



**ANZCA**

AUSTRALIAN AND NEW ZEALAND  
COLLEGE OF ANAESTHETISTS

# Safety of Anaesthesia

A review of anaesthesia-  
related mortality reporting  
in Australia and New Zealand  
2006-2008

Editor: Neville Gibbs, MBBS, MD, FANZCA



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Report of the Working Group convened under the auspices of the Australian and New Zealand College of Anaesthetists

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ISBN 978-0-9775174-6-6

# Foreword



Kate Leslie

Anaesthesia-related mortality reporting is important because it helps to ensure that Australia and New Zealand enjoy healthcare standards and outcomes that are among the best in the world. This is the eighth triennial report collated and published by the Australian and New Zealand College of Anaesthetists (ANZCA). In various formats, there has been reporting of deaths in association with anaesthesia since 1960. Reporting began in NSW (1960), with subsequent committees established in Victoria (1976), Queensland (1976), Western Australia (1978), South Australia (1987), and New Zealand (1981). The Australian committees' reports were first collated and published in 1985 under the auspices of the National Health and Medical Research Council (NHMRC). After two reports, ANZCA assumed responsibility for the triennial reports, which continue to this day.

This report includes data from four Australian states (NSW, Victoria, Western Australia and Tasmania). These mortality committees have been supported by the proclamation of confidentiality by the respective governments, and the cooperation of the state coroners. Mortality reporting is a badge of quality for healthcare systems and ANZCA is advocating that there should be regular reporting of anaesthesia-related mortality in all Australian states and territories and in New Zealand. This should be a priority for the respective governments. This report includes information on the current status of anaesthesia-related mortality reporting in each region.

The four states that have contributed to this report represent about two-thirds of the population of Australia. Overall, anaesthesia-related mortality in Australia has not changed significantly since the previous triennium, either in relation to population or the number of episodes of anaesthesia care. Deaths solely attributable to anaesthesia continue to fall, indicating that anaesthesia safety continues to improve. However, further research is required to reduce this figure even further, in particular into deaths in which no correctable factors were identified.

This report provides a rich source of information for anaesthetists, anaesthesia trainees and their supervisors, particularly the documentation of causal and contributory factors. The information will be disseminated to all appropriate bodies to contribute to further improvements in patient safety.

The efforts of all involved are gratefully acknowledged; without them, there would be no report. I particularly would like to acknowledge the work of the ANZCA Mortality Subcommittee and its Chair, Dr Neville Gibbs, regional mortality committees and reporting anaesthetists, as well as the cooperation of the coroners.

**Kate Leslie**  
President, ANZCA

## Mortality Subcommittee

The Mortality Subcommittee members who produced this report include the president of the Australian and New Zealand College of Anaesthetists (ANZCA), the chairs or co-ordinators of functioning state mortality committees, and other interested parties as listed:

### ANZCA President

Professor Kate Leslie

### ANZCA Vice President

Lindy Roberts

### Chairs or Coordinators of Functioning (2011) Australian State Anaesthesia Mortality Committees

Chair/Co-ordinator	Representing
Dr Neville Gibbs	Western Australia
Associate Professor Larry McNicol	Victoria
Dr David Pickford	New South Wales
Dr Margaret Walker	Tasmania
Professor W John Russell	South Australia/Northern Territory
Dr Leona Wilson	New Zealand

### Other Interested Parties

Dr James Troup	Queensland
Dr Stephen Brazenor	Australian Capital Territory
Professor Alan Merry	ANZCA
Associate Professor David Scott	ANZCA
Professor Barry Baker	ANZCA

### ANZCA Quality and Safety Officer

Ms Giselle Collins

Details on each jurisdiction, including (where available) Terms of Reference, legislative protection and information regarding Coronial Acts, can be found in the *State, Territory and National Information* section, starting on page 12.

## Executive Summary



Neville Gibbs

1. This is the eighth triennial report of anaesthesia-related mortality in Australia (the first being for the triennium 1985-1987)<sup>1-7</sup>. The format of the report is similar to previous reports, although it contains data from only four states (NSW, Victoria, Western Australia, and Tasmania). The ANZCA Mortality Subcommittee has supported these states in their collection of data and encouraged the establishment or re-establishment of anaesthetic mortality reporting in other Australian states and territories and in New Zealand.
2. While this report contains data from only four states, these four states include more than two-thirds of the population of Australia. The report is therefore likely to provide a reasonable estimate of anaesthetic mortality across Australia for this period.
3. Qld, SA, the NT, and the ACT did not provide anaesthetic mortality data for this report because they did not have functioning anaesthetic mortality committees during the 2006-2008 triennium. However, the SA committee was re-formed in September 2010, and Queensland Health is in the process of re-establishing an anaesthetic mortality committee (See state, territory and national information, page 12). It is hoped that the SA committee will receive data from the NT as it did in the past. Efforts are continuing in the ACT for the establishment of an anaesthetic mortality committee. New Zealand has established a perioperative mortality committee, and it is hoped that it will soon be contributing data that will be used in future triennial reports.
4. As with all anaesthesia mortality reporting, it should be appreciated that classification of anaesthesia-related deaths relies on expert opinion or consensus, and therefore remains subjective to some extent. It must also be recognised that some anaesthesia-related deaths may be missed despite the efforts made at individual, state and national levels. Nevertheless, due to the comprehensive processes in place in all four states reporting, it is unlikely that many cases were missed or classified incorrectly.
5. During the triennium, the number of anaesthesia-related deaths (categories one, two and three, Table 1) reported from the four states was 124. However, in only 19 cases were the deaths classified as category one (where it was considered 'reasonably certain' that death was caused by anaesthesia factors *alone*). In 23 cases there was 'some doubt' (category two), and in the remaining 82 cases, 'both anaesthetic and surgical' factors were implicated (category three). This represents a 6 per cent decrease in the percentage of category one cases compared to the previous triennium (15 per cent versus 21 per cent), and continues a trend toward lower numbers of category one cases observed over the last few triennial reports.
6. During the triennium, the combined population for the four states was about 14.8 million (Australian population statistics<sup>8</sup>, see Table 5). Using this figure, the anaesthesia-related mortality rate for these four states was about 2.79 deaths per million population per annum. This is about the same as the figure for the three states (NSW, Vic, and WA) in the previous triennium (2003-2005)<sup>7</sup>.
7. During the triennium there were about 6.88 million individual episodes of anaesthesia care in the four states. This figure was obtained from the Australian Institute of Health and Welfare (AIHW)<sup>9</sup>. The AIHW data were obtained from coders at all public and private hospitals. A coding hierarchy was used to ensure that only one anaesthesia item number was counted per episode of anaesthesia care<sup>9,10</sup>. Using this denominator, the anaesthesia-related mortality rate was 1:55,490 for the four states reporting (see Table 14). This figure is about the same as for the three states (NSW, Vic, WA) for the previous triennium (2003-2005; 1:53,426<sup>7</sup>).
8. The accuracy of the number of episodes of anaesthesia care obtained from the AIHW is supported by the relatively constant ratio between the number of episodes of anaesthesia care identified for each state and the population of each of the four states. The ratio ranged from 0.147 in NSW to 0.167 in Victoria. Moreover, the total number of episodes of anaesthesia care for the index year (2007/8) was 15 per cent higher than the number for the index year in the previous triennium (2004/5). This magnitude of increase was within expectations.
9. The profile of the anaesthesia-related deaths was similar to the previous triennium. The majority (79 per cent) occurred in older patients (age >60 years). Fifty-five per cent of cases were female. About one third were urgent or emergent. Only a small proportion (14 per cent) occurred in patients considered low risk (ASA P 1-2)<sup>11</sup>. As in previous years, most of the deaths occurred in patients undergoing orthopaedic procedures. For this triennium, cardiothoracic procedures were the next most common, followed by abdominal and vascular procedures. There were 17 cases involving endoscopy or other non-surgical procedures, or resuscitation. There were no cases related to pain management.
10. The percentage of deaths occurring in ward areas (12 per cent) was lower than the previous triennium (18 per cent). The majority of deaths occurred in an intensive care, high dependency unit, or operating theatre. As in previous reports, the majority of deaths occurred in metropolitan teaching hospitals (55 per cent), as would be expected with the acuity of the cases in these hospitals.

