Activities of the Special Committee Investigating Deaths Under Anaesthesia – 2007

Report to the Minister

February 2008
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Foreword

This report is part of a continuing series of reports from the Special Committee Investigating Deaths Under Anaesthesia (SCIDUA). It is recognised that the work of the committee is often undertaken out of hours.

The committee particularly recognises the leadership of Dr. Chris Borton (currently on leave due to ill health); Dr. David Pickford (Medical Secretary) and each of the other members. We are especially pleased to see Prof. Ross Holland return to an active leadership role on the committee. It was Dr. Holland’s passion for clinical excellence that led to the formation of SCIDUA (the first committee of its kind) more than 40 years ago.

Whilst the report enables anaesthetists to benchmark their practice against state figures, the key purpose of the report is education and clinical practice improvement.

This report is underpinned by detailed analysis of each individual case, the opinions of a jury of peers, and with detailed confidential feedback to the notifying anaesthetists. I believe that this is the real strength of such a committee.

The report however does reflect the desire of the CEC to inform the Minister and community and provide confirmation that clinicians throughout NSW health system are continually reviewing and evaluating their outcomes and applying the learning.

I commend this report to you.

Clifford F Hughes
Clinical Professor
Chief Executive
Executive Summary

This report to the Minister on anaesthetic mortality is required under the terms of reference of the Special Committee Investigating Deaths Under Anaesthesia (SCIDUA). It is summarises deaths which occurred during or within 24 hours of anaesthesia (and surgery) for 2007.

During the year, 292 deaths were notified, but 327 were reviewed (due to a backlog from the previous year). Feedback was provided to individual anaesthetists through the SCIDUA committee process.

The report is aggregated de-identified data. It is of relevance to anaesthetists, surgeons, health managers, clinicians and quality improvement coordinators in the NSW health system.

Each case reviewed generates a confidential report to the notifying anaesthetists. This feedback is the essential educational purpose of this committee.
1. Introduction

The Special Committee is appointed by the Minister to review deaths occurring either during or within 24 hours of anaesthesia (and surgery). Its sources of information are the State Coroners to whom the occurrence of such deaths must be reported by law, backed up by hospital administrators who furnish the Committee with copies of their notifications to the Coroner.

The Committee was constituted in 1960, and except for an interruption of two years from 1980-82, has been in continuous operation ever since. It is the longest running study of its type in the world, and enjoys an international reputation.

During 2007, the Committee met 10 times. Further details of its activities are described below.

2. Cases Notified

During 2007, 292 deaths were notified to the Committee. This total number includes a majority of patients whose condition was such as to preclude survival despite skilful efforts to save their lives. The majority were emergency operations or urgent in the sense that they could not be postponed.

3. Triage Procedure

Since a significant number of deaths reported are of no significance for either surgery or anaesthesia, the Committee has established a Triage Subcommittee to screen out such obvious cases (Table 2). This subcommittee dealt with 246 cases during 2007, classifying them as “inevitable”, “surgical;” or fortuitous” deaths (see Appendix – System of Classification).

A few deaths are mistakenly notified to the Committee because they were reported to Coroners, but for reasons other than prior anaesthesia. These are also screened out by the Triage Subcommittee.

Where the death is one which warrants further study, the Triage Subcommittee causes a questionnaire to be sent to the anaesthetist with a request for further information. At this stage the system becomes voluntary, but it is pleasing to report that a response rate in excess of 90% is achieved.

<table>
<thead>
<tr>
<th>TABLE 2 – NUMBER OF CASES REVIEWED IN 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classified or excluded by triage subcommittee .................................................. 246</td>
</tr>
<tr>
<td>Questionnaires sent to anaesthetist ................................................................. 43</td>
</tr>
<tr>
<td>Reviewed and classified by full committee .......................................................... 81</td>
</tr>
<tr>
<td>TOTAL NUMBER OF CASES REVIEWED ...................................................................... 327*</td>
</tr>
</tbody>
</table>
The number of cases reviewed and classified exceeds the number of notifications for the year. The reason for this disparity is that a significant backlog which existed prior to 2006 has now been overcome. Future classifications will increasingly be effected with minimal delay.

