime scene investigation unit and/or death scene simulations.	Work based assessment

	Autopsy • Perform sufficient macroscopic adult and paediatric autopsies to attain: o high level of expertise in general procedures, including - external and internal examinations - evisceration, dissection and reconstruction procedures - detection and objective description of macroscopic abnormalities o competence in special procedures, including: - photography - estimation of time since death, - evaluation of taphonomic processes - appropriate use and evaluation of forensic radiology - detection and evaluation of neuropathology - spine, vertebral artery and neck dissection - detection and evaluation of cardiac pathology - detection and evaluation of obstetric pathology - sexual assault examinations - handling and evaluating osteological /anthropological specimens - subcutaneous dissection. o competence in performance of **all** types of forensic autopsy, including homicide and special types such as: - aviation deaths - diving deaths - deaths in custody - paediatric deaths - maternal deaths - high profile autopsies	Comply with current RCPA requirement for special paediatric, neuropathology and cardiac pathology experience.	

	- adverse medical events - sudden unexpected death in infancy - high risk infectious cases - workplace death - decomposed or skeletal remains, etc. o competence in identification techniques and multi-fatality incidents such as: - terrorism and chemical, biological or radiological incidents - principles and aspects of the practice of odontology - disaster victim identification (DVI) procedures, DNA and X-rays Microscopy/Histology • Undertake sufficient forensic histopathology to demonstrate a high level of expertise in areas such as: o sample selection o tissue fixation o embedding and sectioning o staining • Undertake sufficient forensic histopathology (i.e. histopathology relevant to forensic practice) to demonstrate competence in areas such as: o histochemistry o frozen sections o relevant cytology and fine needle aspiration • Demonstrate a high level of expertise in the interpretation of forensic autopsy histopathology, including: o injuries: evaluation, healing and complications o approaches to ageing injuries (skin, skeletal, visceral)	Refer to Australasian DVI Standards Manual and local counter-disaster plan manuals. **http://www.interpol.int/Public/DisasterVictim/forms/default** Review and learning via multi-header microscope with consultants and other Trainees.	

	o cardiac histopathology of forensic significance o neurohistopathology of forensic significance o pneumonias o identification of micro-organisms of forensic significance o histopathology of IV and other drug use o histopathological approaches to decomposition. Other sampling • Take and preserve appropriate samples from suitable sites for toxicology and other investigations, with cognisance of contamination and post-mortem processes, such as redistribution. • Apply medical science to death investigation, including: o osteology and anthropology o microbiology o biochemistry o genetics, molecular biology o haematology, etc. • Apply forensic science to death investigation, including: o general aspects (principles, procedures, continuity, etc.) o photography o at scene (photography, blood spatter, trace evidence, archaeology, exhumation procedures, etc.) o at autopsy (DNA, toxicology, ballistics, physical evidence, entomology, etc.)	Organised interaction with toxicology laboratory. Organised interaction with relevant laboratories. Organised interaction with local forensic science facilities/courses.	
Communication specific to the	Reporting • Objectively record macroscopic and microscopic findings,	Consider Expert Evidence Course (National Institute of	

Forensic Pathologist	including relevant photography, so that another person at another time can independently evaluate the autopsy/death investigation and come to their own conclusions. • Collate reports of other ancillary investigations. • Identify and evaluate relevant publications and similar cases from the archives of the institution or databases, implementing the principles of evidence-based practice. • Describe, summarise and interpret these reports, with positive and negative findings, in the light of the circumstantial and clinical history, and with special attention to histological and toxicological interpretation. • Discuss these findings and/or reports with the supervising pathologist o at the time of autopsy o at the review of histology and/or o at the finalising of the report. • Record a professional opinion about the cause of death, factors contributing to the death and relevant aspects of the circumstances of the death. • Communicate relevant findings, reports and opinions in a timely fashion to, inter alia, coroners, police, families, colleagues, conferences, journals, courts and lawyers. • Observe and evaluate discussions and expert evidence provided by colleagues, demonstrating an understanding of the rules of evidence and the role of the expert. • Provide expert evidence as required; have performance reviewed and evaluated.	Forensic Science) or equivalent. Access National Coroners Information System Review colleagues' reports; interaction with toxicology facility. Attend pre-trial conferences and courts. Colleague/supervisor attend to hear and evaluate evidence provision.	