11. By far the majority of deaths involved specialist anaesthetists (86 per cent). Seven involved non-specialist (general practitioner) anaesthetists (6 per cent), and seven involved trainee anaesthetists (6 per cent). In three cases, no anaesthetist was in attendance. These cases involved proceduralists providing sedation for their own procedures. It is not possible to make any implications from these figures, as the total number of cases cared for by these various categories is not known.
12. In comparison to the previous report there was a further decrease in the number of anaesthetic causal or contributory factors (1.30 versus 1.58 per case). This was associated with a further increase in the percentage of cases in which no correctable factor was identified (49 per cent versus 33 per cent) and in the percentage of cases in which the patient's medical condition was considered a significant factor (71 per cent versus 58 per cent). These figures were heavily influenced by a large number of cases from NSW that were classified 3GH. (This classification typically describes extremely high-risk patients, in which the stress of surgery and anaesthesia most likely contributed to or hastened death, but in which the death was assessed as non-preventable, other than by withholding the surgery and anaesthesia).
13. Overall, the data indicate that anaesthesia-related mortality in Australia has not changed appreciably since the previous triennium, either in relation to population (see Table 5) or the number of episodes of anaesthesia care (see Tables 14 and 15). However, there was a further decrease in the number of category one deaths and in the number of cases in which there was a correctable factor. These latter figures indicate that anaesthesia as the sole cause of death is becoming even rarer in Australia, and that overall, anaesthesia safety is continuing to improve. Nevertheless, the relative increase in the number of cases in which there was no correctable factor indicates that further research is required to identify and develop safer drugs and techniques in anaesthesia.

**Neville Gibbs, FANZCA**  
Editor  
Chair, ANZCA Mortality Subcommittee

### Recommendations

The ANZCA Mortality Subcommittee makes the following recommendations:

1. Australians should be reassured that anaesthetic mortality rates in Australia remain extremely low, although there is no room for complacency, because the overall aim should be to avoid all anaesthesia-related deaths.
2. Patients, health authorities, anaesthetists, other physicians and healthcare workers should recognise the role of current anaesthesia training, accreditation, and continuing education and ongoing professional activities in achieving and maintaining low anaesthetic mortality rates.
3. Accurate anaesthetic mortality reporting should be a requirement for anaesthetists in all states and territories of Australia, and in New Zealand. Recent developments suggest that this goal is close to being achieved.
4. ANZCA and its ANZCA Mortality Subcommittee should continue to support and promote accurate anaesthetic mortality reporting throughout Australia and New Zealand. The importance of anaesthetic mortality reporting as part of a process to monitor and improve the quality and safety in anaesthesia should be recognised by all anaesthetists, hospital administrations, and healthcare authorities.
5. Anaesthesia care should be provided or supervised by specialist anaesthetists wherever possible, although the role and skills of accredited non-specialist anaesthetists in many regions is recognised. Particular care and additional resources are required for older, sicker patients undergoing major or urgent procedures, and these should extend well into the post-operative period.
6. As in previous reports, it should be emphasised that the majority of anaesthesia-related mortality is potentially avoidable and could be reduced by improvements in anaesthetic training, continued medical education, or the availability of further expertise or resources. However, it should also be recognised that not all anaesthetic mortality is avoidable with our current state of practice and knowledge. There is a small, but significant subset of cases in which only scientific advances will permit a further reduction in anaesthetic mortality.

## Methods

### Data collection

Confidentiality of information, an absolute requirement for all committees, was ensured by no primary data being examined in the compiling of the report.

#### 1. State Coronial Acts and the collection of data

Information relating to the various Coronial Acts can be found in the *State, Territory and National Information* section, page 12.

#### 2. Uniformity in analysing reports

To uphold uniformity between the states in analysing reports, the chairs of the state-based mortality committees have continued to use the agreed Glossary of Terms – Case Classification form wherever possible. The use of this classification system was agreed in March 2000 – see Appendix 1 to view the form in its entirety.

### System of classification

The system of classification and the term 'death attributable to anaesthesia' is defined in **Table 1** and the report focuses on deaths in which anaesthesia played a part, that is, categories one, two and three. For the most part, the term 'anaesthesia-attributable' has been replaced with 'anaesthesia-related' in this and other reports. It should be noted that the Victorian Consultative Council on Anaesthetic Mortality and Morbidity (VCCAMM) also uses this classification system to classify mortality. VCCAMM is the only state committee to collect data on morbidity as well as mortality.

**Table 1: System of classification by State-Based Anaesthesia Mortality Committees**

<b>Death Attributable To Anaesthesia</b>	
Category 1	Where it is reasonably certain that death was caused by the anaesthesia or other factors under the control of the anaesthetist.
Category 2	Where there is some doubt whether death was entirely attributable to the anaesthesia or other factors under the control of the anaesthetist.
Category 3	Where it is reasonably certain that death was caused by both surgical and anaesthesia factors.
<b>Explanatory Notes:</b>	
<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>	
<b>Death In Which Anaesthesia Played No Part</b>	
Category 4	Death where the administration of the anaesthesia is not contributory and surgical or other factors are implicated.
Category 5	Inevitable death, which would have occurred irrespective of anaesthesia or surgical procedures.
Category 6	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 the anaesthetist or surgeon.
<b>Un-assessable Death</b>	
Category 7	Those that cannot be assessed despite considerable data but where the information is conflicting or key data are missing.
Category 8	Cases that cannot be assessed because of inadequate data.

## Findings for NSW, VIC, WA and Tas

### Number of deaths classified

The total number of deaths reviewed by the four states for the triennium was **917**, of which **124** were considered to be wholly or partly related to anaesthetic factors (categories one-three, Table 1). Of the **917** cases reviewed, **22** were classified 'un-assessable' due to inadequate or conflicting data (category seven or eight, Table 1).

**Table 2: Number of deaths classified by each Committee**

	Total Classified	Category 1	Category 2	Category 3	Total Anaesthesia-Related
NSW	569	9	15	68	92
VIC	48	8	1	12	21
WA	230	1	5	1	7
TAS	70	1	2	1	4
Total	917	19	23	82	124

The disparity in total cases classified reflects both population differences and different requirements for reporting in different states (see *State, territory and national information*, page 12). The differences between states in relation to the various categories may represent some subjectivity in classification. There is less subjectivity, however, in relation to category one cases. \*The WA data are based on deaths reported during the triennium. The data from the other states are based on deaths that occurred during the triennium.

### Number of anaesthesia-related deaths (Category 1-3) in relation to population

**Table 3: Number of anaesthesia-related deaths during the 2006-2008 triennium, in relation to the population\* of NSW, Vic, WA, and Tas**

No. of deaths considered anaesthesia-related	124
Population of NSW, Vic, WA and Tas	(14.8 million)
No. of anaesthesia-related deaths per million population, 2006-2008	8.37
No. of anaesthesia-related deaths per million population per annum	2.79

\*Estimated resident population for 2007 (**Australian Bureau of Statistics**)<sup>8</sup> [NSW 6.92, Vic 5.24, WA 2.13, Tas 0.49 (x million)]. The 'estimated resident population' is considered more accurate than the Census figure.

The number of anaesthesia-related deaths per million population was similar to the previous report (2003-2005)<sup>7</sup>, in which there were approximately 2.73 anaesthesia-related deaths per million population per annum.

