

1. Introduction

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What happens when someone dies

When someone dies in the United Kingdom (UK) (excluding Scotland for the purpose of this survey) the death needs to be registered with the state and formal documents issued so that funeral arrangements can take place. In order to register, there must be a recorded cause of death. In the majority of cases, a medical practitioner is able to sign a medical certificate indicating, to the best of his/her knowledge and belief, the cause or causes of death. The medical practitioner is also indicating that, as far as he/she is aware, there are no features in the death that suggest foul play, an accident or a scenario that makes the death appear to be suspicious or unnatural (i.e. not the result of a natural disease)¹.

However, a doctor may not know the cause of death, or there may be factors that suggest an unnatural death. Alternatively, a doctor may complete a medical certificate of the cause of death, which the Registrar of Birth and Deaths regards as not natural or appropriate. In these cases, in England, Wales, Northern Ireland and the offshore islands, the death is referred to a coroner who then decides whether or not to investigate the case further. Following discussion with the reporting doctor and any knowledgeable or interested parties, the coroner forms a view on this. The coroner may decide, in discussion with the reporting doctor, that there is sufficient information to permit a natural cause of death to be recorded and registered. If following discussion between the coroner and the doctor the death is regarded as 'natural', the coroner may issue a certificate (referred to as Pink Form A) that enables the Registrar of Deaths to register the death, without autopsy. If the cause of death is unknown, the coroner may arrange for an autopsy to be performed by a registered medical practitioner (nearly always a pathologist) who will write a report for the coroner that gives a cause of death and if the cause of death is 'natural', the coroner may issue a certificate (referred to as Pink Form B) that allows the death to be registered following the autopsy (but without inquest). A coroner may also decide to hold an inquest into the death at some later date.

How autopsies take place

Autopsies in England, Wales, Northern Ireland (NI) and the offshore islands take place under two main circumstances: the coronial autopsy and the consented autopsy. That requested by a coroner - under circumstances indicated above and described in more detail in 'The Coronial System' - does not require consent from the next of kin. Its purpose is simply to determine a cause of death. In governance terms, it is nothing to do with the National Health Service or hospital practice. Conversely, consented autopsies take place when a clinician requests consent from the next of kin for an examination after death. The clinician will have already signed, or be about to sign, a medical certificate of cause of death. The purpose of the consented autopsy is then to study the conditions that the person suffered from, in order to better understand the medical and pathological chain of events that led to death. These consented autopsies are

usually performed in hospital mortuaries and come under NHS governance regulations.

Currently, about 55% of deaths in England and Wales are certified directly by doctors and 45% are directly referred to a coroner². If the coroner accepts the case for investigation, he/she provides the cause of death for registration purposes, usually confirming the pathologist's cause of death as the basis for this. The net result is that in 2005, 22% (114,600) of the people who died in England and Wales (513,000) were examined after death through a coronial autopsy². On average there are 14,500 deaths in Northern Ireland per annum and in 2005 approximately 1,500 autopsies were performed for the coroner in Northern Ireland³. In terms of the offshore islands, there are approximately 2129 deaths per annum with, on average, 300 coronial autopsies being performed⁴⁻⁶.

Audit of the autopsy

In the UK, the overall quality of the coronial process has never been audited. One of the key components of this process is the coronial autopsy and the resulting report. The autopsy report is a source of information to inform and assist a detailed investigation of individual cases by coroners and their staff, particularly those that are subject to a public inquest within the coronial system, or for cases that go on to become the object of civil claims. A small and unknown proportion of coronial autopsy cases are discussed at mortality meetings within hospitals as part of clinical governance⁷, where the autopsy report often reveals information about the deceased that was unknown or unrecognised to clinical staff prior to death. Beyond anecdotal observation there has been no national overview of the quality of coronial (or other adult) autopsies and the associated reports^{8,9}.

