

# SCIDUA

Special Committee Investigating  
Deaths Under Anaesthesia

2017 Special Report



CLINICAL  
EXCELLENCE  
COMMISSION

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**ACTIVITIES OF THE  
SPECIAL COMMITTEE  
INVESTIGATING DEATHS  
UNDER ANAESTHESIA, 2017**

**Special Report**



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## Foreword

The Special Committee Investigating Deaths Under Anaesthesia (SCIDUA) has been reviewing deaths associated with anaesthesia (and including sedation, more recently) since 1960. This review process has been substantially unaltered over this time. Thus the reports and journal publications from SCIDUA provide an unparalleled world review of the improvement in anaesthetic care which has occurred. The reports from SCIDUA also provide reassurance to the public of the safety of anaesthesia and sedation in our region. The major reason for the existence of SCIDUA is, however, to report back to medical practitioners advising them of any correctable aspects of the practice of anaesthesia and sedation, so that such necessary improvements are implemented in anaesthetic care. It is this activity that is predominantly responsible for the improvements occurring.

This 2017 Report again reflects the continuing improvement in anaesthetic care, as it notes the percentage of anaesthetic-related deaths with correctable factors has fallen to its lowest level of 27% of an ever decreasing number of deaths which have some anaesthetic element contributing to the death.

It should be noted that in 2017 Professor Ross Holland died. Professor Holland, as a young trainee in the late 1950s, was instrumental in the inauguration of SCIDUA and then served as a member of SCIDUA for over 50 years. He was passionate about improving anaesthetic safety and patient care, and his legacy lives on strongly in SCIDUA to serve the anaesthetic interests of patients in NSW and, more widely, Australia and the world.

This Report also marks the final report from Dr David Pickford, current Chair of SCIDUA. Dr Pickford completes 25 years membership of SCIDUA during which time he has acted as Assistant Secretary (1993-1999), Secretary (2000-2009) and Chair since 2010. It is the work of such dedicated reviewers that allows SCIDUA to continue to set the standard for review of anaesthetic-related mortality, and to continue to improve the anaesthetic care (including sedation) administered to patients in NSW.

**AB Baker AM**  
Emeritus Professor  
University of Sydney

## **SCIDUA membership, 2017**

Dr David Pickford, Chair

Dr Michele O'Brien, Deputy Chair & Medical Secretary

Dr Damien Boyd

Dr Matthew Crawford

Dr Carl D'Souza

Ms Carrie Marr (Ex-officio)

Dr Elizabeth O'Hare

Dr Benjamin Olesnicky

Dr Frances Smith

# Executive Summary

The Special Committee Investigating Deaths Under Anaesthesia (SCIDUA) has been reviewing anaesthesia-related deaths since 1960. Because sedation and anaesthesia exist on a continuum of a decreased level of consciousness and use the same or similar drugs, the Committee also reviews sedation-related deaths in NSW.

In NSW, the mandatory requirement to notify a death arising after anaesthesia or sedation, for an operation or a procedure, is stipulated in section 84 of the *Public Health Act 2010*. We currently do not have available a method to verify whether all anaesthesia and/or sedation deaths are reported under that provision, but we have an ongoing commitment to remind and encourage medical practitioners to report these deaths. The Committee is confident that the data contains a representative sample of deaths in NSW. Other reporting sources within the Clinical Excellence Commission (CEC) have helped ensure that major cases are not missed. Our data also indicates a good response rate from health practitioners in providing further details of their notified cases, with 86 per cent of questionnaires requested in 2017 completed and returned to the Committee.

In 2017 the Committee reviewed 500 cases where death had occurred during, due to, or within 24 hours of, an anaesthetic or administration of sedative drugs for medical procedures. Of these, 388 fell within the terms of reference of the Committee and were then classified.

In 48 cases the death was wholly or partly related to anaesthetic factors. A summary follows:

- Anaesthesia either directly caused, or substantially contributed to, the patient's death in 6 cases (Category 1 and 2<sup>1</sup>)
- Anaesthesia and surgical factors contributed to the patient's death in the remaining 42 cases
- Most of the patients were elderly, with 87.5 per cent (n=42) older than 65 years and 58 per cent (n=28) older than 80 years
- More than half of the deaths (58%, n=28) were ASA<sup>2</sup> grade 4 and 5, i.e., critically unwell. Nearly all cases (98%, n=47) were ASA grade 3, 4 and 5 i.e., had significant or life-threatening co-morbidities<sup>3</sup>
- Notably, in 73 per cent (n=35) of cases, no correctable anaesthetic factor could be identified. Undergoing surgery still poses a risk to patients despite advances in anaesthetic drugs, monitoring and techniques

Correctable anaesthetic factors were seen in 27 per cent (n=13) of cases. The most common factors were:

- Inappropriate drug dosage (65%)
- Inadequate pre-operative assessment (31%)
- Poor planning (31%)
- Inadequate airway maintenance (23%).

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<sup>1</sup>Classification of Anaesthetic Mortality (see Appendix C).

<sup>2</sup>The American Society of Anesthesiologists (ASA) physical status rating grades patients according to their health (see Appendix D).

<sup>3</sup>Co-morbidities are disease processes that occur at the same time and may impact on each other.

These findings should be viewed in light of the retrospective nature of the Committee's deliberations.

In May 2017, the average estimated resident population in NSW, as reported by the Australian Bureau of Statistics, was about 7.89 million<sup>4</sup>. Using this figure, the estimated anaesthesia-related mortality rate was approximately six deaths per million population per annum. The estimated mortality directly caused by the anaesthetic was 0.8 deaths per million population per annum.

There were approximately 1.32 million individual episodes of anaesthesia care recorded at all public and private hospitals in NSW during 2017<sup>5</sup>. Using this figure, the estimated anaesthesia-related mortality was 1:27,500 procedures and the estimated mortality directly caused by anaesthesia was 1:220,000 procedures.

The Committee reviews anaesthetic deaths to look for management choices that it considers could be improved. These are called correctable anaesthetic factors. The estimated mortality of anaesthetic deaths with correctable factors for 2017 was 1:102,000 procedures.

The vast majority of patients who die with anaesthetic-related factors are elderly and frail, and/or have a significant life-threatening illness. The Committee views these as not unexpected deaths, but the current classification does not highlight this fact. It is worth noting that the NSW Coroner's Act 2009 actually only reviews medical deaths where they are "not the reasonably expected outcome of a health-related procedure". Nevertheless, the Committee feels it is necessary to continue reviewing all deaths to increase our understanding of the interaction of anaesthesia with illness and to assess what improvements can be made in the delivery of health care in NSW.