**Table 4. Number of anaesthesia-related deaths in comparison with previous reports**

	1997-99 <sup>5</sup>	2000-02 <sup>6</sup>	2003-05 <sup>7</sup>	2006-08
<b>NSW</b>	<b>56</b>	<b>67</b>	<b>53</b>	<b>92</b>
<b>Vic</b>	<b>32</b>	<b>39</b>	<b>40</b>	<b>21</b>
SA & NT	11	3	-	-
<b>WA</b>	<b>11</b>	<b>16</b>	<b>19</b>	<b>7</b>
Qld	20	12	-	-
Tas	-	-	-	4
Total	130	137	112	124

**Table 5: Number of anaesthesia-related deaths in relation to population in comparison to previous reports**

	1997-99 <sup>5</sup>	2000-02 <sup>6</sup>	2003-05 <sup>7*</sup>	2006-08 <sup>**</sup>
Population (x million)	13.40	13.75	13.68	14.80
Number of anaesthesia-related deaths	99	122	112	124
Anaesthesia-related death rate per million population per triennium	7.39	8.87	8.19	8.37
Anaesthesia-related death rate per million population per annum	2.46	2.96	2.73	2.79

Population source – **Australian Bureau of Statistics**<sup>8</sup> \*NSW, Vic, WA, \*\*NSW, Vic, WA, Tas

### Causal or contributory factors in anaesthesia-related deaths – see Appendix 1

The classifications by the state committees of the most likely causal or contributory factors in the anaesthetic-related deaths are summarised in Table 6.

**Table 6: Causal or contributory factors in anaesthesia-related deaths**

	NSW	VIC	WA	Tas	Total
<b>A Preoperative</b>	<b>17</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>23</b>
i assessment	11	2	1	1	15
ii management	6	2	0	0	8
<b>B Anaesthesia Technique</b>	<b>23</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>28</b>
i choice or application	10	2	1	0	13
ii airway maintenance	6	1	0	0	7
iii ventilation	1	0	0	0	1
iv circulatory support	6	0	0	1	7
<b>C Anaesthesia Drugs</b>	<b>17</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>25</b>
i selection	5	1	0	0	6
ii dosage	12	1	0	0	13
iii adverse event	0	4	0	1	5
iv incomplete reversal	0	0	0	0	0
v inadequate recovery	0	0	0	1	1
<b>D Anaesthesia Management</b>	<b>12</b>	<b>15</b>	<b>3</b>	<b>1</b>	<b>31</b>
i crisis management	5	4	1	0	10
ii inadequate monitoring	7	5	1	0	13
iii equipment failure	0	1	0	0	1
iv inadequate resuscitation	0	5	1	1	7
v hypothermia	0	0	0	0	0
<b>E Postoperative</b>	<b>11</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>26</b>
i management	6	2	2	3	13
ii supervision	3	1	1	3	8
iii inadequate resuscitation	2	1	2	0	5
<b>F Organisational</b>	<b>13</b>	<b>4</b>	<b>2</b>	<b>9</b>	<b>28</b>
i inadequate supervision or assistance	1	1	2	3	7
ii poor organisation	2	0	0	3	5
iii poor planning	10	3	0	3	16
<b>Total contributory factors</b>	<b>93</b>	<b>36</b>	<b>12</b>	<b>20</b>	<b>161</b>
<b>G No Correctable Factor</b>	<b>57</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>61</b>
<b>H Medical Condition of The Patient A Significant Factor</b>	<b>69</b>	<b>12</b>	<b>6</b>	<b>2</b>	<b>89</b>

In comparison to the previous triennium, the average number of causal or contributory factors per anaesthesia-related death was 1.30 (versus 1.58 in the previous report). The causal or contributory factors were spread across a wide range of potential factors. In comparison with previous reports there were slight reductions in categories A, B, and C, with slight increases in categories D and E.

In 61 cases (49 per cent) **no correctable factor could be identified** (category G). Most of these were from NSW. This percentage was higher than in the previous report (33 per cent). This finding indicates that a larger percentage of anaesthetic-related deaths occurred **despite optimal anaesthetic management** within our current state of knowledge. In other words, in only about 50 per cent of anaesthesia-related deaths could a correctable factor can be identified. This observation is in keeping with the increase in the number of deaths (89, 71 per cent) in which the medical condition of the patient was considered a significant factor (category H).

**Gender**

As was observed in the 2003-2005 report, there were more females than males (68, 55 per cent).

**Age**

**Table 7: Age distribution in anaesthesia-related deaths**

Age (Years)	NSW	VIC	WA	TAS	Total
<11	3	0	0	0	3
11-20	0	0	0	1	1
21-30	2	1	0	0	3
31-40	1	1	0	0	2
41-50	1	2	1	0	4
51-60	7	4	1	1	13
61-70	11	2	0	0	13
71-80	24	7	0	0	31
81-90	31	4	2	1	38
>90	11	0	3	1	15
Missing	1				
<b>Total</b>	<b>92</b>	<b>21</b>	<b>7</b>	<b>4</b>	<b>124</b>

No anaesthesia-related deaths were recorded in children under one year of age (although NSW recorded two deaths in children under two). The majority of the deaths occurred in patients over the age of 60 years (79 per cent). Over two-thirds occurred in patients over 70 years of age, and over 40 per cent in patients over 80 years of age.

**Level of risk**

The level of risk was stratified using the American Society of Anesthesiologists (ASA) physical status classification<sup>11</sup>

**Table 8: Level of risk of patients by ASA physical status**

ASA physical status	NSW	VIC	WA	TAS	Total
1	1	0	0	0	1
2	5	9	1	1	16
3	23	4	3	3	33
4	38	7	3	0	48
5	11	1	0	0	12
Unknown	14	0	0	0	14
<b>Total</b>	<b>92</b>	<b>21</b>	<b>7</b>	<b>4</b>	<b>124</b>

In 14 cases, the patient's ASA physical status was missing. Of the remaining cases, about 55 per cent occurred in patients with the highest levels of risk (ASA P four-five). However, there were 17 low-risk patients (ASA P one-two). This was similar to the previous triennium.

**Table 9: Degree of urgency of the procedure with anaesthesia-related deaths**

Urgency	NSW	VIC	WA	TAS	Total
Elective	62	13	4	2	81
Urgent/emergent	28	8	3	2	41
Missing	2	0	0	0	2
<b>Total</b>	<b>92</b>	<b>21</b>	<b>7</b>	<b>4</b>	<b>124</b>

About 33 per cent of the anaesthesia-related deaths occurred in patients having procedures classified as urgent or emergent. This represents a decrease compared to the previous triennium (33 per cent versus 50 per cent). Nevertheless, it is still unlikely that the total number of urgent or emergency procedures exceeded one third of all procedures. Therefore, urgent or emergent procedures remain a likely risk factor for anaesthesia-related deaths. This may relate to the unstable condition of these patients, the inadequate opportunity for complete preoperative assessment, or a requirement for continued resuscitation at the same time of the administration of anaesthesia.

**Type of Hospital**

**Table 10: Type of Hospital**

	Metropolitan Public Teaching	Metropolitan Non-Teaching	Rural Base	Rural Public Other	Private	Day Care (free standing)
NSW	51	23	0	8	10	0
VIC	8	0	6	4	3	0
WA	5	0	1	0	1	0
TAS	4	0	0	0	0	0
<b>Total</b>	<b>68</b>	<b>23</b>	<b>7</b>	<b>12</b>	<b>14</b>	<b>0</b>

As in previous reports, the majority of anaesthesia-related deaths occurred in metropolitan teaching hospitals. This was not unexpected because these hospitals most likely treat the majority of urgent and emergency patients. They also undertake the bulk of the more complex procedures, which are usually performed on older, sicker patients, often with a higher risk.

**Location of death**

**Table 11: Location of death**

	Operating Theatre	PACU	Procedural Room	ICU/HDU	General Ward	Other
NSW*	28	10	3	41	9	0
VIC	7	0	0	10	2	2
WA	2	1	0	2	1	1
TAS	1	0	0	0	3	0
<b>Total</b>	<b>38</b>	<b>11</b>	<b>3</b>	<b>53</b>	<b>15</b>	<b>3</b>

\*data missing for one case.