The value of the autopsy

Increasingly, with advances in diagnostic procedures¹⁰ the value of the autopsy has been challenged over the years. Even so, studies from all over the world have revealed the true value of autopsies by highlighting rates of discrepancies between clinical and postmortem diagnoses, and their use as an educational tool for the medical profession⁸.

A recently published meta-analysis examining English language articles published between 1980 and 2004 which studied discrepancies between clinical and postmortem diagnoses showed that there has been little improvement in the overall rate of discrepancies between the 1960s and 2005. The authors concluded that 50% of autopsies produce findings unsuspected before death and at least a third of all death certificates are likely to be incorrect¹¹. This figure has been supported by other investigators examining the accuracy of death certificates¹². The office responsible for registering all deaths is the General Registrar's Office (GRO). In governance terms, it answers to the Office for National Statistics (ONS), which analyses causes of death and publishes data. The ONS comes under the auspices of Her Majesty's Treasury (not the NHS).

Individual studies examining the rates of discrepancies between clinical and autopsy diagnoses vary. In the United States, Goldman et al (1983)¹³ examined 100 randomly selected autopsies from each of the academic years 1960, 1970 and 1980 to determine whether advances in diagnostic procedures have reduced the value of autopsies. They found that in all three decades, about 10% of the autopsies revealed a major diagnosis that if known before death "might have led to a change in therapy and prolonged survival". It was concluded that advances in diagnostic technology had not reduced the value of the autopsy. A similar study examining

missed clinical diagnoses in trauma patients dying in an American intensive care unit (2002)¹⁴ found a missed major diagnosis that may have affected outcome if recognised clinically in 3% of cases in their sample. Another autopsy study examining critically ill patients in a UK teaching hospital found major missed diagnoses in 39% of cases¹⁵. In Australia, a systematic review of reports from 1996-2002 found autopsies detected, on average, 23.5% of clinically missed diagnoses involving the principal or underlying cause of death¹⁶. Finally, a Japanese study found that in 1,044 patients autopsied between 1983 and 1997, 7% of cases had a clinical diagnosis that differed from the autopsy findings¹⁷.

These studies all highlight the value of autopsies in not only providing an accurate cause of death but also their value as an educational tool, serving to advance the understanding of diseases and disease processes. However, it is important to note that the purpose of the coronial autopsy, within the confines of the coronial system, is only to provide a cause of death. One reason why there is necessarily more interest in the coronial system now is because the numbers of consented autopsies have declined dramatically over the last 20 years. In adult practice, coronial autopsies now comprise >95% of all adult autopsies in England & Wales and Northern Ireland. It raises the question, posed throughout this report, of whether the coronial system is the appropriate vehicle to bear all the other potential roles of an autopsy such as education, a deeper understanding of disease processes, and questions from the family.

NCEPOD

NCEPOD has, since 1989, reviewed samples of hospital deaths, 15 of which have included evaluations of autopsy reports. Some of the evaluations have been critical of the standard of coronial autopsy practice^{18,19} and other confidential enquiries have drawn the same conclusions^{20,21}. Of the reports produced by NCEPOD during this time that have included reviews of available autopsy reports; in all cases the majority of the autopsies being performed at the request of a coroner. The reviews have been undertaken by actively practising pathologists and the conclusions and recommendations emerging have mirrored many of the concerns that come out of this current study.

The first NCEPOD report (1989)²², which focussed on perioperative deaths in children, found a high standard of autopsy reports with 114/170 (67%) cases being of 'high' or 'very high' grade and only 6/170 (4%) being 'unacceptable'. The only criticism was that an autopsy was not sought by a clinician or coroner, yet the clinical evidence for the cause of death was inadequate based on premortem information (the clinical records being available).

In the next report, on adult deaths (1990)²³, many of the issues for the next 15 years of NCEPOD reports were established:

- New information about the patients' diseases and prognosis came from the autopsy in 32% of cases.
- The surgical team were informed of the date and time of the autopsy in only 31% of cases, and therefore many did not attend the autopsy.
- Information was fed back to the clinical team in only 78% of cases.
- Clinical history was given in the autopsy report in 76% of cases.
- Tissue samples for histopathology were retained in only 13% of the coronial autopsy cases; this increased to the range 19-55% in the various subsequent reports.