	• Communicate orally and in writing at the level of the target audience. • With regard to the health implications of the death investigation, communicate as appropriate with families, counsellors, clinicians and/or other relevant persons • Participate in the provision of second opinions by senior colleagues, demonstrating an understanding of the related special obligations and ethics.	Consider attending relevant courses. Organised interaction with counselling services, families. Prepare draft second opinion(s).	
Professional obligations specific to the Forensic Pathologist	• Refer and adhere to the law, relevant ethical codes and guidelines relating to death investigation, provision of reports, opinions and evidence, tissue and organ removal and retention, confidentiality, etc. • Promote the value of the death investigation/autopsy and further its application in relation to: o public health and safety, including disease monitoring and prevention o quality health care provision and quality control o ethical provision of human tissue for transplantation o teaching and research, etc. • Promote the application of forensic pathology and related disciplines to circumstances of humanitarian need and abuses of human rights. • Contribute to interagency planning and management of multi-fatality disasters.	Refer to RCPA Position Statement on Autopsies; National Code of Ethical Autopsy Practice; Human Tissue Act or equivalent. Cases presentations at hospital rounds. Organised interaction with tissue bank/organ donation facilities. “The Missing”: ICRC website. Minnesota Protocol	

TRAINING REQUIREMENTS

To gain Fellowship as a specialist Forensic Pathologist requires 5 years of accredited training in the discipline, which includes a full-range of autopsy practise, histopathology and exposure to the forensic sciences.

The training program must include the equivalent of at least 2.5 years of training in accredited departments of Anatomical Pathology. Trainees and supervisors are to ensure that experience is gained in non-Coronial autopsies, a wide range of biopsy examinations and reporting, and laboratory management: this experience should include a total of at least 3 months each of neuropathology, neonatal/paediatric pathology and gynaecologic/obstetric pathology. There should be exposure to specialised techniques of histopathology, including electron microscopy and immunohistochemistry.

The remainder of the training program is spent in accredited departments of Forensic Pathology. Specific experiences during this time include a minimum of 150-200 autopsies per year, 10 homicide autopsies, 15 death scenes attended and 30hrs of toxicology training. Trainees and supervisors should ensure that an understanding of contemporary practise in forensic sciences is gained, particularly how these relate to death investigation.

ASSESSMENT

The examination process includes:

- Basic Pathological Sciences (BPS), any time prior to FPII
- Anatomical Pathology Part I (API), which may not be taken until the third year of training
- Forensic Pathology Part II (FPII), which may not be taken before the fifth year of training.

These durations refer to full-time training (or part-time equivalent) in accredited laboratories.

Each of the examinations should be considered as equal hurdles leading to Fellowship in the discipline of Forensic Pathology. Briefly:

The BPS examination tests knowledge of the science that underpins disease processes (see relevant section in this handbook).

The Part I examination is the Anatomical Pathology Part I examination (API). This examination tests knowledge of morbid anatomy (autopsy pathology), surgical and medical pathology, and introductory Forensic Pathology. The examination is broad based and could be expected to include a test of understanding of disease processes, the ability to recognise and describe gross and microscopic lesions, competence in clinico-pathological correlation, and knowledge of laboratory techniques, including occupational health and safety related issues.

Trainees at FPII must show continued development and enhancement of their professional skills and expertise in Forensic Pathology. The examination testing the Trainees ability to formulate and present diagnostic opinions on the full-range of issues and cases encountered by a specialist forensic pathologist in daily practise.

Anatomical Pathology Part I Examination (API)

The examination comprises (*see AP chapter)*:

Phase 1

- A 3 hour essay-type written paper

- A 4-hour practical examination of 20 cases that will consist entirely of histopathology slides (biopsy, surgical and autopsy pathology). *Full details are available on the RCPA website.*

Candidates who are successful at Phase 1 will then be invited to proceed to Phase 2.

Phase 2

- A 3 hour (plus changeover time) practical examination in which candidates progress through a series of stations. This may comprise the following in any combination:
  - Frozen sections
  - Cytology cases (e.g. exfoliative and/or effusion fluid cytology and fine-needle cytopathology)
  - Histopathology (biopsy, surgical and autopsy pathology)
  - Special stains
  - Immunoperoxidase slides
  - Photographs of immunofluorescence examination
  - Electron micrographs
  - Macro photographs, which may include forensic-based material.

  Some cases might consist of multiple components (e.g. biopsy slides + immunofluorescence photographs + electron micrographs).

- Two 20-minute oral examinations.

Autopsy Assessment

All candidates taking the API examination will be required to complete the Autopsy Assessment, in order to demonstrate competency in autopsy technique and pathology.

The Autopsy Assessment:

- is a component of the API examination
- may be completed at any time after 15 months of training
- must be completed **in addition to** performance of a Coronial autopsy required as part of the FPII examination

Procedure

The full procedure and form for the assessment is available on the RCPA website (from the Members site go to Publications and Forms/Document Library/Training and Exams—Exam information).