It is increasingly rare to review a case where a previously healthy patient dies from anaesthesia administration. When this does occur, the Committee, and indeed the Coroner, reviews the case to understand why this has happened in an effort to prevent this happening in the future.

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<sup>4</sup> Australian Bureau of Statistics, 2016, *Australian Demographic Statistics*, 'Table 4. Estimated Resident Population, States and Territories (Number)', time series spreadsheet, cat. no. 3101.0, viewed 23 April 2018, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3101.0Jun%202015?OpenDocument>.

<sup>5</sup> This figure was obtained from the Performance Analysis and Reporting Branch, NSW Ministry of Health. It included cerebral anaesthesia, conduction anaesthesia and analgesia and anaesthesia during labour and delivery procedure. A coding hierarchy was used to ensure that only one anaesthesia item number was counted per episode of anaesthesia care.

## 1. SCIDUA

The Special Committee Investigating Deaths Under Anaesthesia (SCIDUA) is an expert committee appointed by the Minister for Health and has been in operation since 1960. Its current terms of reference are:

*'to subject all deaths which occur while under, as a result of, or within 24 hours after, the administration of anaesthesia or sedation for procedures of a medical, surgical, dental or investigative nature to peer review so as to identify any area of clinical management where alternative methods could have led to a more favourable result'*

The Minister appoints members to the Committee for a fixed term of five years. The Minister may also appoint a member who is a representative of the Ministry of Health or the Clinical Excellence Commission. The Committee elects its own chairperson, who must be a currently practising anaesthetist.

The Committee has anaesthetists from a broad range of clinical specialties and professional organisations. Nominations for membership come from the Australian and New Zealand College of Anaesthetists (ANZCA), the Australian Society of Anaesthetists and academic departments of anaesthesia.

## 2. Reporting deaths to SCIDUA

The notification of deaths arising after anaesthesia or sedation for operations or procedures is a mandatory requirement in NSW, regardless of whether it is a Coroner's case or not. This causes some confusion because until 2009 reporting was stipulated within the *Coroner's Act 1980*.

Reporting to SCIDUA is required under section 84 of the *Public Health Act 2010* and applies:

*'if a patient or former patient dies while under, or as a result of, or within 24 hours after, the administration of an anaesthetic or a sedative drug administered in the course of a medical, surgical or dental operation or procedure or other health operation or procedure (other than a local anaesthetic or sedative drug administered solely for the purpose of facilitating a procedure for resuscitation from apparent or impending death).'*

Health practitioners are required to notify the death by completing the State Form (SMR010.511): *Report of death associated with anaesthesia/sedation* (Appendix A). This can be ordered online from Stream Solutions ([www.tollstreamdirect.com](http://www.tollstreamdirect.com)).

It can also be downloaded at [www.cec.health.nsw.gov.au](http://www.cec.health.nsw.gov.au).

Cases may also be referred to SCIDUA by the Patient Safety Team at the CEC, and the Collaborating Hospitals' Audit of Surgical Mortality (CHASM) Committee, if there is concern that anaesthesia may have been a factor in a patient's death.

### 3. Legislative protection and confidentiality

SCIDUA has special privilege under section 23 of the Health Administration Act 1982 (NSW). This legislation makes it an offence for a person who obtains information in connection with the work of the Committee to:

- disclose the information
- answer any questions or produce any documents relating to the information in any proceedings.

Confidentiality of all communications between the reporting anaesthetist and the Committee is paramount. Information can only be released with the consent of the person who provided the information, or the approval of the NSW Minister for Health.

### 4. Reporting

SCIDUA communicates with its key stakeholders as follows:

- Each individual anaesthetist who provides information to the Committee receives a letter from the chairperson explaining the reasons behind the Committee's views on his or her case
- A special report for the preceding calendar year is provided to the Minister
- The Committee provides data to the ANZCA Mortality Sub-committee, which produces the triennial report of 'Safety of Anaesthesia: A review of anaesthesia-related mortality reporting in Australia and New Zealand'
- Periodically, the Committee submits reports to peer-reviewed journals, in which trends in anaesthesia-related mortality are described. These reach a wide range of anaesthetists in Australia, New Zealand and internationally.

### 5. Why this is important

Anaesthesia is not a medical therapy in itself, but is performed so that a medical or surgical procedure can be performed. Ideally, there would be no adverse outcomes from the anaesthetic. Unfortunately, all current anaesthetic and sedative drugs are either cardiovascular and/or respiratory depressants and their administration is subject to human error. Additionally, the specialised equipment and monitors that are used may be subject to faults and/or incorrect use.

Anaesthetists monitor, interpret and react to changes in the patient's condition. These changes could be due to the underlying disease process, the patient's intercurrent diseases, interactions or reactions to drugs, or due to the surgical/medical procedure taking place and its complications.

It is important to look for emerging trends, because anaesthetic, surgical and medical interventions change with time. It is also important to monitor anaesthetic outcomes and look for ways to reduce any adverse events.

## 6. Process

All reported deaths are reviewed by the triage sub-committee which can either classify the death as due to factors not falling under the control of the health practitioner, or request further information from the reporting health practitioner using an additional SCIDUA questionnaire (see Appendix B).

The questionnaire is always sent if there is any suspicion that the anaesthetic or sedation was involved, or if the patient died during the procedure or in the recovery period. A questionnaire is also sent when there is a paucity of information on the initial notification form. The medical practitioner may wish to make further confidential information available to the Committee that was not available in the patient's medical record.

When questionnaires are returned, all information is de-identified and distributed to members of the Committee prior to its meetings for review. Cases are discussed at each meeting and classified. A confidential reply by the Chair is sent to the health practitioner explaining the Committee's decision.

The Committee manages its data in a secure Microsoft Access 2010/SQL server relational database. It stores data on patients and anaesthetists, as well as that collected from the form of notification, questionnaire and triage sub-committee and committee meetings. The SCIDUA's data analyst is responsible for data management, ensuring accurate reporting, interpretation and verification of anaesthesia-related death data.

## 7. System of classification

Cases are classified using a system agreed upon by the ANZCA Anaesthesia Mortality Sub-committee in 2006. The full system of classification may be seen in Appendix C at the end of this report.

Group A contains deaths where anaesthetic factors are thought to have played a role. There are three categories:

- Category 1 - deaths primarily due to anaesthetic factors
- Category 2 - deaths where anaesthetic factors may have played some role
- Category 3 - deaths where both surgery and anaesthetic factors were thought to have contributed.