- A clinicopathological correlation was provided to explain the death in 39% of all autopsies.
- The coronial autopsies were graded as 'poor' or 'unacceptable' in 25% of cases.

In reports published between 1992 and 1995, the key issues over coronial autopsies on perioperative deaths were:

- The number of postmortem examinations should be increased.
- They provided valuable audit by confirming surgical findings.
- The overall quality of the autopsies was good, but more clinicopathological correlation and greater precision in statement of the cause of death were desirable.
- The widely used preprinted proformas for coronial autopsies limited the space available for description and interpretation.
- Wider observance of the Royal College of Pathologists Guidelines for Post-mortem reports²⁴ would improve the quality of the examinations.
- The cranial cavity should be examined in all coronial autopsy examinations: in the 1995 report, 7% of the cases reviewed did not have the head opened.
- Critically, 'contacts between the Royal College of Pathologists and the Coroners' Society of England and Wales should be developed to address issues of common interest'.
- Introduction of a system of audit, which includes coroners' autopsies, should be considered.

In 1998, the NCEPOD report²⁵ considered certain surgical procedures and the final key message was that "variation in coronial practice makes it impossible to build a single logical framework for deciding whether a case should be referred to a coroner".

By the time of the report published in 2001²⁶, the decline in the rate of consented ('hospital') autopsies was marked, with 95% of the cases considered coming from coronial authorisation. The quality of the autopsy reports was satisfactory or better in 69%, but the overall quality was not as good as in previous years. Lack of histopathology examination detracted significantly from the quality of the autopsy reports in 28% of cases. Encouragingly, the proportion of cause of death statements that included the operation had risen to 76% of cases.

The most recent of the NCEPOD general reviews of perioperative deaths, including pathology, was published in 2002¹⁸. The key issues that emerged were imperfect communication between clinicians and pathologists, and between pathologists and coroners. Particularly in the transfer, quality and completeness of information concerning events leading up to a death. Regular multidisciplinary audit mortality meetings were endorsed, in part to enable continuing professional development for pathologists as well as enabling clinical review.

Inconsistency in the way individual coroners order autopsies was criticised, particularly considering the demands of the large numbers of deaths being reported to them. There was a call for changing the coronial system and a strong plea that autopsies, like all other branches of medicine, should be subject to the formal scrutiny of external audit by interested groups including clinicians. Finally, the problem for coroners in identifying appropriately specialist

pathologists for certain cases (particularly paediatric) was noted.

The previous NCEPOD autopsy reviews have not been representative of all deaths occurring in the population, since deaths in the community and (until recently) non-perioperative deaths have not been within the NCEPOD remit. This changed in 2004, when the remit of NCEPOD was broadened to encompass all deaths that were not, related to pregnancy, or from homicide related to mental illness. This was reflected in the name change, from National Confidential Enquiry into Perioperative Death, to National Confidential Enquiry into Patient Outcome and Death.

The present study

This study is more truly representative since it is a review of the autopsy reports of all deaths accepted for autopsy by a coroner across the participating states over a particular period, whether occurring in hospitals, nursing homes or elsewhere in the community, the only exception being suspected homicide cases. A further significant change in the review process was the inclusion of coroners as well as pathologists among the Advisors. Since by virtue of the coronial system, the autopsy report is currently intended only for the coroner, it was considered useful to obtain their assessments of the product in conjunction with those of pathologists. Previous NCEPOD reports have included organisational questions that pertained to operations and medical practices, such as provision and staffing of operating theatres. For the present study, a similar investigation was made into some aspects of the provision of facilities and staffing of the mortuaries wherein the autopsies take place.

To understand the context of this report and its findings, the following sections provide a brief overview of the current legislative framework for coroners and the role of pathologists in the coronial process.