- The procedure will include:
  - an introductory session with the assessors and candidate during which the candidate could be expected to demonstrate adequate knowledge of relevant OH&S matters, knowledge of correct completion of paperwork (consent, etc.) and relevant knowledge of any legislative requirements pertinent to the autopsy process or specific case being examined
  - the actual performance of an autopsy including demonstration of any required specialised dissection of the main organ system involved in causation of death
  - the interpretation of the macroscopic findings
  - the selection of appropriate specimens for ancillary investigations
  - the selection of appropriate blocks for histology
  - the examination and interpretation of histological sections
  - the submission of a written report including macroscopic findings, histological interpretations and clinicopathological correlation.

It is strongly advised that the decision as to when to present for the autopsy assessment be made by the candidate in consultation with his/her supervisor. Candidates should ensure they have sufficient experience in autopsy performance before they present for the assessment. No specific number of autopsies is required to be performed prior to presenting for the assessment as the requisite number for competency to perform autopsies may vary from candidate to candidate. However, it is suggested that the candidate have personally performed a minimum of 10 autopsies before presenting for the assessment.

Outcomes For Unsuccessful Candidates In API

As a **guide**, for the written paper, a fail grade is considered to be <46%, a borderline result as 46 to 50%, a clear pass as $\geq$ 51% and a meritorious pass as $\geq$ 60%.

It should also be noted that:

- no candidate having obtained a fail grade in any component of the examination will ordinarily be granted an exemption from that component
- ordinarily a candidate re-sitting the second special practical will be required to also attend the oral examinations

- a candidate cannot proceed to the FPII examination until all components of the API examination have been completed successfully
- The APl and FPll examinations must ordinarily be sat in separate years, with the exception of candidates in their 5th year of training who, having previously been unsuccessful at the APl examination, pass the APl in their 5th year—these candidates may then attempt the FPll as an "exit" examination in the November round of examinations.
- a candidate with any exemptions must pass all components of the API examination within five years of the first attempt; otherwise he/she will ordinarily be required to re-sit the full examination.

Forensic Pathology Part II Examination (FPII)

The examination comprises:

Phase 1

- A Casebook of 8 cases (or alternative, see below)
- An autopsy assessment (see below)
- A 3 hour essay-type written paper (see below)
- A 4 hour practical of 3 cases (see below)

Candidates who are successful at Phase 1 will then be invited to proceed to Phase 2.

Phase 2

- A 2 hour practical examination of forensic pathology, comprising macro-photographs and histopathology (see below)
- Two 20 minute oral examinations

Casebook Requirements

The Casebook comprises 8 cases. The aims are to produce for each case:

- a succinct presentation of no more than 10 pages (single spaced type) with the discussion, clinicopathological correlation, at least twice as long as the remainder of the presentation
- a bibliography of approximately 15 to 30 references and including recent peer-reviewed literature
- a comprehensive and critical but selective appraisal of the cited literature
- high quality photomicrographs/illustrations
- expensive binding and production are not necessary and will not affect outcomes

The 8 cases presented in the Casebook should cover:

- the history surrounding the death
- the macroscopic and microscopic findings at autopsy
- the results of associated findings, such as toxicology, radiology, etc.
- a discussion of the findings, and the mechanisms and cause of death

Repetition is to be avoided. The 8 cases should be chosen from the following categories (only one case per category):

- sudden unexpected natural death due to natural cause
- obstetric death
- drug toxicity or asphyxiation
- accidental or sudden unexpected death in an infant
- homicidal firearm or stabbing death
- homicidal battering or homicidal asphyxial death
- motor vehicular collision or pedestrian death
- death from environmental exposure, starvation or immersion
- death associated with fire or immersion
- electrocution or lightning death
- death during medical procedure or associated with medical therapy
- death from injury, where injury interpretation assisted the investigation
- death in custody
- death in obscure circumstances
- unexplained death requiring comprehensive examination
- examination of skeletalised remains

Preparation of the Casebook

- cases must have been handled personally by the Trainee as part of their supervised training
- at least 2 cases must have been handled in the 12 months immediately preceding the submission date

- the cases must not be used in any other Casebook at any time, or by any other Trainee

To this end, the Trainee will be expected to make the following signed and dated declaration at the beginning of the Casebook:

> I certify that the cases which comprise this Casebook were examined and reported by me as part of my personal supervised practice during my accredited training in Forensic Pathology. None has been used by any other Trainee for any other Casebook. Cases …. and …. were reported by me during the last 12 months. The case reports are original and have not been reported in any other Casebook.

The Supervisor needs to make the following signed and dated declaration at the beginning of the Casebook:

> As the supervisor for Dr. ……, I certify that I have audited the cases that form this Casebook. Each case was examined and reported personally by Dr. …….. during his/her training in Anatomical Pathology, and Cases …. and …. were reported by him/her during the last 12 months. The case reports are original and have not been reported in any other Casebook.