The majority of the deaths occurred in an intensive care or high dependency unit (37%). A large proportion also occurred in an operating theatre (36%). The remainder occurred in a ward area (18%), in a theatre recovery room (8%), or in a procedural room (2%) – all figures rounded.

Note that the 'location of death' does not necessarily indicate the location of the anaesthesia-related event. The location of the anaesthesia-related event most commonly occurred in an operating theatre (72 per cent). Seven per cent occurred in an induction room, 7 per cent in a high-dependency unit, and 4 per cent in a post-anaesthesia care unit.

**Grade of anaesthetist**

**Table 12** shows the grade of the anaesthetist. In cases during which two or more anaesthetists were involved, the grade of anaesthetist was taken as the principal anaesthetist involved, as indicated in individual anaesthetists' reports.

**Table 12: Grade of anaesthetist**

	Specialist	GP Non-Specialist	Trainee/Registrar	Other
NSW*	80	2	6	3
VIC	15	5	1	0
WA	7	0	0	0
TAS	4	0	0	0
<b>Total</b>	<b>106</b>	<b>7</b>	<b>7</b>	<b>3</b>

\*data missing for one case.

The anaesthesia for the majority of cases was provided by specialist anaesthetists (86 per cent). This finding is expected as most anaesthetics in Australia are provided by specialist anaesthetists, especially for patients undergoing major procedures in teaching hospitals. Of the 'other' category, at least two involved sedation administered by the proceduralist with no anaesthetist in attendance. 'Other' refers to sedation provided by the procedural team (for example, respiratory physician, gastroenterologist, or radiologist).

**Type of surgery or procedure**

**Table 13: Type of surgery or procedure**

	NSW	VIC	WA	TAS	Total
Abdominal	10	2	2	1	15
Cardiothoracic	16	0	1	0	17
Vascular	10	1	1	1	13
Neurosurgical	1	0	0	0	1
Orthopaedic	34	6	1	2	43
Urological	2	0	1	0	3
General (non abdominal)	2	7	0	0	9
ENT/head and neck	2	1	1	0	4
Ophthalmological	0	0	0	0	0
Renal	0	0	0	0	0
Gynaecological	0	1	0	0	1
Dental	1	0	0	0	1
Endoscopic	11	1	0	0	12
Pain management	0	0	0	0	0
Obstetric	0	0	0	0	0
Other (for example, resuscitation, electroconvulsive therapy, invasive monitoring, procedure not commenced)	3	2	0	0	5

As in the previous triennium, the most common procedures were orthopaedic (35 per cent), cardiothoracic (14 per cent) and abdominal (12 per cent). Other common procedures were vascular, general (non-abdominal) and endoscopic. It should be noted that the definition of anaesthesia-related deaths is such that the surgical procedure should not be a direct factor. Care should be taken in attempting to interpret these data, because denominators for each procedure are not known, and the relative levels of risk of patients presenting for various procedures are also not known.

**Number of anaesthetics administered**

As in the previous report, the total number of 'episodes of anaesthesia care' (denominator) was obtained from the Australian Institute of Health and Welfare (AIHW)<sup>9</sup>. The AIHW receives coding (ICD-10) on all medical procedures, including anaesthetic procedures, from coders at all public and private hospitals in Australia. As there is often more than one anaesthesia item and code for any single episode of anaesthesia care, AIHW applied a hierarchy to ensure that only one code was counted for each episode. The total number of episodes of care between July 1, 2007 and June 30, 2008 inclusive was then obtained. In order to estimate the denominator for the triennium, this one-year figure was multiplied by three. This information is presented in **Table 14**.

**Hierarchy used by coders**

This hierarchy follows the Australian Coding standards of the National Centre for Classification in Health<sup>10</sup>

**ACS 0031**

**Classification, point 1**

If more than one anaesthetic from block [1910] Cerebral anaesthesia and/or block [1909] Conduction anaesthesia is administered in a 'visit to theatre' (including different anaesthetics for different procedures), assign only one code from each block using the following hierarchies (listed from highest priority to lowest):

**[1910] Cerebral anaesthesia**

- i. General anaesthesia (92514-XX)
- ii. Sedation (92515-XX)

**[1909] Conduction anaesthesia**

- i. Neuraxial block (92508-XX)
- ii. Regional blocks (codes 92509-XX, 92510-XX, 92511-XX, 92512-XX)
- iii. Intravenous regional anaesthesia (92519-XX)

**Table 14: Estimated number of anaesthetics administered in the four states and the estimated anaesthesia mortality rate per number of procedures**

	NSW	VIC	WA	TAS	Total
No. anaesthetics July 1, 2007 – June 30, 2008* **	<b>1,011,988</b>	<b>875,754</b>	<b>328,564</b>	<b>77,321</b>	<b>2,293,627</b>
Estimate for the triennium	3,035,964	2,627,262	985,692	231,963	<b>6,880,881</b>
No. anaesthetic-related deaths (triennium)	92	21	7	4	124
No. anaesthetics per death	33,000	125,108	140,813	57,991	55,490

\*AIHW<sup>9</sup> www.aihw.gov.au

\*\* Australian Hospital Statistics, July 1, 2007 – June 30, 2008. Procedures in ICD-10-AM groupings: 1333; 9250610-9250799: 1909; 9250810-920899:1910; 9251910-9251999; 9251410-9251599. These include general, neuroaxial, and combined anaesthetic procedures, intravenous regional anaesthesia, and sedation; total public and private from NSW, VIC, WA, and Tasmania.

For the purposes of this report 'episodes of anaesthesia care' applied only when anaesthesia was being provided for a surgical, diagnostic, or other interventional procedure. It excludes isolated nerve blocks, because it is likely that the majority of nerve blocks identified outside the hierarchy used would have been performed for analgesia alone. It is possible that this methodology misses nerve blocks that were used to provide the sole anaesthesia for a small proportion of surgical procedures. However, it is likely that the number of such cases would be small in relation to the total number of cases, and would have little effect on the overall anaesthetic mortality rate. This approach was the same as the previous report.

**Incidence of death related to anaesthesia**

**Numerator (number of anaesthesia-related deaths)**

To obtain an accurate numerator it is necessary to identify all anaesthesia-related deaths and classify them correctly. As in previous reports, all four states participating had comprehensive procedures in place to assess and record anaesthesia-related mortality. Nevertheless, there is no way of ascertaining whether all anaesthesia-related deaths were reported or classified correctly. Therefore the numerator must be considered a best estimate. On the other hand, it was felt by all state committees that it was unlikely that a large number of cases were missed or classified incorrectly.

**Denominator (total number of anaesthesia episodes of care)**

The method used to obtain data on the total number of anaesthetic episodes of care was similar to the previous triennium. This method uses ICD-10 codes identified at individual hospital levels and reported to the AIHW. While this method is considered to be the most accurate available in Australia at present, the possibility of a small proportion of incorrect or incomplete coding must be considered. Therefore, the denominator is also a 'best estimate'.

**Anaesthesia-related mortality rate**

The estimated anaesthesia-related mortality for the four reporting states was 1:55,490 procedures. This is similar to the rate for the previous triennium, when only NSW, Vic, and WA reported. Overall, the anaesthesia-related mortality rate has been relatively unchanged over the last three triennial reports (**Table 15**).

**Table 15: Estimated anaesthesia-related mortality in relation to number of procedures compared to previous reports**

	2000-02*	2003-05**	2006-08***
Estimated total number of anaesthesia procedures x million	7.65	5.98	6.88
Number of anaesthesia-related deaths	122	112	124
Anaesthesia-related death rate	1:56,000	1:53,426	1:55,490

\*All Australian states \*\* NSW, Vic, WA \*\*\* NSW, Vic, WA, Tas

**Incidence of death in patients considered to be low or fair risk**

**Table 16: Incidence of death in patients considered to be low or fair risk**

Triennium	Number of ASA P 1-2 patients	Total Number of Category 1-3 Deaths	Percentage of deaths considered at low or fair risk
1991-93	30	116	26%
1994-96	13	135	9.6%
1997-99	19	130	14.6%
2000-02	26	137	18.9%
2003-05	18	112	16.1%
2006-08	19	124	15.3%

This table demonstrates that the number of deaths occurring in patients at low or fair risk remains low.