Group B contains deaths where anaesthesia is thought to have played no part. There are three categories:

- Category 4 - surgical deaths
- Category 5 - inevitable deaths (with or without surgery)
- Category 6 - incidental deaths, where the cause was unrelated to the surgery or anaesthetic.

Group C contains deaths where the factors involved in the patient's death are not fully assessable. There are two categories:

- Category 7 is used when the committee has considerable data, but is unable to find out the actual cause of death
- Category 8 is used for cases in which the available data is inadequate.

The Committee agrees that this classification system has its limitations. In many cases the patient's disease or condition is the main contributing factor to the patient's death, as proceduralists now operate on older and sicker patients. For some deaths the surgical intervention may be the precipitating factor that leads to the death, but it is often difficult to dissociate the effects of the anaesthetic and the anaesthetist's response to the critical incident as contributing factors. This has led to many cases being classified as Category 3GH (the anaesthetic, surgery and

significantly the patient's own serious medical condition were factors that contributed to the death, but the Committee was satisfied with the anaesthetic and surgical management).

Surgical risk calculators have now evolved that allow the proceduralist and anaesthetist to discuss the level of risk with the patient and their family. The Committee does not currently have the required level of detailed information to use these calculators in the assessment of each case.

## 8. Results

### 8.1 Committee activities

**Table 1: Cases reviewed and classified by SCIDUA in 2017**

Meeting no.	Reviewed	Classified	More information
518	14	14	-
519	12	12	-
520	11	8	2
521	12	12	-
522	14	13	-
523	13	13	-
524	12	11	1

\* The number of cases reviewed by the committee include some that were excluded because they did not fall within the terms of reference.

**Table 2: Cases reviewed and classified by triage sub-committee in 2017**

Triage no.	Reviewed	Classified	More information
123	44**	28	12
124	40**	24	14
125	66**	45	14
126	73**	59	12
127	55**	40	11
128	86**	67	8
129	48	42***	6

\*\* The number of cases reviewed by the triage sub-committee include some that were excluded because they did not fall within the terms of reference and those referred to the committee directly from triage.

\*\*\* A previously classified case was reclassified

**Table 3: Summary of committee activities in 2017**

	<b>No. of cases</b>
Reviewed by triage	412
Reviewed by the committee	88
<b>Total cases reviewed</b>	<b>500</b>
Classified by triage	304
Classified by the committee	84
<b>Total cases classified</b>	<b>388</b>

The Committee met seven times in 2017 and, together with the triage sub-committee, reviewed 500 cases. As has been noted in some past reports, not all deaths occurred in the reporting year, but are reviewed as soon as possible after the information was made available to the Committee. Therefore, in the majority of cases, the deaths occurred for the reporting year and the preceding year.

Some cases do not fall within the terms of reference – usually because the patient died more than 24 hours after the operation and anaesthesia was not thought to be implicated in any way. This may be because the doses of drugs used were trivial or given during resuscitation efforts. These are excluded from further study. In total, 388 cases were classified using the system described above.

## 8.2 Committee findings

**Table 4: Classification of cases reviewed in 2017**

<b>Death Type</b>	<b>Category</b>	<b>No. of Cases</b>
Deaths attributable to anaesthesia	1 & 2*	6
	3	42
	4	27
Deaths in which anaesthesia played no part	5	288
	6	12
	7 & 8*	13
Un-assessable deaths	<b>Total</b>	<b>388</b>

\* Aggregated data is reported, due to small numbers in at least one of the categories (n≤5)

## 8.3 Anaesthesia-related deaths

The cases of greatest interest to the Committee are those where anaesthetic factors are thought to be the main contribution to the death (Categories 1 and 2), “primary anaesthetic deaths”, and those where both anaesthetic and surgical factors are involved (Category 3). There were 48 anaesthesia-related deaths classified in 2017, with a list of identified factors shown in Table 5.

It is important to realise that there are two sub-sets of anaesthesia-related death - those in which the anaesthetic management could have been improved with possibly a better outcome, and those in which the Committee could not suggest any way in which alternative management could have averted the fatal outcome.

**Table 5: Factors identified in anaesthesia-related deaths, 2017 (n=48)**

<b>Causal or contributory factors</b>	<b>Frequency count</b>
<b>A Pre-operative</b>	
Ai Assessment	4
Aii Management	-
<b>B Anaesthetic technique</b>	
Bi Choice or application	-
Bii Airway maintenance	3
Biii Ventilation	2
Biv Circulatory support	1
<b>C Anaesthesia drugs</b>	
Ci Selection	-
Cii Dosage	5
Ciii Adverse event	1
Civ Inadequate reversal	1
Cv Incomplete recovery	-
<b>D Anaesthetic management</b>	
Di Crisis management	-
Dii Inadequate monitoring	2
Diii Equipment failure	-
Div Inadequate resuscitation	1
Dv Hypothermia	-
<b>E Post-operative</b>	
Ei Management	-
Eii Supervision	1
Eiii Inadequate resuscitation	1
<b>F Organisational</b>	
Fi Inadequate supervision or assistance	1
Fii Poor organisation	-
Fiii Poor planning	4
<b>G No correctable factor</b>	35
<b>H Medical condition of patient a significant factor</b>	46

The frequency counts add up to more than 48, because some anaesthesia-related deaths have more than one factor identified.

### **8.3.1 No correctable factor identified**

For thirty-five (73%) deaths attributable to anaesthesia, the Committee felt that anaesthetic, surgical and/or the patient's own serious medical condition were factors that contributed to the death. For these cases the Committee was satisfied with the anaesthetic management, but it is a reminder that surgery and anaesthesia are not without risk. It is encouraging to see such a high percentage of cases falling into this category, as it reassures us of the high level of care being delivered by anaesthetists in NSW.

### **8.3.2 Anaesthesia-related with correctable factors**

The Committee classified thirteen cases (27%) as having correctable factors in the anaesthetic management. For some deaths multiple factors were ascribed. The factors identified were:

- inappropriate drug dosage (n=5)
- inadequate pre-operative assessment (n=4)
- poor planning (n=4)
- inadequate airway maintenance (n=3)
- inadequate ventilation (n= 2)
- inadequate monitoring (n=2)
- inadequate anaesthetic management of resuscitation (n=1)
- inadequate circulatory support (n=1)
- adverse event (n=1)
- inadequate reversal (n=1)
- inadequate post-operative resuscitation (n=1)
- inadequate post-operative supervision (n=1)
- inadequate supervision or assistance (n=1).