Alternatives to the Casebook

Trainees are encouraged to share their learning experiences, to the advantage of all Forensic Pathologists. Accordingly each paper published in a peer-reviewed journal or each oral or poster presentation at national/international meetings involving forensic pathologists (e.g.: RCPA Pathology Update; IAP; ANZ Forensic Science Society; Australasian Coroners Conference) can be substituted for 3 of the 8 cases in the Casebook. The Trainee is required to be the principal author, the oral/poster presenter, and had significant input into the publication/presentation. If the presentation is a Case Report then the case must have been reported by the Trainee in his or her practise during the period of training. A copy of the journal article or presentation is to be included as part of the Casebook.

Candidates undertaking and completing a PhD thesis directly related to forensic pathology during the training period may be exempt from up to 5 of the 8 cases in the Casebook, providing the remaining 3 cases or publications are on subject matter other than the topic of the thesis. The number of cases exempted will depend on the breadth of the topic covered and will be at the discretion of the Chief Examiner.

Submission of the Casebook

- Casebooks must be received at the College by 31 March each year, so that they can be assessed in advance of the practical and oral examinations.
- two hard copies plus an electronic copy on CD must be submitted. Hard copies may be spiral bound.
- Casebook results are ordinarily released when Trainees are notified of their progress to the oral examination.
- revised Casebooks must be received at the College by 31 October each year, so that the results are available for ratification at the November Board of Censors meeting.
- if revised Casebooks are not received by the due date, results may be held over until the next year, in which case two new cases may be required to ensure at least two cases were reported during the 12 months before the submission date.
- in exceptional circumstances, the Board of Censors may allow a candidate to sit a three-hour essay-type written paper in place of the Casebook.

Assessment of the Casebook

- Casebooks will be assessed as satisfactory or unsatisfactory.
- Trainees who satisfactorily complete the Casebook, but are unsuccessful in the practical or oral components of the examination, will receive a Casebook exemption when they re-sit FPII.
- Trainees whose Casebooks are assessed as unsatisfactory, will be exempt the successfully completed components of the examination and allowed to revise and re-submit the Casebook. The FPII examination will not be complete until a satisfactory standard is attained in the Casebook.
- Trainees who produce particularly good reports may be approached with regard to the inclusion of selected cases in a case-based teaching collection e.g., College website, or for publication in the RCPA journal Pathology.

Autopsy Assessment

All candidates taking the FPII examination will be required to complete the Autopsy Assessment, in order to demonstrate competency in Coronial autopsy technique and pathology.

The Autopsy Assessment:

- is a component of the FPII examination
- may be completed at any time after completion of the API examination

The procedure is the same as the Autopsy Assessment undertaken as part of the API examination.

Written Paper

The paper is the same format as that in the API examination but with emphasis on Forensic Pathology rather than Anatomical Pathology.

Practical Examination: Long Cases

The candidate will be asked to consider findings (history, examination and investigations) from 3 cases, and prepare a report to the Coroner, Court or authorised investigator.

Practical Examination: Short Cases

The candidate will be required to examine illustrated colour photographs of forensic cases and histopathology slides of forensic and medical post mortem significance. This may include a series of photographs and a series of cases.

Oral Examinations

Two 20-minute examinations will assess the Trainees knowledge in Forensic Pathology and capacity to logically discuss with peers issues of forensic significance. The focus will be assessment of the Trainee's integrative skills and ability to formulate and express an opinion. As part of this examination Trainees may be presented with findings in one or more selected Coronial post mortem examinations: the findings may include fixed organs and tissues; histological slides; photographs—macroscopic or microscopic; radiological findings; test results; and statements concerning the circumstances of death.

Aids in the Acquisition of Knowledge
See Anatomical Pathology section

Key Texts in Forensic Pathology

Byard, R.W. 2004. Sudden Death in Infancy, Childhood and Adolescence (2nd ed.). Cambridge.

Byers, S.N. 2002. Introduction to Forensic Anthropology. Boston: Allyn and Bacon.

Cox, M. and Mays, S. 2000. (eds.) Human Osteology in Archaeology and Forensic Science. London: Greenwich Medical Media.

Di Maio, V.J.M. 1999. Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques (2nd ed.). CRC Press Inc.

Di Maio, V.J.M. and Di Maio, D. 2001. Forensic Pathology (2nd ed.). CRC Press Inc.

Dodd, M. 2006. Terminal Ballistics: a Text and Atlas of Gunshot Wounds. CRC Taylor and Francis.

Dolinak, D. and Matshes, E.W. 2002. Medicolegal Neuropathology: A Color Atlas. CRC Press.

Drummer, O.H. and Odell, M. 2001. The Forensic Pharmacology of Drugs of Abuse. Arnold Publishing.

Henssge, C., Knight, B., Krompecher, T., Madea, B. and Nokes, L. (eds.). 1995. The Estimation of the Time Since Death in the Early Postmortem Period. Arnold Publishing.