## State, Territory and National Information

### New South Wales, Australia

#### Overview

The Special Committee Investigating Deaths under Anaesthesia (SCIDUA) has operated continuously in NSW since 1960, apart from a short period in the early 1980s due to problems of confidentiality. SCIDUA was re-established in July 1983 when legislative protection provided further privilege. While legislation has provided mandatory reporting of anaesthesia related deaths, the committee has had some success in encouraging reporting of sedation related deaths.

#### Composition (2006-2008)

During this reporting period, SCIDUA had 20 members who were nominated by:

- The Australian and New Zealand College of Anaesthetists, NSW Regional Committee.
- The Australian Society of Anaesthetists.
- The Department of Anaesthetics, University of Sydney.
- The Department of Surgery, University of NSW.
- The Department of Surgery, University of Sydney.
- The Division of Anaesthesia and Intensive Care, University of Newcastle.
- The Royal Australian & New Zealand College of Obstetricians & Gynaecologists.
- The Royal College of Pathologists of Australia.

All members were appointed by the NSW Minister for Health.

SCIDUA is supported by a Clinical Excellence Commission appointed secretariat that also works with the Collaborating Hospitals' Audit of Surgical Mortality.

#### Terms of Reference

- To register, investigate and classify deaths occurring during or within 24 hours of a procedure performed under anaesthesia or sedation.
- To determine whether further information is required to complete the above investigation, and if so, to request such information under guarantee of confidentiality from the attending practitioner(s).
- To examine information acquired and identify any issues of management which were instrumental in the patient's death.
- To report the committee's findings confidentially to the practitioners involved in the patient's care.
- To report annually to the Minister for Health, drawing attention to any matters which require action to improve the safety of anaesthesia and sedation in New South Wales.
- To acquaint the medical profession in general and anaesthetists in particular to any matters to which special attention needs to be paid to ensure the safety of anaesthesia and sedation.
- To submit for publication in appropriate peer-reviewed journals the results of the committee's investigations in such a way as to preserve undertakings of confidentiality given to respondents.
- To make available the expertise of its members to the Clinical Excellence Commission in pursuit of systemic improvements to patient care in the fields of anaesthesia and sedation.

#### Legislative Protection

The Health Administration Act 1982 Section 23 re-established confidentiality to the committee, as it gave the minister authority to gazette special privilege to any specified person, committee or advisory body investigating morbidity and mortality. Further protection is provided in the Freedom of Information Act 1989 Schedule 1 Sections 8, 12, 13, which exempts the committee's documents from public access.

#### Reporting of anaesthesia-related deaths

Between 2006 and 2008, SCIDUA received notification of deaths directly from anaesthetists and medical practitioners and also the Office of the State Coroner pursuant to section 12B of the Coroners Act 1980:

*"The person died while under, or as a result of, or within 24 hours after the administration of, an anaesthetic administered in the course of a medical, surgical or dental operation or procedure or an operation or procedure of a like nature, other than a local anaesthetic administered solely for the purpose of facilitating a procedure for resuscitation from apparent or impending death".*

Deaths were reported to SCIDUA using the "Form B: Report of Death Associated with Anaesthesia/Sedation".

#### Review of notified deaths

All notifications are reviewed by the triage sub-committee, comprising two or more members of the committee. The triage process can classify the death as due to factors outside of the control of the anaesthetist or a request is made for further information from the reporting medical practitioner using a questionnaire. When the questionnaire is received the information is de-identified, copied and distributed to members of the committee for discussion at the next meeting. Cases are discussed at each meeting and classified using the National Anaesthetic Mortality Classification.

A confidential report by the chair is sent to the medical practitioner explaining the committee's decision.

#### Current developments (2009-2011)

There have been several major legislative changes relating to the notification process to SCIDUA, including:

- A review of the Coroners Act 1980 resulted in the removal of the reporting requirement of anaesthesia-related deaths to the coroner in the Coroners Act 2009, unless the death was not the reasonably expected outcome of a health-related procedure carried out in relation to the person.
- To ensure that anaesthetic mortality reporting and monitoring continued, the Public Health Act 1991 and Public Health (General) Regulation 2002 were amended to make a death occurring 'while under, or as a result of, or within 24 hours after the administration of, an anaesthetic administered in the course of a medical, surgical or dental operation or procedure or an operation or procedure of a like nature (other than a local anaesthetic administered solely for the purpose of facilitating a procedure for resuscitation from apparent or impending death)' ('Anaesthesia-related deaths') a Category 1 Scheduled Medical Condition, and hence reportable.

- From January 1, 2010, anaesthetists were required to report anaesthesia related deaths to the Director-General of NSW Health by completing the Report of Death Associated with Anaesthesia/Sedation (SCIDUA Notification Form) and submitting it to SCIDUA.
- SCIDUA has considered sedation-related mortality to be equally as important as anaesthesia-related mortality and made a submission to the review of the Public Health Act 1991 to formalise the reporting of sedation related deaths to SCIDUA. The changes appear in the Public Health Act 2010, which was assented by the NSW Government in December 2010. Section 84 of the Public Health Act 2010 requires the chief executive officer, and the health practitioner responsible for the administration of the anaesthetic or sedative drug concerned, to notify the death to the director-general by completing the Report of Death Associated with Anaesthesia/Sedation (SCIDUA Notification Form). The new act includes a penalty for non-compliance. The Public Health Act 2010 is scheduled for commencement in early 2012.

#### Dr David Pickford, FANZCA

Chair

Special Committee Investigating Deaths Under Anaesthesia in New South Wales

### Victoria, Australia

#### Overview

The Victorian Consultative Council on Anaesthetic Mortality and Morbidity (VCCAMM) was established in 1976 under section 13 of the Public Health Act 1958 and the legislative provisions have recently been updated in sections 33-43 of the Public Health and Wellbeing Act 2008.

#### Composition (2006-2008)

- The chair: a specialist anaesthetist nominated by the Australian and New Zealand College of Anaesthetists, recommended by the minister and appointed by cabinet.
- Sixteen specialist anaesthetists, appointed by the minister, comprising three nominated by the Australian and New Zealand College of Anaesthetists, three by the Australian Society of Anaesthetists, and 10 (including a rural practitioner) by the Victorian teaching and regional hospitals.
- Six additional members, appointed by the minister, comprising a nominated representative from each of the Royal Australasian College of Surgeons, the Australian and New Zealand Intensive Care Society and/or the College of Intensive Care Medicine, the Royal College of Pathologists of Australasia and/or the Victorian Institute of Forensic Medicine, the Australasian College of Emergency Medicine, the Royal Australian College of General Practitioners and/or the Rural Visiting Medical Officer, and the Department of Health.

The council is supported by a confidential project officer appointed by the Department of Health.

#### Terms of reference

- To monitor, analyse and report on key areas of potentially preventable anaesthetic mortality and morbidity within the Victorian hospital system.
- To keep a register of anaesthetic mortality and morbidity within the Victorian hospital system.
- To liaise with other consultative councils on issues of common concern, including the development of appropriate systems for reporting of relevant cases by practitioners.
- To improve the practice of anaesthesia by publication and dissemination of relevant information and practical strategies identified during deliberations of the council.
- To report as required to the Minister for Health and to the Victorian Quality Council.
- To respond to specific matters referred to the council by the minister for investigation and reporting, as required.

The VCCAMM is the only state mortality committee that also has a brief to report on significant morbidity associated with anaesthesia.

**Legislative protection and opportunity for enhanced reporting**

The VCCAMM operates pursuant to the Public Health and Wellbeing Act 2008 and there has also been a recent change in coronial legislation under the Coroners Act 2008.

