



Australian and New Zealand
College of Anaesthetists

Safety of Anaesthesia in Australia

A review of anaesthesia related mortality 1997 – 1999

616.078 Dr Patricia Mackay, FRCA, FANZCA
SAF



SAFETY OF ANAESTHESIA IN AUSTRALIA

A REVIEW OF ANAESTHESIA RELATED MORTALITY 1997 – 1999

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

*Australian & New Zealand
College of Anaesthetists*

Editor:
P Mackay, FRCA, FANZCA

© Copyright - Australian and New Zealand College of Anaesthetists 2002. This work is copyright. No part may be reproduced without prior written permission from ANZCA, other than for bona fide personal use or research on a non-commercial basis.

The material contained in this document has been prepared based on information supplied from other persons and organisations. Whilst every effort has been taken to verify the accuracy of the information, no responsibility is taken by the publisher for any loss arising from reliance or use.

ISBN 0-9585208-2-8

CONTENTS

Index of Tables and Figures	4
Foreword	5
Committee	5
Executive Summary	6
Conclusions	6
Recommendations	7
Methods	8
Data collection	8
1. State Coronial Acts and the collection of data	8
2. Uniformity in analysing reports	8
System of classification	8
Findings	9
Number of deaths classified	9
Number of deaths considered in relation to population	9
Number of deaths attributable to anaesthesia related to population and numbers considered	10
Causal or contributory factors in anaesthesia-attributable deaths	11
Gender	12
Age	12
Level of risk	13
Degree of urgency	13
Type of Hospital	14
Location of death	14
Grade of anaesthetist	15
Types of surgery	16
Number of anaesthetics administered annually	16
Incidence of death attributable to anaesthesia	17
Incidence of death in patients considered to be good or fair risk	17
References	18
Appendices	19
Appendix 1: Terms of Reference of State Mortality Committees	19
Appendix 2: State Coronial Acts and the Collection of Data	24
Appendix 3: Glossary of Terms - Case Classification	26
Appendix 4: ASA Physical Status Classification System	28
Acknowledgements	28

INDEX OF TABLES AND FIGURES

Table 1.	System of classification by Anaesthesia Mortality Committees	8
Table 2.	Number of deaths classified by each Committee.....	9
Table 3.	Number of deaths classified related to population.....	9
Table 4.	Number of deaths during the triennium which were attributable to anaesthesia, related to the population and to the number of deaths considered.....	10
Table 5.	Number of anaesthesia-attributable deaths in comparison with previous reports	10
Table 6.	Causal or contributory factors in anaesthesia-attributable deaths.....	11
Figure 1.	Gender distribution in anaesthesia-attributable deaths	12
Figure 2.	Age distribution in anaesthesia-attributable deaths.....	12
Figure 3.	Level of risk of patients by ASA scale	13
Figure 4.	Degree of urgency of the operation	13
Table 7.	Type of Hospital.....	14
Table 8.	Location of death	14
Table 9.	Grade of anaesthetist	15
Table 10.	Types of surgery or procedure.....	16
Table 11.	Estimate of number of procedures during the year 1997 - 1998	17
Table 12.	Incidence of death in patients considered to be good or fair risk.....	17

FOREWORD

Data on deaths associated with anaesthesia have been collected in individual States since 1960. Reports were initially State-based with minimal co-ordination between individual State Committees regarding the data collected and its interpretation. Nevertheless, the desirability of national reporting was acknowledged, culminating in five national triennial reports commencing from 1985. The National Health and Medical Research Council (NHMRC) co-ordinated the first two reports, and the Australian and New Zealand College of Anaesthetists (ANZCA) has co-ordinated the last three. This current report covers the triennium 1997 - 1999.