Karch, S.B. 2001. Karch's Pathology of Drug Abuse (3rd ed.). CRC Press.

Krogman, W.M. and Iscan, M.Y. 1986. The Human Skeleton in Forensic Medicine (2nd ed.). Springfield, Ill: Charles C. Thomas.

Mason, J.K. and Purdue, B.N. (eds.). 2000. The Pathology of Trauma (3rd ed.). Arnold Publishing.

Payne-James, J., Busuttil, A. and Smock, W. (eds.). 2003. Forensic Medicine: Clinical and Pathological Aspects. London: Greenwich Medical Media Ltd.

Payne-James, J., Byard, R., Corey, T. and Henderson, C. (eds.). 2005. Encyclopaedia of Forensic and Legal Medicine. 4 Vols. London: Elsevier.

Ranson D. 1996. Forensic Medicine and the Law: An introduction. Melbourne: Melbourne University Press.

Saukko, P. and Knight, B. 2004. Knight's Forensic Pathology
(3rd ed.). Arnold Publishing.

Vanezis P. 1989. Pathology of Neck Injury. Butterworths.

British Medical Association. 2001. The Medical Profession and Human Rights: Handbook for a changing agenda. Zed Books in association with the BMA.

Code of Practice and Performance Standards for Forensic Pathologists. Home Office Policy Advisory Board for Forensic Pathology and The Royal College of Pathologists. November 2004.

Guidelines for the Facilities and Operation of Hospital and Forensic Mortuaries. NPAAC. Commonwealth of Australia 2004.

Guidelines on Autopsy Practice. Report of a working group of The Royal College of Pathologists. The Royal College of Pathologists. September 2002.

Sudden Unexpected Death in Infancy. A multi agency protocol for care and investigation. The report of a working party convened by The Royal College of Pathologists and The Royal College of Paediatrics and Child Health. Chair: The Baroness Helena Kennedy QC. September 2004.

Journals

American Journal of Forensic Medicine & Pathology

Journal of Forensic Sciences

Forensic Science International

Meetings and Conferences:

RCPA Pathology Update

Short course in Forensic Pathology (Hobart)

ANZ Forensic Science Society

Australasian Coroners Conference

Other Learning Resources

http://www.rcpath.org/index.asp?PageID=455

http://www.rcpath.org/index.asp?PageID=38

APPENDIX 4

Notes on the Increasing Complexity of Medico-Legal Death Investigations

It is the common experience of forensic pathologists everywhere that the medico-legal investigation of death is much more complicated than in the past. This appendix is an attempt to describe the increasing complexity that has occurred in the last 10–15 years.

Context

There is a background context that is well accepted:

- The rise of the consumer movement over the past 25 years and the increased understanding by consumers of their rights;
- The increased specialization and subspecialization of medical practice, leading to a more fragmented approach to individual health care;
- The increasing role played by technology in medicine and increased expectations to make use of new technology which is additional to—not necessarily replacing—existing technology or practices;
- Health inflation of 7–8%, vs. 3% inflation for the rest of the economy, is partly driven by the above points;
- Relative decline of the public health-care sector compared with the private sector, especially in the terms and conditions of employment, increases the difficulty and expense of holding practitioners in the former.

This context obviously did not start at any particular point, but has progressively added to the complexity of undertaking medico-legal death investigations (MLDI) over the past 10–15 years. This appendix is *not* an evaluation of the whole MLDI process. It is an evaluation of the increased complexity of that process.

For the purposes of considering complexity, the MLDI process can be thought of in the following ways:

- Administrative
- Legal
- Intellectual/Technical

Take for example the obtaining, reading, and evaluation of the medical history. This involves the administrative exercise of obtaining the record, or more correctly, records from multiple sources. It also involves the intellectual and time-consuming exercise of evaluating the record, and later integrating this evaluation with the findings from the post-mortem examination. As medicine has become more complex, so this evaluation and integration exercise has become more complex and time-consuming. Obtaining the records also involves understanding the much more complicated legal environment of privacy surrounding medical records generally. The complexities apply not only to pathologists, but to many other parts of the MLDI system.

Table 4.1 summarises the functions and activities of forensic pathologists and aspects of their increasing complexity.

Table 4.1 Functions and Activities of Forensic Pathologists together with the increasing complexity of the work.