#### ***8.3.2.1 Inappropriate drug dosage***

The Committee identified five cases where the dosage of anaesthetic/sedative drugs was considered a factor in the patient's death. Although the dose of drug used might frequently be an adequate and appropriate dose for other patients, the Committee considered that a dose-related event occurred. Pre-operative assessment of the patient's age and underlying medical condition needs to be considered to avoid over-dosage.

#### ***8.3.2.2 Inadequate pre-operative assessment***

The Committee identified four cases where inadequate pre-operative assessment was considered a factor in the patient's death. Better assessment pre-operatively may have led to the use of invasive monitoring and earlier detection of a critical event. In another case better pre-operative assessment may have led to a less invasive surgical management in a patient with multiple comorbidities.

#### ***8.3.2.3 Poor planning***

The Committee identified four cases where poor planning was considered a factor in the patient's death. There was one case where it was considered that with a known poor prognosis, consideration should have been given to transfer the patient to a hospital with higher level care (intensive care) in the peri-operative period. In another 3

cases the Committee felt that with better pre-operative discussion between the patient and patient's family, the proceduralist and anaesthetist may have changed the management approach.

#### **8.3.2.4 Inadequate airway maintenance**

The Committee identified three cases where adequacy of airway maintenance was considered a factor in the patient's death. In all three cases pulmonary aspiration occurred as a complication. In one case the event was unanticipated in a fasted patient.

#### **8.3.2.5 Inadequate ventilation**

The Committee identified two cases where there were problems with the ventilation technique. In one case a patient with serious co-morbidities was inadequately ventilated intra-operatively. This was not immediately detected due to the use of a high flow oxygen delivery system. In the other case the Committee felt that premature extubation led to difficulties.

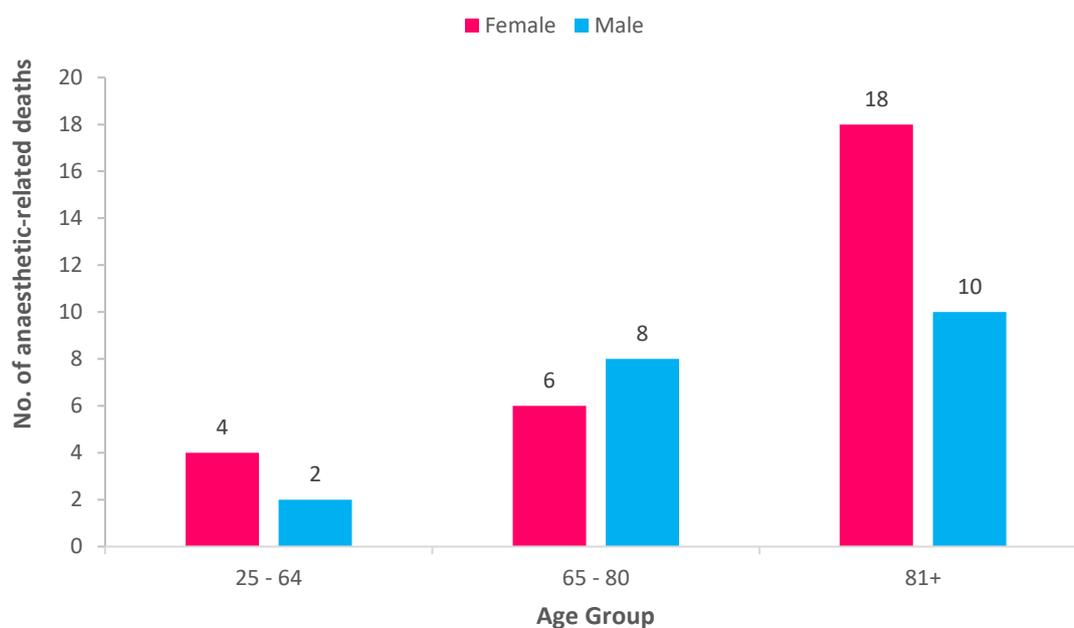
#### **8.3.2.6 Inadequate monitoring**

The Committee identified two cases where inadequate monitoring was considered a factor in the patient's death. Both patients had significant co-morbidities and earlier detection of cardiovascular instability may have led to increased or more timely efforts to manage the problem.

## 8.4 Description of anaesthesia-related deaths

### 8.4.1 Age and sex

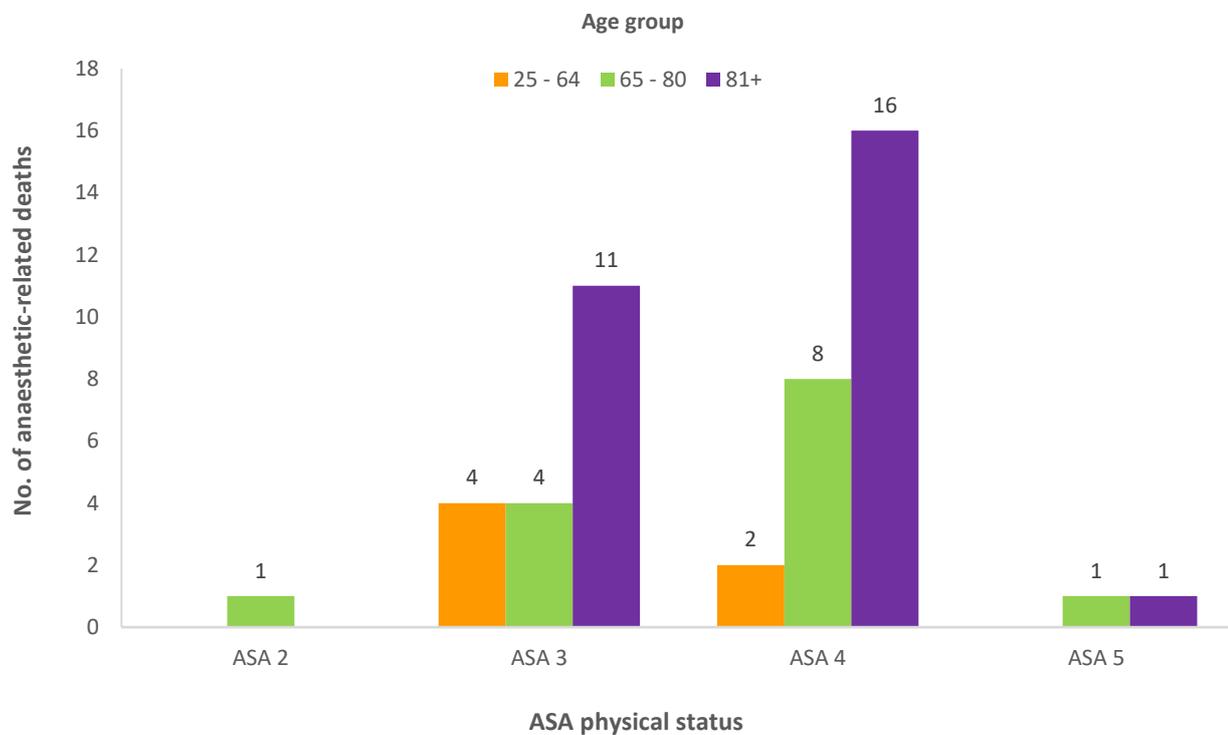
Figure 1: Age and sex distribution in anaesthesia-related deaths, 2017 (n=48)