The revised provisions of the Health Act 2008 have taken into account the essential requirement for: (i) preservation of confidentiality, as well as recognising the need to: (ii) improve systematic reporting of potentially anaesthesia-related morbidity and mortality. Historically, in the Victorian coronial legislation, there has been considerable confusion regarding the definition of reportable deaths, particularly for deaths that may have been deemed to be associated with anaesthesia, and this has been addressed through: (iii) improved coronial legislation.

**Preservation of confidentiality**

The council is aware that reporting of mortality and morbidity has always been voluntary and that the speciality of anaesthesia has a long history of participation in audit and quality assurance activities. The level of reporting has remained constant over many years, due mainly to the high level of trust between practising anaesthetists and the council. Sections 42 and 43 describe the confidentiality obligations, which preclude the identification of a person from whom, or in relation to whom, the information was obtained. In addition to these legislative confidentiality provisions, the council has imposed an additional layer of security in that only the council chair and the council's confidential project officer are privy to the identity of the reporting practitioner, the patient, and the hospital. All identifiable information is deleted from the case reports prior to presentation to council for deliberation. However, it remains important for the council chair to have direct contact with the reporting anaesthetist in order to obtain the most accurate information regarding the case.

**Enhanced systematic reporting**

Although there is a strong track record of spontaneous direct reporting by anaesthetists, it is important to maximise the level of case acquisition as required by the council's terms of reference. There are new sections in the legislative provisions, which are designed to improve the systematic reporting of anaesthesia related mortality and morbidity Victorian hospitals. Under section 39 of the Public Health and Wellbeing Act 2008 the council chair may request, by written notice, a health-service provider, to provide general or specific information (anaesthesia-related morbidity or mortality). Under section 40, the health service provider must provide such requested information. In August 2010, letters were sent from the chair of council to all health services in Victoria, outlining these requirements. It is anticipated that compliance with this legislation will be achieved through hospital department of anaesthesia quality assurance coordinators and it is hoped this will increase the overall level of reporting.

**Improved coronial legislation**

The new Coroners Act 2008 includes improved definitions of reportable deaths, and in part 1, section 4, 2 (b), a reportable death includes, a death that occurs – during a medical procedure; or following a medical procedure where the death is or may be causally related to the medical procedure – and a registered medical practitioner would not, immediately before the procedure was undertaken, have reasonably expected the death.

Included within the term “medical procedure” is any diagnostic or therapeutic procedure as well as the administration of any anaesthetic, including general, local, conscious sedation, regional anaesthetic, intensive care sedation, spinal or epidural anaesthetic or other.

The council welcomes this improved definition of reportable death and it is more specifically aligned with our own definitions of anaesthesia-related mortality. Under the new arrangements with the Coroners Court of Victoria, the chair of council has access to the medical depositions submitted to the coroner in all cases in which any of the above anaesthetic administrations has occurred. The chair can then screen all such depositions and, when deemed appropriate, further information can be obtained for cases that require deliberation by council.

**Current developments (2009-2011)**

The major issue in Victoria is the low number of overall deaths reviewed (48) and the reduction of anaesthesia-related deaths from 40 in 2003-2005 to 21 in 2006-2008. Although this might be due to a genuine reduction, the more likely explanation is under reporting, and especially reduced access to cases reported to the state coroner. The council has recently established a mechanism for improved access to coronial reports from deaths that have occurred in the setting of administration of any anaesthetic, including general, local, conscious sedation, regional anaesthetic, intensive care sedation, spinal or epidural anaesthetic or other. It is hoped that this will overcome the recent deficiency in access to Victorian coronial cases.

The VCCAMM will also continue to liaise with health-service providers to seek compliance with the new legislation in the provision of reports of potentially anaesthesia-related mortality and morbidity.

The council is awaiting the much overdue launch of a web-based electronic reporting tool with a direct link to a new database.

**Associate Professor Larry McNicol FRCA, FANZCA**

Chair  
Victorian Consultative Council on Anaesthetic Mortality and Morbidity

**Western Australia**

**Overview**

The Anaesthetic Mortality Committee (AMC) of Western Australia was established in 1978 by proclamation of the Health Act Amendment Act 1978. The committee consists of five permanent and seven provisional members. For any particular meeting, the chair, having regard to the cases to be discussed, invites two provisional members to make up, with permanent members, a committee of seven. In addition to the committee, the minister appoints a specialist anaesthetist as investigator.

**Composition**

The five permanent members of the committee are:

- A person nominated by the state branch of the Australian and New Zealand College of Anaesthetists, who is also chair of the committee.
- A medical practitioner nominated by the Executive Director of Public Health.
- A specialist anaesthetist nominated by the senate of the University of Western Australia.
- A specialist anaesthetist nominated by the state branch of Australian Society of Anaesthetists.
- A specialist anaesthetist nominated by the state branch of Australian Medical Association.

The seven provisional members are:

- A specialist obstetrician and gynaecologist nominated by the state branch of the Australian council of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists.
- Two general practitioners with a special interest in anaesthesia, nominated by the state branch of the Royal Australian College of General Practitioners.
- A specialist surgeon nominated by the state branch of the Royal Australasian College of Surgeons.
- A registered midwife nominated by the state branch of the Royal Australian Nursing Federation.
- A dental practitioner nominated by the state branch of the Australian Dental Association.
- The professor of clinical pharmacology of the University of Western Australia.

**Reporting of deaths related to anaesthesia**

All deaths occurring within 48 hours of an anaesthetic or deaths where the anaesthetic is thought to have been a contributing factor must be reported to the Executive Director of Public Health.

The Executive Director of Public Health, on receipt of a report of such a death, directs the investigator to enquire into the circumstances of the death. If the investigator finds that the death is not likely to have been due to the anaesthetic, he or she reports this to the Executive Director of Public Health, and that, so far as the AMC is concerned, is the end of the matter. If the investigator is of the opinion that the death is likely to have been due in some measure to the anaesthetic, he or she prepares a case report for the chair of the committee.

**Scope of the investigator**

The investigator receives a report from the anaesthetist concerned. It is usually possible to make a decision based on this report. If not, the investigator may request further information. This is usually in the form of the hospital file and the autopsy report, which are always made available by the relevant authorities. The investigator may also interview the anaesthetist or any other persons likely to assist in the investigation. No one else on the committee is entitled to communicate with any person mentioned in the investigator's report unless that person makes a request in writing.

**Calling a meeting**

The chair, having received the report, invites all permanent members and selects at least two provisional members to make up a committee of at least seven. The report is then considered by the committee, which reaches a consensus opinion on the cause of death and whether the conduct of the anaesthetic played any part.

**Legislative protection/confidentiality**

The report of the investigator to the chair is in the form of a medical report with identification of persons and places removed. The chair knows the name of the anaesthetist as he or she has to write to the anaesthetist after the meeting. There are strict guidelines for dealing with the material collected by the committee in a confidential manner. When the committee has completed its deliberations, the material must be returned to the Executive Director of Public Health for safe custody. The reports of the investigator and the determinations of the committee may be disseminated for educational purposes, provided that persons involved are not identifiable. The information used by the committee and its opinions about that information are not admissible in any court of any kind, and no person furnishing information to the committee is liable in any action for damages.

The only exception to the confidentiality clauses are the provisions of the Coroners Act, whereby the adducing of evidence for a serious offence would take precedence over the confidentiality clauses of the Health Act. With this in mind, the committee has always deferred any discussion of deaths related to anaesthesia until the coroner has brought down his or her report. The Freedom of Information Act 1992 opened a way for the public to breach the confidentiality of the committee. However, under the Health Services (Quality Improvement) Act, 1994, the AMC was exempted from the provisions of the Freedom of Information Act. The members of the committee believe that the Acts provide watertight protection for its deliberations and those involved in them.

**Coroners Act 1996**

The death occurs during or as a result of an anaesthetic (and is not due to natural causes).