Administrative function	Activity
Accreditation requirements; quality management system	• NATA/RCPA medical and forensic testing accreditation requirements; • Requirements of continuous improvement. • document control (the VIFM document control system contains 1,147 documents including forms); • policies and procedures; standard operating procedures; • system of internal audit: administrative case review; technical case review; • weekly pathology case review meeting; • weekly Institute meeting; • pathologists accompanied to court twice a year by another pathologist; • continuing medical education entitlements in contract of employment; • Continuous Improvement Request Corrective Action (CIRCA) system as part of approach to continuous improvement;
Professional development/requirements	• Q.A. programs: RCPA histopathology; College of American Pathologists (CAP) Forensic pathology; CAP pediatric; CAP neuropathology; RCPA Continuing Professional Development Program
Medical Records (N.B. Half of all MLDIs involve patients with relevant medical records that need to be evaluated)	• More records to be sought (patients have records in multiple locations); • Difficult to track all records because of increasingly fragmented health-care system; • Patient dying in hospital may have relevant records in one or more of the emergency department, the ward, intensive care unit, operating theatre, medical records department, pathology department, radiology department, etc; • doctor(s) may have relevant information that is not in the record; • records may be with other practitioners out of the hospital.
Non autopsy examinations (inspections, Section 29 examinations to enable consideration of objection to autopsy):	• Requirement to evaluate all records quickly; • Requirement to produce reports quickly for coroner's decision re autopsy.
Increased number and length of lines of communication,	• Neuropathology, genetics, biochemistry, odontology, imaging (CT scan, photography—VIFM, VicPol Forensic Services Dept);

especially where these are not in-house	• Police, hospitals, doctors, families; • Donor Tissue Bank of Victoria, • National Coroners Information System, Workplace Death Investigation Unit, Clinical Liaison Service.
Climate of increase in consumer rights	Now, marked increase in family consultation concerning: • autopsy preferences • tissue retention issues • results of autopsy
Legal Function	**Activity**
Coronial decisions	• BNI's (body not in—Registrar of Births,Deaths and Marriages concludes on the basis of the Death Certificate that death should have been reported to Coroner, but it was not. Registrar reports death); • Mesothelioma deaths (Coroner determined that all deaths from mesothelioma, previously not reported, should be reported).
Reviewable deaths	• New statutory function requiring all second and subsequent child deaths in a family (widely defined) referred by the coroner to VIFM to be reviewed to assess health and safety of surviving siblings and parents.
Legal environment: increased litigiousness	• Increased scrutiny in court of pathology reports and opinions • Uncertainty re immunity for witnesses from MPBV for things done in good faith (increased numbers of pathologists reported to GMC/Medical Board: U.K., Victoria, South Australia, NSW).
Liability	• Results discovered of health significance to family; almost certainly liable in negligence if the results not conveyed properly to the family so they can do something about it.
Intellectual & Technical Function	**Activity**
Complexity of Occupational Health and Safety surrounding infectious disease (overlaps with increased legal complexity and liability above)	• HepC, HepB, HIV, Tuberculosis, Meningococcus risk • CJD; heightened awareness; precautions—cumbersome, time-consuming,
Tissue Banking: Autopsy coordination	• consultation with pathologist; Extra autopsy requirements (e.g., opening whole small and large

	intestine, increased histology requirements, routine toxicology).
Increase in complexity of medicine generally	• Challenges pathologists' knowledge base; • Requirement for more research in particular cases and involvement of other specialists; • Specialization/subspecialization, i.e., widens and deepens the knowledge required; • Number and types of new drugs; rapid expansion of their availability • Increasing age and pathologies present at death • Paediatric pathology demands • Neuropathology demands
Increase in technology (additional to existing; i.e., increased effectiveness, decreased efficiency)	• CT Scan; • Immunostaining for brains; for tumours; • DNA testing, e.g., Brugada Syndrome, Long QT syndrome (10–15 % of SIDS have this. Approx. 50 cases of SIDS per year. Requirement to test all SIDS for this both for diagnostic purposes and family health related purposes. Cost ++ ($2,000 approx per case). • Biochemical/enzyme deficiency testing—SIDS; • Pacemaker testing; prosthetic valve testing; implanted defibrillator device testing.
Increase in scene information needed	Required urgently generally, but especially: • SIDS • Sudden Unexpected Death in Infancy • Epilepsy
DVI procedures	• Training requirements; • All DVI incidents are full on exercises.

The complexity of MLDIs has increased substantially over the last 10-15 years. The expectations, administrative and legal imperatives, and the intellectual and technological developments in medicine and pathology all interact to result in a medico-legal death investigation that is quite different to the investigation of 2000, let alone 1990.

APPENDIX 5

Forensic Pathology: VIFM Technical Quality Review of Forensic Cases

Background

As a matter of good operational practice in forensic pathology, it has been decided to implement a Technical Review of the Institute's forensic cases. These cases are those that concern or overlap with the criminal justice system. The aim of the review is to assure quality for the main users of our reports in these cases.