- There were more females (58%) than males (42%) in anaesthesia-related deaths
- Most patients (87.5%, n=42) were aged 65 and over, with more than half aged over 80 (58%, n=28)
- The median age of patients was 84 years (range: 40 years – 96 years)

## 8.4.2 ASA physical status<sup>6</sup>

Figure 2: Age and ASA distribution in anaesthesia-related deaths, 2017 (n=48)



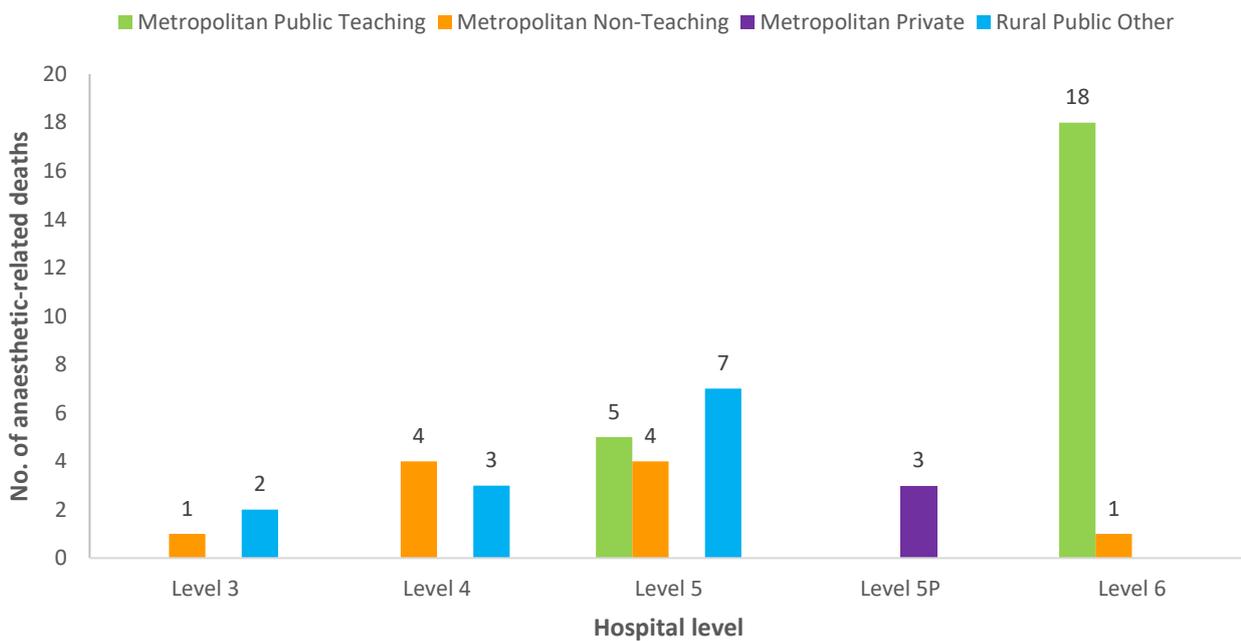
- Most anaesthesia-related deaths (98%, n=47) were ASA grade 3, 4 or 5. Twenty-eight patients were aged over 81 years, and all these patients were ASA grade 3, 4 or 5. Anaesthetists are frequently giving anaesthetics to very old and sick patients and anaesthesia poses a significant risk to this group
- The ASA 2 patient suffered an adverse reaction to the anaesthetic, but the committee was satisfied with the management of the case.

<sup>6</sup>The American Society of Anesthesiologists (ASA) Physical Status rating grades patients according to their health (see Appendix D).

### 8.4.3 Hospitals

SCIDUA classifies hospitals into six levels, using a numerical system (Appendix E) based on, but not identical to, the NSW Guide to Role Delineation of Health Services<sup>7</sup>. Figure 3 shows the distribution of anaesthesia-related deaths in NSW hospitals.

**Figure 3: Distribution of anaesthesia-related deaths by hospital type, 2017 (n=48)**

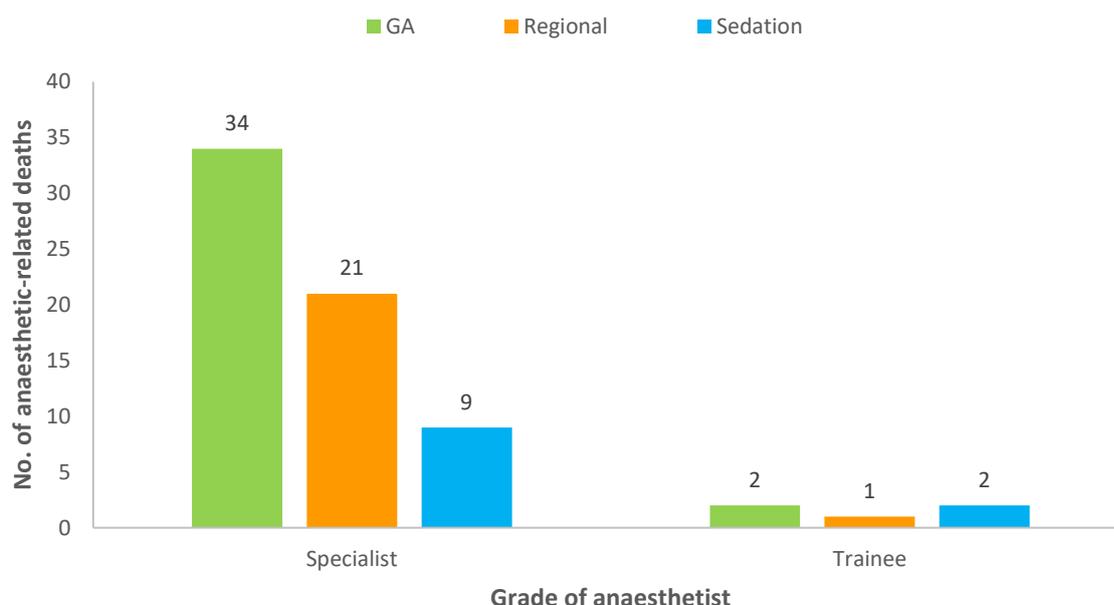


- The majority of anaesthesia-related deaths (48%, n=23) occurred in Level 5 or 6 metropolitan public teaching hospitals where higher volumes of complicated surgery are performed
- Twelve (25%) occurred in rural public hospitals
- Three (6%) occurred in metropolitan private hospitals
- Ten (21%) occurred in metropolitan public non-teaching hospitals
- Almost all deaths (n=18) in Level 5 hospitals were classified as having surgical and anaesthetic factors involved (Category 3).
- All deaths (n=19) at Level 6 hospitals occurred in ASA 3 or 4 patients (with moderate to severe co-morbidities) and in 17 of those (89%) deaths there were surgical and anaesthetic factors involved (Category 3).