4. Review by SCIDUA

The full Committee met 10 times during 2007, and reviewed a total of 81 cases. The outcome of this process was that 41 deaths were classified in Categories I, II or III of the system outlined in the Appendix, i.e. those cases in which anaesthesia played some part in the fatal outcome. Of this number, 23 deaths occurred despite the anaesthesia and surgery having been carried out skilfully and appropriately. This category is classified as “III GH”. Hence those deaths which might have been prevented by alternative management numbered only 18. (Table 3)

<table>
<thead>
<tr>
<th>TABLE 3 – ALL DEATHS CLASSIFIED IN Categories I, II &amp; III IN 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category I ........................................................................... 3</td>
</tr>
<tr>
<td>Category II .......................................................................... 8</td>
</tr>
<tr>
<td>Category III ......................................................................... 7</td>
</tr>
<tr>
<td>Categories I, II &amp; III ............................................................ 18</td>
</tr>
<tr>
<td>Category III GH ................................................................. 23</td>
</tr>
</tbody>
</table>

5. Non-Anaesthetic, Non-Surgical Causes of Death

Most deaths within 24 hours of anaesthesia and surgery are the inevitable outcome of disease or injury. Such cases are classified accordingly, either by the Triage Committee or by SCIDUA (Table 4)

<table>
<thead>
<tr>
<th>TABLE 4 – 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category V “Inevitable” ....................................................... 155</td>
</tr>
<tr>
<td>Category VI “Fortuitous” ..................................................... 10</td>
</tr>
</tbody>
</table>

As can be seen from the above table, many deaths are inevitable despite competent anaesthetic and surgical management. A considerable proportion of
these are due to untreatable trauma, despite the patient having been resuscitated sufficiently out of hospital to reach an emergency room still technically alive.

A similar number of non-trauma patients also survive to reach the operating room, but are found at surgery to have a non-survivable medical condition. Unfortunately unsuccessful attempts to save these patients consume huge resources in staff, facilities and consumables – not the least of which are blood or blood products.

The Committee is concerned that in some of these unsuccessful exercises, earlier decisions could have been made to offer palliative care to a doomed patient, rather than embark on a prolonged and expensive procedure with no prospect of success.

6. The Inconclusive Case

There are a few cases where the Committee is unable to reach a conclusion, due to inadequacy of data, or even with quite extensive, but incomplete information. These deaths are then classified as in Table 5

| Category VII (Inadequate Data) | ................................................................. | 3 |
| Category VIII (Adequate Data) | ................................................................. | 5 |
| Total Non-Classifiable | ........................................................................ | 8 |

This number reflects the low percentage of cases in which the anaesthetist has failed to respond to the Committee’s request for adequate information. As can be seen, there is a high degree of co-operation from anaesthetists.

7. What Happens Next

When a death is classified in Category I, II or III, i.e. is attributable in whole or part to the anaesthetic management, the Committee identifies one or more factors which were causative. The anaesthetist who reported the case to the Committee receives a confidential letter advising him or her of the Committee's decision. These letters are composed and signed by the Chairman, who (apart from the medical Secretary) is the only Committee member who is aware of the anaesthetist's identity.

The outcome of the Committee’s deliberations is de-identified (to preserve its confidentiality) and the results passed on to the National Committee on Anaesthetic Mortality, which publishes a triennial review. By this means the
anaesthetic community is informed of those factors which have been involved in preventable mortality from anaesthesia.

8. Can Anaesthesia Always Be Completely Safe?

Despite continuous improvements in pre- and post-anaesthetic care, as well as the more gradual introduction of agents with greater margins of safety, absolute guarantees cannot be given that all patients will survive anaesthesia and surgery. When the disease process for which operation is required is extensive and advanced, the task may be insurmountable. There are also rare genetic and allergic conditions, not predictable in advance, which are unmasked or precipitated by anaesthesia, the outcome of which may be fatal despite skilful management.

Reference to the above tables reveals that of the 41 deaths in which anaesthesia played some part, 23 were non-preventable.