It is pleasing to report that deaths wholly or partly due to anaesthesia have decreased from 1 in 26,000 anaesthetics in New South Wales in 1984, to 1 in 79,509 Australia-wide in this report. 1647 deaths were investigated and classified yielding 130 in which anaesthesia played some part. While any adverse outcome is regrettable, these figures are very good. The major aim of these mortality reports is to assist in making anaesthesia even safer.

The collection of accurate data, notably with regard to the number of anaesthetics administered per year, has always presented some difficulties, but the methodology has continued to improve. The current report is the most accurate to date.

The importance of this data is not simply for documentation of improved patient safety. It also represents a rich source of information for trainees and currently-practising anaesthetists, particularly the documentation of causal and contributory factors. Dissemination of this information will further contribute to patient safety.

This report would not be possible without the dedicated efforts of members of State Mortality Committees together with the provision, often voluntarily, of information from practising anaesthetists across the country. State Coroners have also willingly assisted. These efforts are gratefully acknowledged.

R J Willis
President, ANZCA
Chairman, Anaesthesia Mortality Committee

COMMITTEE

The Committee which produced this report comprised the Chairs of the State Mortality Committees and the President of the Australian and New Zealand College of Anaesthetists (ANZCA).

Dr Richard Willis (Chairman)	ANZCA
Dr Christopher Borton	New South Wales
Dr Peter Gartrell	South Australia
Dr Neville Gibbs	Western Australia
Dr Patricia Mackay	Victoria
Dr James Troup	Queensland
Mrs Carolyn Handley (Executive Officer)	ANZCA

State Mortality Committees

Details and Terms of Reference of State Mortality Committees - see Appendix 1.

EXECUTIVE SUMMARY

Conclusions

1. The numbers of anaesthesia attributable deaths were relatively constant for this triennium but there has been a 23% rise in the number of anaesthetic procedures. The 130 deaths over the triennium during which an estimated 10.5 million¹ anaesthetics were administered corresponds to a figure in the order of one death per 79,509 anaesthetic procedures. This figure shows a significant improvement of approximately 26.2% over previous triennial reports.
2. In future reports figures for the total number of anaesthetics administered in each State will be available from the Institute of Health and Welfare and this should provide a more accurate basis for the estimation of incidence of anaesthetic mortality. However the lack of a uniform reporting system, highlighted in all four previous reports, continues to cause difficulty in compiling a National Report. Mandatory reporting, as legislated in Western Australia, would appear to provide by far the most accurate indication of anaesthesia-attributable mortality. Coronial and State legislation in New South Wales and South Australia provides considerable support for identification of cases of interest to the Mortality Committees. In Victoria and Queensland, where the rate of notification is considerably lower, absence of mandatory reporting and confusing coronial legislation results in a lack of clear definition as to what constitutes a reportable anaesthetic death. This results in marked variation between States. Since 1993, despite at least three approaches to the State Coroners and one to the Department of the Victorian Attorney General by members of this Committee, no response has been received.
3. A major advance has been the acceptance by the various State Committees of a uniform Glossary of Terms (see Appendix 3) for classification purposes. This has resulted in improved correlation of the pooled information.
4. Most cases were assessed as having more than one causal or contributory factor when a death was attributed to factors under the control of the anaesthetist, the mean being 2.5 per case. This figure is similar to previous reports. The correctable anaesthetic factors most frequently identified were related to anaesthetic technique, inadequate pre-operative assessment and use of anaesthetic drugs. Organisational (or system) errors were also recognised in a significant number of cases.
5. The scope of anaesthetic practice has expanded considerably beyond the traditional areas of surgery and this is reflected in adverse events associated with non-surgical procedures, pain management and with the use of anaesthetic agents during resuscitation.
6. While 73% of deaths involved specialist anaesthetists who usually undertake the more complex cases, often also with a trainee, it is of concern that 27% involved non-specialist and trainee anaesthetists. This is an area that requires further analysis as to the level of supervision of trainees and the ongoing education of non-specialist anaesthetists, especially in rural areas.
7. 17 deaths occurred in a general ward area and the great majority of these were in high risk patients indicating that attention needs to be paid to ensuring that medically compromised patients undergoing complex surgery are managed peri-operatively in areas providing a higher staff/patient ratio and more specialised nursing and surveillance.