<sup>7</sup>NSW Ministry of Health, 2016, Guide to the Role Delineation of Health Services, viewed 24/04/2018  
<http://www.health.nsw.gov.au/services/Publications/role-delineation-of-clinical-services.PDF>

#### 8.4.4 Anaesthetists and anaesthesia

Figure 4: Distribution of anaesthesia-related deaths by grade of anaesthetists and type of anaesthetics administered, 2017 (n=48)



- Most anaesthesia-related deaths (71%, n=34) had a general anaesthetic administered either by a specialist anaesthetist or by trainees with the close supervision of a specialist anaesthetist
- Twenty-one (44%) had a regional type of anaesthesia administered by a specialist anaesthetist
- Sedation was reported in eleven (23%) deaths. Nearly all (82%, n=9) were administered by specialist anaesthetists
- Trainee anaesthetists administered the anaesthesia/sedation in three (6%) of the anaesthesia-related deaths

#### 8.4.5 Surgery and urgency

SCIDUA classifies the timing of surgery as emergency, urgent, urgent non-emergency, and scheduled (refer to Appendix F for definitions). The Australian and New Zealand College of Anaesthetists (ANZCA) Mortality Subcommittee report into the "Safety of Anaesthesia in Australia" will now report urgency based on whether the patient was admitted for scheduled (elective) surgery or as an emergency admission.

The Committee found that, by far, the largest type represented was urgent non-emergency surgery. It accounted for most of the surgery performed in anaesthesia-related deaths (65%, n=31). Most of these cases were orthopaedic (74%, n=23).

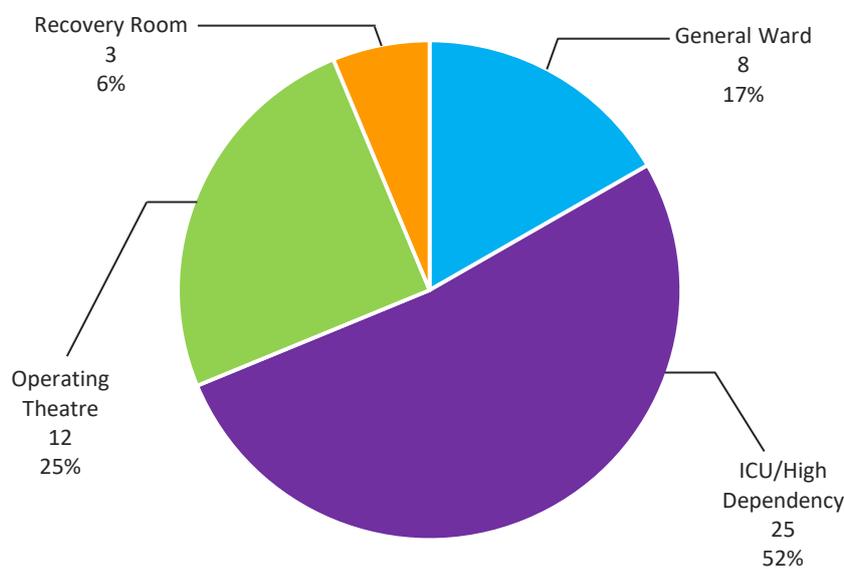
Scheduled surgery accounted for eleven (23%) of the cases performed in anaesthesia-related deaths. Some of these scheduled cases could have been emergency admissions to hospital, but the Committee was led to believe that the procedure was not critically time dependent and there was time for appropriate assessment and management before surgery.

Six (12.5%) of the operations classified as anaesthesia-related deaths were performed as an emergency.

Orthopaedic surgery was performed in more than half of all anaesthesia-related deaths (56%, n=27). Other types of surgery performed had small numbers and included non-invasive procedural, vascular operations, ENT / Head and Neck, abdominal, cardiothoracic and urological operations.

#### 8.4.6 Location of death

Figure 5: Distribution of anaesthesia-related deaths by location within the hospital, 2017 (n=48)



- Most anaesthesia-related deaths (52%, n=25) occurred in intensive care units (ICU) or high dependency units (HDU)
- There were twelve (25%) anaesthesia-related deaths in the operating theatre, followed by deaths in the general ward (17%, n=8) and the recovery room (6%, n=3)

## 8.5 Deaths in the operating theatre

Deaths that happen directly under the anaesthetist's care – on the operating table, or shortly after in the recovery room – can be particularly confronting. In 2017, the Committee reviewed seventy-two deaths that occurred in the operating theatre or procedural room. Of these, only twelve (17%) were classified as being anaesthesia-related (Table 6). The Committee also considered that death was inevitable and outside the control of the surgeon and anaesthetist in fifty-six (78%) deaths in the operating theatre or procedural room.

**Table 6: Classification of deaths in the operating theatre or procedural room by SCIDUA, 2017**

Death Type	Category	No. of cases
Deaths attributable to anaesthesia	1, 2 & 3	12
Deaths in which anaesthesia played no part	4 & 5	56
Un-assessable deaths	7 & 8	4
	<b>Total</b>	<b>72</b>

### 8.5.1 Anaesthesia-related deaths in the operating theatre

- The median age of “on table” anaesthesia-related deaths was 85.5 years (range: 68-96 years)
- Fifty-eight per cent (n=7) were ASA 4, i.e., critically unwell and one death (8.3%) occurred in a patient who was ASA 5. The rest were ASA 2 or 3, i.e., with mild or moderate systemic disease
- Orthopaedic surgery was performed in more than 58% of these cases (n=7). The remainder underwent cardiothoracic, ENT and non-invasive endoscopic procedures
- The majority of cases were urgent non-emergency (n=7, 58%), the remainder were scheduled operations (n=5, 42%)

## 8.6 Deaths associated with cemented hip arthroplasty

There were 16 cases where the Committee considered the cause of death was related to bone cement and 15 of those deaths were classified as anaesthesia/sedation related, but with no correctable anaesthetic factors. The Committee did not have enough information to fully classify the other case. There were other cases where bone cement might have been used, but the Committee agreed that the factors involved in those deaths were not typical bone cement implantation syndrome.