**Current developments (2009/2011)**

1. There have been no significant changes to the function of the West Australian Anaesthetic Mortality Committee since the last triennial report. The committee continues to seek alternative mechanisms to identify deaths within 48 hours of anaesthesia, although if and when such a mechanism is in place, it will continue to seek information provided by the anaesthetists involved in these cases.
2. The West Australian Anaesthetic Mortality Committee recognises that its data for the current triennium differs slightly from other states in that it represents deaths reported during the triennium, as opposed to deaths that occurred during the triennium. This decision was made because there were several deaths that occurred during the triennium that are still awaiting investigation by the WA coroner, and the West Australian Anaesthetic Mortality Committee does not assess cases until after coroner's investigations have been completed. It is hoped that this situation will not occur in future reports.

**Dr Neville Gibbs, FANZCA**

Chair  
Anaesthetic Mortality Committee of Western Australia

**Tasmania**

**Overview**

During the triennium of 2006-2008, Tasmania, mortality data was collected and reviewed by the Tasmanian Audit of Anaesthesia Mortality. The audit is being run in tandem with the Tasmanian Audit of Surgical Mortality (TASM), for a number of reasons including:

- I. Sharing of resources including staff, office space, consumables and software.
  - II. Funding approval from the state government was easier to secure for a joint audit, as funding was already in place for the surgical audit, and additional funding for the anaesthesia audit was small in comparison (the initial establishment costs for the surgical audit having been met by RACS).
  - III. Ease of identifying cases – surgical audit office is notified of all deaths occurring in Tasmania within 30 days of a surgical procedure, so capture rate for post-surgical deaths is high.
1. The anaesthetic proforma for data collection has been significantly modified so that data collected is that which is required for the ANZCA triennial report.
  2. Modifications to the database software which were required in order to record the data required by ANZCA for the triennial report was completed and data is now being entered onto the electronic database.
  3. As participation in a mortality audit is now a requirement of the state government for all medical practitioners employed in the public sector, 90 per cent of anaesthetists in Tasmania are now aware of and happy to participate in the audit.
  4. The review process is based on a first line assessment of the initial de-identified reporting proforma by a volunteer reviewer, with case note review if requested by the first-line assessor performed by a different second-line assessor. There were some initial concerns about ability to retain anonymity within the small Tasmanian anaesthetic community, but these have proven unfounded to date. The two-person review process enables us to report back to the individual practitioner within six weeks of the initial report with a final determination on their case.
  5. The audit is coordinated by a committee consisting of representatives from the three main regions (health department regions) of the state.
  6. The information collected by TASM is protected by Commonwealth privilege under Part VC of the *Health Insurance Act 1973* and may only be used for quality assurance purposes. It is also protected from disclosure to any person outside the committee by Tasmanian Government qualified privilege under the section four of the Health Act 1997.
  7. Terms of reference – see below.
  8. Current coronial act is Tasmanian Coroner's Act 1995, in which a reportable death is defined as a death occurring under anaesthesia or sedation, or occurring as a result of anaesthesia or sedation and is not due to natural causes

**Terms of reference ('Objects')**

The 'Tasmanian Audit of Surgical Mortality Safety and Quality Committee' function with the following Terms of Reference (enacted 2006):

1. The objects of the committee shall be:
  - 1.1. To provide leadership and strategic direction for the development and implementation of the Tasmanian Audit of Surgical Mortality (TASM).
  - 1.2. To oversee the TASM's affiliation with the Western Australian Audit of Surgical Mortality (WAASM) and the proposed national safety and quality surgical mortality audit body which is currently a cross-jurisdictional body.
  - 1.3. To participate in a cross-jurisdictional/national surgical mortality audit process to establish standardised reporting protocols and analytical methodology for comparison of surgical mortality among the states and territories in Australia.
  - 1.4. To promote the use of the independent audit of surgical mortality among all Tasmanian surgeons.
  - 1.5. To compare surgical mortality outcomes in Tasmania with other Australian states and territories, and with international standards.
  - 1.6. To collaborate with the WAASM and the cross-jurisdictional/national body in the management of surgical death audit processes.
  - 1.7. In collaboration with the cross-jurisdictional/national project, to develop best practice standards and guidelines for surgical practice in hospitals based on scientific knowledge of clinical efficacy;
  - 1.8. To assist in the wide dissemination of best practice standards and guidelines for surgical practice in hospitals, as provided by the cross-jurisdictional/national body.
  - 1.9. To provide direction and support for first level evaluations of surgical mortality reported on a voluntary basis by participating surgeons.
  - 1.10. To coordinate the transfer of de-identified information (case notes) to the cross-jurisdictional/national body for surgical mortality data evaluated as warranting second level audit.
  - 1.11. To monitor and evaluate the implementation of recommendations made by the committee for the improvement of surgical care.
  - 1.12. To engage in any other activities that are consistent with the objectives of the committee.
  - 1.13. To publish journal articles, educate surgeons, and/or provide information to the general public deemed appropriate by the committee, in each case using de-identified data.
  - 1.14. In light of discharging the preceding functions, reviewing and recommending improvement to working practices and systems within both Tasmania and other jurisdictions.

- 1.15. To communicate as may be necessary or appropriate with any other committee declared by the minister under s 4(1) of the Health Act, 1997, to be a Quality Assurance Committee for the purposes of that act in relation to any matter which falls within the functions of either committee.
- 1.16. To report in accordance with these terms of reference.

**Current developments (2009/2011)**

The terms of reference have been updated for 2011 (see [www.racs.edu.au/racs/research-and-audit/audits-of-surgical-mortality/tasmanian-audit-of-surgical-mortality](http://www.racs.edu.au/racs/research-and-audit/audits-of-surgical-mortality/tasmanian-audit-of-surgical-mortality)).

**Dr Margaret Walker, FANZCA**

Coordinator  
Tasmanian Anaesthesia Mortality Audit

### South Australia

#### Overview

During the triennium 2006-2008 South Australia did not have an established anaesthetic mortality committee as the protective confidential legislation in South Australia had been lost. A new Health Care Act in 2008 created an opportunity for a new committee, which was declared in September 2010 and formed in 2011. Its role is to analyse adverse event information, specifically patient mortality, from health services related to anaesthesia with the objective of recommending quality improvement initiatives. To facilitate the reporting the anaesthetist's and surgeons reporting forms are now available to download on the SA ANZCA website at [www.sant.anzca.edu.au/mortality-reports](http://www.sant.anzca.edu.au/mortality-reports).

#### Composition of the South Australian Anaesthetic Mortality Committee (SAAMC)

Members of the committee consist of the following:

Three nominations each from:

- Australian and New Zealand College of Anaesthetists
- Australian Society of Anaesthetists

One nomination each from:

- South Australian Department of Health
- College of Intensive Care Medicine
- Royal Australasian College of Surgeons
- Australian College of Operating Room Nurses
- Royal Australian and New Zealand College of Obstetricians and Gynaecologists
- Rural practitioners

#### Meeting process

Since the establishment of the new committee, the committee has met three times. Only reports from 2007 onwards were available. Reports from 2007 and 2008 were not considered for this report.

#### Reporting

The SAAMC reports to the South Australian and Northern Territory Regional Committee of ANZCA, the Quality and Safety Committee and South Australian Health Safety and Quality Council. All reports, communication and/or advice given to these or any other persons/groups/bodies will not contain identifying information.

#### Professor W. John Russell

Chair  
South Australian Anaesthetic Mortality Committee

### Queensland, Australia

The Queensland Committee to Enquire into Perioperative Deaths (QCEPOD) was formed in 1975 and gazetted as an official committee of Queensland Health under the chairmanship of the Director-General of Health and Medical Services in 1976. There was continuous operation until 2005. In 2006, in response to the Bundaberg Hospital Commission of Enquiry and the Queensland Health Systems Review, the Queensland Parliament established the Health Quality and Complaints Commission (HQCC). The HQCC was tasked, among other things, with monitoring, reviewing and reporting on the quality of health services in Queensland. The responsibility for oversight of QCEPOD and the quality councils (paediatric and maternal councils) was transferred to the HQCC from Queensland Health as it was planned that HQCC would be looking at deaths in hospital as part of its quality agenda. The QCEPOD data was transferred to HQCC. The HQCC as part of its setting up process reviewed the activities of the bodies it had been given responsibility for to see how they would fit into its remit.