Forensic Cases

The cases, which will be subject to Technical Review, are:

- Homicides
- Suspicious deaths (including but not limited to all cases involving the Homicide Squad; all firearm deaths; all fire deaths where it is not certain the deceased was alive during the fire)
- Deaths in custody
- Pediatric deaths (death in children 4 years and younger)
- All unascertained deaths in deceased under 40 years of age
- Other cases, at pathologists' discretion, where colleagues would believe a technical review is desirable

The Aim of the Review

The review aims to add a level of assurance that the critical observations in the case are reliable and the interpretation of those observations and conclusions based on them are reasonable. This is not the same as saying that the reviewer *agrees* with the reports and its conclusions in detail.

It does mean that the reviewer believes the critical observations are reliable (i.e., that they can be confirmed in some way—e.g., by photographs, histology, or other means—and the reviewer agrees with the observation). This is another way of saying that the case is independently reviewable and the reviewer agrees that the observation has been correctly made. It also means that interpretations of the observations, and conclusions based on them, are reasonable in quantity and quality.

It is axiomatic that the quantity and quality of the conclusions rely not only on the observations but also the level of information about the circumstances and particular issues in the case. The provision of information about the case and its particular issues is outside the VIFM's control and is often incomplete. Therefore, where the provision of such information is incomplete or faulty, the quantity and quality of the conclusions provided in the report by the forensic pathologist is correspondingly reduced.

The Process of the Review

The process is less cumbersome than analogous processes in the U.K. or Canada. This is because ours is an internal review process. Other processes are often designed to evaluate reports that have been produced in a variety of outside institutions or settings. Within the Institute we have many procedures that we know are standard and therefore do not need to be part of this technical review since they are subject to other forms of audit (for example, as we know that histology is undertaken in every case, the existence of histological evaluation does not need to form part of the Review).

When it is known that the case is one that will be subject to review, a reviewing pathologist should be allocated. This will mean that in some cases the reviewing pathologist will be able to see the deceased. There may well be discussion at this point between the two pathologists.

In due course, a reviewing pathologist completes the Technical Review Form. It may be that the reviewer cannot complete the form without discussion with the pathologist. This is an important way of achieving the assurance of quality that underlies the whole process—discussion of the issues between two pathologists.

Signing (or electronically authorizing) the Technical Review Form completes the review. The form sits in the Institute's quality system. The report itself cannot be issued until the review is complete. The report should include the following statement: "This case has been subject to the Institute's Technical Review process."

If for some reason the report needs to be issued before completion of the Technical Review, the statement should obviously be left out. The report should, however, still be subject to formal Technical Review. If quality issues of a general nature arise (e.g., procedural or pathology content issues), these should be raised at a meeting of pathologists.

FORENSIC PATHOLOGY

TECHNICAL QUALITY REVIEW OF FORENSIC CASES

Case Name:……

Case Number:……

Reporting Pathologist responsible for case:…….....

The material subject to review and forming the basis of my conclusion below was:

1. **Viewing of the deceased around the time of the autopsy Yes/No**
2. **Draft autopsy report Yes/No**
3. **VicPol Autopsy Photographs Yes/No**
4. **CT scan Yes/No**
5. **Other reports and/or material Yes/No**

Specify:……..

……

……

In my opinion, the critical observations/findings in this case are independently reviewable and the conclusions based upon them are reasonable. (This does not mean that the reviewer necessarily endorses the conclusions.)

Comments (optional):…….....

…….

……..

……..

……

I have discussed my Review with the reporting pathologist.

Name of Reviewer:…… Date:…….

Signature of Reviewer……

APPENDIX 6

VIFM Workload Statistics (MLDI's including scientific services)

The medical procedures used to establish the circumstances and medical cause of death depends on the type of case and the order made by the Coroner. These need to be understood to appreciate the statistics which follow. They are:

Body not in (BNI)—an investigation of the death without an examination by the forensic pathologist of the body. The investigation process involves an examination of a substantial quantity of documentation from numerous sources, which may include all or some of hospital records, police records, other medical records, coroner's reports and other material.

Death certificate inspection—an assessment of the death including a review of medical and police documentation, CT scanning and examination of the body, resulting in the forensic pathologist determining that the treating physician is the appropriate person to issue the death certificate.

Full autopsy—an examination of a person's body after death, involving review of medical and police documentation, CT scanning, external examination and both the macroscopic ("naked eye") observation of organs and the microscopic examination of tissues. It may involve laboratory testing of tissues and fluids, including toxicological and other analysis. Some pathological examinations may require the involvement of sub-specialists such as neuropathologists, cardiac pathologists, immuno-pathologists or paediatric pathologists.

Inspection and Report ("inspections")—an examination of a person's body after death involving a review of medical and police documentation, CT scanning and external examination, where in the opinion of the forensic pathologist it is thought that to meet coronial obligations, an internal examination or internal autopsy is not necessary.

Section 29—A forensic pathologist's consideration of objections to a full autopsy to assist the coroner in determining whether a full autopsy is to be conducted. Forensic pathology examinations pursuant to Section 29 objections involve a review of medical and police documentation, CT scanning and external examination. This is a special case of the previous type (Inspection).