The majority of these patients (n=9, 56%) died in the operating room/recovery room. The urgency of these operations were classified as urgent non-emergency and one scheduled.

## 8.7 Deaths associated with haemorrhage

There were nine cases where death was thought to be due to uncontrolled haemorrhage as a complication of the patient's disease process and the surgery. The Committee was satisfied with the anaesthetic management in every case.

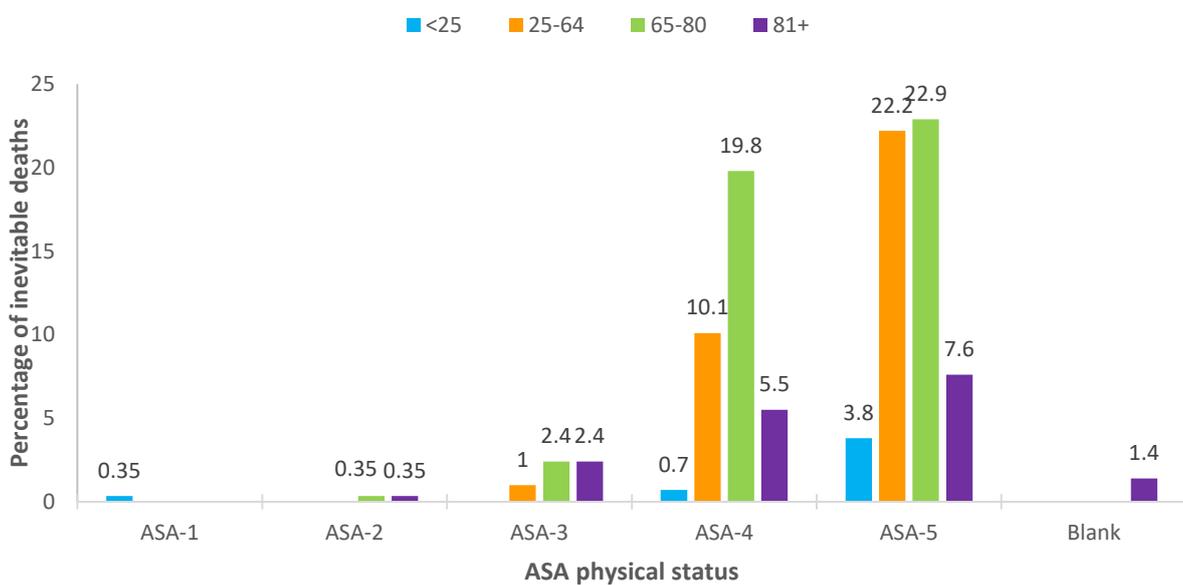
## 8.8 Inevitable deaths

The majority of cases (74%, n=288) reported to the Committee in 2017 were classified as having no anaesthetic or surgical factors involved and are considered inevitable deaths (Category 5). These were cases where the patient's disease or injury made recovery impossible, despite competent anaesthesia and surgery. The age and ASA grade<sup>8</sup> distribution among these inevitable deaths are presented in Figure 6.

Trauma was reported in thirty (10%) of these cases. Most inevitable deaths occurred after an operation or medical procedure listed as follows:

- Abdominal (34%, n=97)
- Neurosurgery (10%, n=29)
- Cardiothoracic (10%, n=28)
- Non-invasive procedure - Cardiac (10%, n=28)
- Vascular (10%, n=28)
- Non-invasive procedure - Endoscopy (9%, n=27)
- Other<sup>9</sup> (18%, n=51).

**Figure 6: Distribution of age and ASA physical status in inevitable deaths, 2017 (n=288)**



- Nearly all inevitable deaths (92%, n=264) were ASA grade 4 or 5, i.e., critically unwell, or not expected to survive for 24 hours
- Most were patients aged 65 or over (62%, n=178)

<sup>8</sup> The American Society of Anesthesiologists (ASA) Physical Status rating grades patients according to their health (see Appendix D).

<sup>9</sup> Includes radiological procedures, multi-trauma, general (non-abdominal), resuscitation, orthopaedic and urological surgery.

## **8.9 Futile cases**

These are cases where surgery is performed, when it is clear before starting, that no favourable outcome could be expected from the surgical intervention. The Committee classified 14 such cases in 2017.

While it is understandably difficult to be put in a situation where medical practitioners are seen to be withholding treatment, the concepts of what is of benefit to the patient and what is and is not a medically appropriate procedure should be considered in cases where time allows. Surgery in futile circumstances denies the patient good palliative care and may be an injustice.

## **8.10 Deaths not able to be assessed**

There were 13 cases classified Categories 7 and 8. It is important to note that both these categories could have anaesthetic factors involved in the patient's death, but the Committee has been unable to assess them, usually due to a lack of information.

# APPENDICES



# Appendix A | SCIDUA Notification Form

 SMR010511			FAMILY NAME		MRN	
	Facility:		GIVEN NAME		<input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	
	<b>REPORT OF DEATH ASSOCIATED WITH ANAESTHESIA/SEDATION (PREVIOUSLY FORM B)</b>		D.O.B. ____/____/____		M.O.	
			ADDRESS			
			LOCATION			
			COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE			
	LOCATION OF DEATH (eg, OR, ICU, HDU etc)		DATE OF DEATH	TIME OF DEATH	WEIGHT	
	Pre-operative diagnosis / condition					
	ASA classification (please tick) <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> E					
	Operation(s) / procedure(s)					
Findings at operation/procedure						
Induction		DATE OF INDUCTION	TIME OF INDUCTION	TIME ANAESTHETIC CEASED		
Anaesthetic / Sedation (tick all relevant boxes) <input type="checkbox"/> GA <input type="checkbox"/> Regional <input type="checkbox"/> Local <input type="checkbox"/> Sedation						
List of all drugs given & doses (including premedication if any)						
Brief description of events						
Likely cause(s) of death						
Anaesthetist / Sedationist (Please print name, title and qualifications)		1. _____				
		2. _____				
Contact details of Medical Officer completing this report (for feedback)		PRIVATE MAILING ADDRESS		HOSPITAL ADDRESS		
Name of Medical Officer completing this report:		SIGNATURE		DATE		
Please send completed form to: Secretary NSW Health, c/o Special Committee Investigating Deaths Under Anaesthesia Clinical Excellence Commission, Locked Bag 8 HAYMARKET NSW 1240 SPECIAL COMMITTEE INVESTIGATING DEATHS UNDER ANAESTHESIA						