In late 2007 the commission brought down a determination that it would not be able to continue the activities of QCEPOD. The review recommended the "establishment of a specialty advisory committee to review aggregated recommendations arising from mortality reviews and RCAs".

#### Current developments (2009/2011)

Queensland Health has approved the re-establishment of a state anaesthetic mortality review committee. This is as a result of the hard work of Dr Annette Turley, Co Clinical Chair of the Statewide Anaesthetic and Perioperative Care Clinical Network (SWAPNET), to whom we are all very grateful. The new committee will be called the Queensland Perioperative and Periprocedural Anaesthetic Mortality Review Committee (QPPAMRC). The terms of reference will be similar to the previous Queensland committee to enquire into perioperative deaths. The intent of the committee is to look at all areas where anaesthesia and procedural sedation occur. The time period for capture of deaths has been extended to 30 days post anaesthesia. Reporting to the committee will still be voluntary, but a new process involving capture of hospital mortality information will give more reliable data than previously. The formal terms of reference have not been included as they are still being finalised. Work is underway (October 2010) to set up the mechanics and support structure for the committee. I have been asked to act as the interim chair and have accepted. The committee plans to start receiving and assessing reports at the start of 2012.

#### Dr James Troup

Chair  
Queensland Perioperative and Periprocedural Anaesthetic Mortality Review Committee

### Australian Capital Territory

#### Overview

The ANZCA Australian Capital Territory (ACT) Regional Committee has been working for over nine years to establish an Anaesthetic Mortality and Morbidity Committee. Although we are disappointed that this has still not been achieved, the committee has recently decided to take a different approach. However, there was no committee during the reporting period and subsequently no data were submitted for this triennial report.

#### Current Developments

The ACT regional committee has accepted an offer from ACT Audit of Surgical Mortality (ACTASM) to join them. An anaesthetic representative would be included as part of the ACTASM process. The full details are still to be worked out and although there may be deficits it is hoped that with time, these will be addressed.

#### Dr Carmel McInerney

Chair  
ACT Regional Committee

### New Zealand

#### Overview

The New Zealand Perioperative Mortality Review Committee was established in 2010 under the NZ Public Health and Disability Act (NZPHDA) 2000 and reports to the Health Quality and Safety Commission alongside the already established mortality review committees; that is the Perinatal and Maternal, the Family Violence, and the Child Mortality Review Committees. The inaugural report was published in February 2012. [www.hqsc.govt.nz/assets/POMRC/POMRC-2011-Report.pdf](http://www.hqsc.govt.nz/assets/POMRC/POMRC-2011-Report.pdf)

#### Terms of reference

The committee is required to:

1. Review and report to the Health Quality and Safety Commission on deaths that are within the committee's scope, with a view to reducing these deaths and to continuous quality improvement through the promotion of on-going quality assurance programs.
2. Advise on any other matters related to mortality
3. Develop strategic plans and methodologies that are designed to reduce morbidity and mortality and are relevant to the committee's functions.

#### Deaths to be reported

1. Deaths that occurred after an operative procedure:
  - a. Within 30 days.
  - b. After 30 days but before discharge from hospital.
2. A death that occurred whilst under the care of a surgeon in hospital even though an operation was not undertaken.

Noting that:

3. An operative procedure is defined as any procedure that requires anaesthesia (local, regional or general) or sedation.
4. Gastroscopies, colonoscopies, and cardiac or vascular angiographic procedures (diagnostic or therapeutic) carried out in designated endoscopy or radiological rooms would be included in this definition.

#### Confidentiality

The provisions relating to confidentiality are contained in Schedule 5 of the NZPHDA 2000, and place strict limits on disclosure of information. Anyone who discloses information illegally faces a fine of up to \$10,000 and if a registered health practitioner, disciplinary action.

### Coroners Act (relevant sections)

#### (1) The purpose of this Act is to help to prevent deaths and to promote justice through—

- (a) investigations, and the identification of the causes and circumstances, of sudden or unexplained deaths, or deaths in special circumstances; and
- (b) the making of specified recommendations or comments (as defined in section 9) that, if drawn to public attention, may reduce the chances of the occurrence of other deaths in circumstances similar to those in which those deaths occurred.

#### (13) Deaths that must be reported under section 14(2)

- (1) This section applies to the following deaths if, and only if, they are deaths to which subsection (2) applies:
  - During medical, surgical, or dental operation, treatment, etc
- (c) every death—
  - (i) that occurred while the person concerned was undergoing a medical, surgical, dental, or similar operation or procedure; or
  - (ii) that appears to have been the result of an operation or procedure of that kind; or
  - (iii) that appears to have been the result of medical, surgical, dental, or similar treatment received by that person; or
  - (iv) that occurred while that person was affected by an anaesthetic; or
  - (v) that appears to have been the result of the administration to that person of an anaesthetic or a medicine (as defined in section 3 of the Medicines Act 1981):
- (d) any death that occurred while the woman concerned was giving birth, or that appears to have been a result of that woman being pregnant or giving birth:

### The future

The inaugural report will contain questions for consultation with all stakeholders on the next steps for POMRC.

### Dr Leona Wilson

Chair  
Perioperative Mortality Review Committee

## References

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# Appendices

## Appendix 1: Glossary Of Terms – Case Classification

### Deaths Attributable to Anaesthesia

Category 1	Where it is reasonably certain that death was caused by the anaesthesia or other factors under the control of the anaesthetist.
Category 2	Where there is some doubt whether death was entirely attributable to the anaesthesia or other factors under the control of the anaesthetist.
Category 3	Where it is reasonably certain that death was caused by both surgical and anaesthesia factors.

### 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. 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 anaesthetists is identified which could or should have been done better subcategory G should also be applied.

### Deaths In Which Anaesthesia Played No Part

Category 4	Surgical death where the administration of the anaesthesia is not contributory and surgical or other factors are implicated.
Category 5	Inevitable death which would have occurred irrespective of anaesthesia or surgical procedures.
Category 6	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.

### Unassessable Deaths

Category 7	Those that cannot be assessed despite considerable data but where the information is conflicting or key data is missing.
Category 8	Cases which cannot be assessed because of inadequate data.

### Casual or contributory factors in category a death

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

### Subcategories

#### A. Preoperative

(i) Assessment	This may involve failure to take an adequate history or perform an adequate examination or to undertake 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 contraindicated 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 (for example, bypass).
(iv) Circulatory Support	Failure to provide adequate support where there is haemodynamic instability, in particular in relation to techniques involving sympathetic blockade.

## Appendices continued

### C. Anaesthesia Drugs

(i) Selection	Administration of a wrong drug or one which is contraindicated 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 in 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 tranquillising agents where reversal was 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 Monitoring	Failure to observe minimum standards as enunciated in the ANZCA Professional Documents or to undertake additional monitoring when indicated for example, 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. Postoperative

(i) Management	Death as a result of inappropriate intervention or omission of active intervention by the anaesthetist or a person under their direction (for example, 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 adequacy of supervision of a trainee is based on the ANZCA Professional Document on supervision of trainees.
(ii) Poor Organization 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.

# Acknowledgements

The ANZCA Mortality Subcommittee wishes to thank the members of all state mortality committees that provided data and information for this report. The subcommittee would also like to thank those involved in other mortality or regional committees that provided updates on their activities. These thanks extend to the support staff of these committees.

The subcommittee would like to thank the Australian Bureau of Statistics and the Australian Institute of Health and Welfare for providing data.

Special thanks go to Giselle Collins, ANZCA Quality and Safety Officer, for her assistance in preparing this report.

The presentation of this report is based on a template used in the 2003-2005 report, which was designed to a large extent by Pauline Berryman, the previous ANZCA Quality and Safety Officer.