The 18 deaths which might have been prevented constitute a minute percentage of the total number of anaesthetics administered in New South Wales. Although an accurate figure cannot be arrived at from the available statistics (which do not code for each anaesthetic a patient might be given during a single hospital admission), the number is widely believed to be in excess of 1 million per year. If this figure is accepted as a denominator, it can be seen that preventable anaesthetic mortality is one per 60,000 administrations. A great majority of these patients were poor risks for surgery and anaesthesia.

However, the Committee believes that a better method of quantifying anaesthetic mortality is to use population as the denominator, since this is a reliable figure obtainable from the ABS.

In 2007, the population of NSW first reached 7 million. The incidence of preventable anaesthetic mortality was therefore 18 deaths per 7 million, i.e. 1 per 389,000. In epidemiological terms this is more conventionally expressed as 0.26 per 100,000.

This result confirms a consistent, albeit slowing decline over the period during which the Committee has been active.

Lest this extraordinary record of safety lead to complacency, the Committee believes that attention should be drawn to the number of deaths which occur in patients undergoing procedures under “sedation” administered by non-anaesthetists. In some instances drugs to produce “sedation” may be given without the presence of a medical practitioner other than the operator.

At this stage the magnitude of this “problem” is not quantifiable since the Act which requires notification of a death occurring within 24 hours of anaesthesia does not extend to procedures done under “sedation”. In the Committee’s opinion, it should, and suggests that the Department consult with the relevant bodies to consider an amendment to the Coroner’s Act.
## ANAESTHESIA MORTALITY

### GLOSSARY OF TERMS – CASE CLASSIFICATION

**A** Deaths Attributable to Anaesthesia

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>Where it is reasonably certain that death was caused by the anaesthesia or other factors under the control of the anaesthetist.</td>
</tr>
<tr>
<td>Category 2</td>
<td>Where there is some doubt whether death was entirely attributable to the anaesthesia or other factors under the control of the anaesthetist.</td>
</tr>
<tr>
<td>Category 3</td>
<td>Where death was caused by both surgical and anaesthesia factors.</td>
</tr>
</tbody>
</table>

**Explanatory Notes:**
- The intention of the classification is not to apportion blame in individual cases but to establish the contribution of the anaesthesia factors to the death.
- The above classification is applied regardless of the patient's condition before the procedure. However if it is considered that the medical condition makes a substantial contribution to the anaesthesia-related death subcategory H should also be applied.
- If no factor under the control of the anaesthetist is identified which could or should have been done better subcategory G should also be applied.

**B** Deaths In Which Anaesthesia Played No Part

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 4</td>
<td>Surgical death where the administration of the anaesthesia is not contributory and surgical or other factors are implicated.</td>
</tr>
<tr>
<td>Category 5</td>
<td>Inevitable death which would have occurred irrespective of anaesthesia or surgical procedure.</td>
</tr>
<tr>
<td>Category 6</td>
<td>Incidental death which could not reasonably be expected to have been foreseen by those looking after the patient, was not related to the indication for surgery and was not due to factors under the control of anaesthetist or surgeon.</td>
</tr>
</tbody>
</table>

**C** Unassessable Deaths

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 7</td>
<td>Those that cannot be assessed despite considerable data but where the information is conflicting or key data is missing.</td>
</tr>
<tr>
<td>Category 8</td>
<td>Cases which cannot be assessed because of inadequate data</td>
</tr>
</tbody>
</table>

### CAUSAL OR CONTRIBUTORY FACTORS IN CATEGORY A DEATHS

Note that this is common for more than one factor to be identified in the case of anaesthesia attributable death.

**SUB-CATEGORIES**

**A.** Pre-operative

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Assessment</td>
<td>This may involve failure to take an adequate history or perform an adequate examination or to undertake</td>
</tr>
</tbody>
</table>
appropriate investigation or consultation or make adequate assessment of the volume status of the patient in an emergency. Where this is also a surgical responsibility the case may be classified in Category 3 above.

(ii) Management

This may involve failure to administer appropriate therapy or resuscitation. Urgency and the responsibility of the surgeon may also modify this classification.