REPORT OF DEATH ASSOCIATED WITH ANAESTHESIA/SEDATION (PREVIOUSLY FORM B)

SMR010511

Holes Punched as per AS2828.1: 2012  
BINDING MARGIN - NO WRITING

NH601685 301014

## Appendix B | SCIDUA Questionnaire

### SPECIAL COMMITTEE INVESTIGATING DEATHS UNDER ANAESTHESIA PRIVATE & CONFIDENTIAL REPORT

*This document is designed for the purposes of SCIDUA and the information collected is privileged under Section 23 of the NSW Health Administration Act 1982*

#### Case Record of Death in Association with Sedation and/or Anaesthesia

Reporting cases to regional or national anaesthesia mortality committees qualifies for two (2) credit points per hour with the ANZCA Continuing Professional Development program.

PLEASE RETURN THIS FORM TO:

THE SECRETARY – SCIDUA  
Locked Bag 8  
HAYMARKET NSW 1240

Case Number <i>(office use only)</i>	Hospital & Location <i>(eg. ICU; Theatre; Recovery; Ward)</i>		Date & Time of Death	
Name of Patient		Age	Sex	Weight
Name of Anaesthetist/Sedationist	Qualifications	Appointment	Name & Status of other Anaesthetists present	
Pre-operative diagnosis				
Condition(s) found at operation				
Operation proposed				
Operation(s) carried out				
Pre-anaesthetic assessment 1. Relevant history 2. Clinical findings 3. Relevant investigations				
		ASA <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> E		
Pre-anaesthetic preparation including: 1. Blood or fluids given pre-operatively and over what period 2. Pre-medication if any 3. Any other measures				

PLEASE SEE OVER



## Appendix C | Anaesthesia Mortality

### GLOSSARY OF TERMS – CASE CLASSIFICATION

#### A Deaths attributable to anaesthesia

<b>Category 1</b>	Where it is reasonably certain that death was caused by the anaesthesia or other factors under the control of the anaesthetist.
<b>Category 2</b>	Where there is some doubt whether death was entirely attributable to the anaesthesia, or other factors under the control of the anaesthetist.
<b>Category 3</b>	Where death was caused by both surgical and anaesthesia factors.
<p><b>Explanatory notes:</b></p> <ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>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, <u>sub-category H</u> should also be applied.</i></li> <li>• <i>If no factor under the control of the anaesthetist is identified which could or should have been done better, <u>sub-category G</u> should also be applied.</i></li> </ul>	

#### B Deaths in which anaesthesia played no part

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

#### C Un-assessable deaths

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

## CAUSAL OR CONTRIBUTORY FACTORS IN CATEGORY A DEATHS

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

### SUB-CATEGORIES

#### **A Pre-operative**

<b>(i)</b> 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.
<b>(ii)</b> 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**

<b>(i)</b> 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.
<b>(ii)</b> 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.
<b>(iii)</b> Ventilation	Death is caused by failure of ventilation of the lungs for any reason. This would include inadequate ventilator settings and failure to re-institute proper respiratory support after deliberate hypoventilation (e.g., bypass).
<b>(iv)</b> Circulatory Support	Failure to provide adequate support where there is haemodynamic instability, in particular in relation to techniques involving sympathetic blockade.

#### **C Anaesthesia drugs**

<b>(i)</b> Selection	Administration of a wrong drug or one which is contra-indicated or inappropriate. This would include 'syringe swap' errors.
<b>(ii)</b> 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.
<b>(iii)</b> 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.
<b>(iv)</b> Inadequate Reversal	This would include relaxant, narcotic and tranquilising agents where reversal is indicated.
<b>(v)</b> Incomplete Recovery	For example, 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, 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 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 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.

## Appendix D | American Society of Anesthesiologists Physical Status Classification

### **P-1**

A normal healthy 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

## Appendix E | Hospital Level

The nomenclature is a numerical system based on, but not identical with, the NSW Guide to Role Delineation of Hospitals. It classifies hospitals as follows:

- Level 6:** A multi-disciplinary hospital, which provides facilities for most or all surgical sub-specialties and the intensive care environment to support them. Specialist and sub-specialist anaesthetic staff are on site during the day and anaesthetic registrar cover is on site 24 hours a day. This classification also applies to where a hospital is designated as a trauma centre.
- Level 5:** A hospital which is multi-disciplinary, but only provides some sub-specialty surgery and anaesthesia, with an appropriate post-operative environment. Specialist and sub-specialist anaesthetic staff are on site during the day and anaesthetic registrar cover is on site 24 hours a day, or available within 10 minutes.
- Level 4:** A multi-disciplinary hospital, which does not cater for all surgical specialities, but accepts some trauma and provides a lower level of intensive care, referring any patients in need of specialised life support to a higher-level facility. Specialist anaesthetic staff are on site during the day and provide an on-call service after hours.
- Level 3:** A hospital or day centre which undertakes a limited range of procedures, but does not have the capability to care for high-risk patients or surgery which necessitates high-level post-operative care. Specialist anaesthetic staff are on site during the day.
- Level 2:** A facility at which anaesthesia or sedation is provided to enable a single procedure to be undertaken on good-risk patients (such as stand-alone ECT or dentistry).
- Level 1:** Any other location at which anaesthesia or sedation is administered, such as a dental office.

If an institution or facility is in regional NSW, the suffix **R** is added and for private hospitals, the suffix **P**.

## Appendix F | Urgency of cases

### **Emergency**

Immediate surgery for a life-threatening condition (less than 30 minutes), e.g., ruptured abdominal aortic aneurysm, intracranial extra-dural haematoma, prolapsed umbilical cord.

### **Urgent**

At the earliest available time to prevent physiological deterioration (30 minutes-4 hours), e.g., ruptured viscus, appendicitis, open wound, blocked ventriculo-peritoneal shunt.

### **Urgent non-emergency**

The patient has a condition that requires emergency surgery, but there is time to allow medical optimisation and appropriate organisation of operating time and surgeons or surgical teams (4 hours to days), e.g., fractured neck of femur, pacemaker insertion, laparotomy for bowel obstruction.

### **Scheduled**

Where the patient presents for elective surgery.



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Nour Alatari, Western Sydney



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