All the above involve investigation and preparation of reports.

Table 6.1 Numbers of medico-legal death investigations—with predictions to 2001/12

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Full autopsy	2422	2353	2370	1990	2169	2224	2505	2621	2736	2852	2968
BNI	0	60	145	373	398	444	672	703	734	765	796
Inspections	140	321	380	475	495	452	405	423	442	461	479
Section 29 objection	183	220	324	520	590	729	831	869	907	946	984
Death Certificate	228	217	243	238	211	228	230	241	251	262	273
Total	**2973**	**3171**	**3462**	**3596**	**3863**	**4077**	**4642**	**4856**	**5071**	**5286**	**5500**
%increase over previous year		6.7%	9.2%	3.9%	7.4%	5.5%	13.9%	4.6%	4.4%	4.2%	4.0%
EFT pathologists	5.2	5.4	5.3	5.4	6.6	6.8[§]	6.3[§]	9.3*	11.3*	12.3*	12.3*
Number MLDI per EFT	572	587	653	666	585	600	737	522	449	430	448
Full autopsies per EFT	466	436	447	369	329	327	398	282	242	232	241
Equivalent autopsy caseload**	2642	2680	2806	2632	2847	2937	3360	3515	3654	3825	3976
Equivalent autopsies per EFT pathologist**	508	496	529	489	431	436	530	378	323	311	323
Average cases per working day managed (ie cases divided by 250)[#]	12	13	14	14	15	16	19	19	20	21	22

Note 1: 2007/08 uses data up to November 15th and pro rata calculates a full year of work

Note 2: 2008-2012 uses the trendline of previous 7 years to predict the next 4 years using conservative estimates

[§] In 2007 Institute had a pathologist free of charge from NZ for training; and lost the services of its paediatric pathologist due to retirement.

* Assumes employment of 3 pathologists in 2008/09, 2 pathologists in 09/10 and 1 pathologist in 10/11. EFTs will of course change if the number of pathologists changes. For example, if the total increase is 3 pathologists by 2011/12 number of equivalent autopsies per EFT pathologist would be 420, based on current growth in case numbers.

** Equivalent autopsy caseload—Full autopsies and 40% of external examinations and BNI's; allows comparison with autopsies per EFT interstate.

Extracted from the above table are the specific workload numbers per EFT pathologist. They are shown in Table 6.2 below.

Table 6.2 Workloads for Forensic Pathologists

Year	EFT Pathologists	Equivalent autopsies per EFT Pathologist[1]
01/02	5.2	508
02/03	5.4	496
03/04	5.3	529
04/05	5.4	489
05/06	6.6	431
06/07	6.8	436
07/08	6.3	530[1]

These actual caseloads need to be compared with the caseload of 250–300 per annum to be recommended to the Australian Health Ministers Council and the Standing Committee of Attorneys General in a special report commissioned for the purposes of forensic pathology workforce planning in Australia.

The above increases in bodies admitted to the VIFM has consequently led to demand pressure downstream. Details of the increase in case numbers and workload for forensic technical (mortuary) staff, toxicologists and persons involved in identification procedures are detailed below in Table 6.3.

Table 6.3 Workloads of scientific and technical staff

	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Total cases ** (full autopsy)	2973 (2422)	3171 (2353)	3462 (2370)	3596 (1990)	3863 (2169)	4077 (2224)	4642 (2505)
EFT forensic technical staff (FTS)	13	12.8	11.8	11.6	13	13.6	13.8
Workload per FTS staff*	229	248	293	310	297	300	336
Toxicology testing—coronial cases[#]	2346	2454	2605	2470	2703	2845	3390
EFT toxicologists	10	10	10	10	10	10	10
Toxicology—cases per toxicologist[#*]	235	245	260	247	270	284	339
Scientific identifications of bodies[#*]	4%	5%	5.5%	4%	6%	9%	10%
DNA identifications (numbers)[#]	60	81	53	93	107	149	174
Histology workload (slides 000s)[§ #]	45	43	47	37	44	42	58
EFT histology	5	4.5	4	4	4	3.5	4
Histology —slides per histologist [#*]	9000	9555	10444	9250	11000	12000	14500
Microbiology/serology [#]	385/5588	662/5704	548/5798	643/5710	787/6072	1122/6214	1834/7216
EFT micro/serology [#]	1.0	1.0	1.0	1.0	1.0	1.5	1.5
Microbiology/serology workload (cases per EFT) [#*]	385/5588	662/5704	548/5798	643/5710	787/6072	748/4143	1222/4810

** these do not include BNI, but reflect all cases requiring scientific analyses

[#] measures of productivity

* as proportion of admitted cases

^ does not count pathologists on study leave (sabbatical)

[§] routine (H&E) slides plus special stains