B. Anaesthesia Technique

| (i) | Choice or Application | There is inappropriate choice of technique in circumstances where it is contra-indicated or by the incorrect application of a technique which was correctly chosen. |
| (ii) | Airway Maintenance Including Pulmonary Aspiration | There is inappropriate choice of artificial airway or failure to maintain or provide adequate protection of the airway or to recognise misplacement or occlusion of an artificial airway. |
| (iii) | Ventilation | Death is caused by failure of ventilation of the lungs for any reason. This would include inadequate ventilator settings and failure to reinstitute proper respiratory support after deliberate hypoventilation (e.g. bypass) |
| (iv) | Circulatory Support | Failure to provide adequate support where there is haemodynamic instability, in particular in relation to techniques involving sympathetic blockade. |

C. Anaesthesia Drugs

| (i) | Selection | Administration of a wrong drug or one which is contra-indicated or inappropriate. This would include ‘syringe swap’ errors. |
| (ii) | Dosage | This may be due to incorrect dosage, absolute or relative to the patient’s size, age and condition and practice is usually an overdose. |
| (iii) | Adverse Drug Reaction | This includes all fatal drug reactions both acute such as anaphylaxis and the delayed effects of anaesthesia agents such as the volatile agents. |
| (iv) | Inadequate Reversal | This would include relaxant, narcotic, and tranquilising agents where reversal is indicated. |
| (v) | Incomplete Recovery | E.g. prolonged coma. |

D. Anaesthesia Management

| (i) | Crisis Management | Inadequate management of unexpected occurrences during anaesthesia or in other situations which, if uncorrected, could lead to death. |
| (ii) | Inadequate | Failure to observe minimum standards as enunciated |
Monitoring in the ANZCA Professional Documents or to undertake additional monitoring when indicated e.g. use of a pulmonary artery catheter in left ventricular failure.

(iii) Equipment Failure
- Death as a result of failure to check equipment or due to failure of an item of anaesthesia equipment.

(iv) Inadequate Resuscitation
- Failure to provide adequate resuscitation in an emergency situation.

(v) Hypothermia
- Failure to maintain adequate body temperature within recognised limits.

E. Post-operative

(i) Management
- Death as a result of inappropriate intervention or omission of active intervention by the anaesthetist or a person under their direction (e.g. Recovery or pain management nurse) in some matter related to the patient's anaesthesia, pain management or resuscitation.

(ii) Supervision
- Death due to inadequate supervision or monitoring. The anaesthetist has ongoing responsibility but the surgical role must also be assessed.

(iii) Inadequate Resuscitation
- Death due to inadequate management of hypovolaemia or hypoxaemia or where there has been a failure to perform proper cardiopulmonary resuscitation.

F. Organisational

(i) Inadequate supervision, inexperience or assistance
- These factors apply whether the anaesthetist is a trainee, a non-specialist or a specialist undertaking an unfamiliar procedure. The criterion of inadequacy of supervision of a trainee is based on the ANZCA Professional Document on supervision of trainees.

(ii) Poor Organisation of the Service
- Inappropriate delegation, poor rostering and fatigue contributing to a fatality.

(iii) Failure of interdisciplinary Planning
- Poor communication in peri-operative management and failure to anticipate need for high dependency care.

G. No Correctable Factor Identified

Where the death was due to anaesthesia factors but no better technique could be suggested.

H. Medical Condition of the Patient

Where it is considered that the medical condition was a significant factor in the anaesthesia related death.
AMERICAN SOCIETY OF ANAESTHESIOLOGISTS (ASA)

PHYSICAL STATUS CLASSIFICATION

P-1
A normal health patient

P-2
A patient with mild systemic disease

P-3
A patient with severe systemic disease

P-4
A patient with severe systemic disease that is a constant threat to life

P-5
A moribund patient who is not expected to survive without the operation

E
Patient requires emergency procedure

Website address:  www.asahq.org/clinical/physicalstatus.htm
Excerpted from American Society of Anesthesiologists "Manual for Anesthesia Department Organization and Management 2003-04"