Recommendations

Based on the information received for the preparation of this report, the ANZCA Committee on Anaesthesia Mortality makes the following recommendations:

1. That the College continues to pursue urgent changes to the coronial legislation to ensure national uniformity in the reporting of all deaths associated with anaesthesia and sedation (as recommended in the two previous reports).
2. That there be a requirement for notification of all deaths where anaesthetic or sedative agents have been employed in association with non-surgical procedures, resuscitation or peri-operative pain management.
3. That there be increasing emphasis on adequate supervision of all trainees and on continuing education, training and credentialling for non-specialists.
4. That training in crisis management be imperative for all medical personnel undertaking anaesthesia or sedation for medical or surgical procedures.
5. That the anaesthetists in the ACT be encouraged to participate in providing mortality data.
6. That, while the lower reported rate for anaesthetic mortality is seen as satisfactory, it is important that the Committee continues to monitor the causes of such deaths and to produce triennial reports. It is anticipated that future reports should be able to provide more reliable statistical data.

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 - see Appendix 2

While there is mandatory reporting to Coroners in all States, there is lack of uniformity in the specification of death associated with anaesthesia in various State Coronial Acts about the reporting requirements. There is no definition of anaesthesia or specified range of procedure or uniformity of time interval and most of the Acts do not mention sedation as distinct from anaesthesia. Reporting to Anaesthetic Mortality Committees is not mandatory except in Western Australia and the efficacy of data collection depends on voluntary reporting and the degree of cooperation between the State Committee and the Coroner's office. Queensland and Victoria, with the least prescriptive requirements, have the lowest level of reporting relative to population - see Table 3.

2. Uniformity in analysing reports

In order to achieve greater uniformity between the States in analysing reports, the Committee in March 2000 agreed on a Glossary of Terms to be used wherever possible although not all Committees were able to adjust completely for this triennium - see Appendix 3.

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, i.e., Category A in Table 1.

Table 1. System of classification by Anaesthesia Mortality Committees

A. Death 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 death was caused by both surgical and anaesthesia factors.
Explanatory Notes:	
<ul style="list-style-type: none"> • <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> • <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, subcategory H should also be applied.</i> • <i>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.</i> 	
B. Death 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	Fortuitous 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.
C. Unassessable Death	
Category 7	Those that cannot be assessed despite considerable data but where the information is conflicting or key data are missing.
Category 8	Cases which cannot be assessed because of inadequate data.

FINDINGS

Number of deaths classified

The total number of deaths reviewed for the triennium 1997-99 was 1647 of which 130 were considered to be wholly or partly attributable to anaesthesia.

Table 2. Number of deaths classified by each Committee

	Classified	Definite	Probable	Jointly	Total Related to Anaesthesia
NSW & TAS	680	14	15	27	56
VIC	239	16	9	7	32
SA & NT	245	2	6	3	11
WA	377	7	2	2	11
QLD	106	8	5	7	20
Total	1647	47	37	46	130

22 additional cases were classified unassessable due to inadequate or conflicting data.

Tasmania reports cases to the New South Wales Committee and the Northern Territory to the South Australian Committee. There are no data from the Australian Capital Territory.

Number of deaths considered in relation to population

The total number of deaths considered by each Committee relative to the population in which the deaths occurred gives some indication of the efficiency of reporting. The population was taken at the mid point of June 1998*.

Table 3. Number of deaths classified related to population

	NSW & TAS	VIC	SA & NT	WA	QLD	Total
Population (x million) *	6.88	4.68	1.69	1.84	3.48	18.9
Total no. of deaths considered	680	239	245	377	106	1647
No. considered per million	98.83	51.06	144.97	204.89	30.45	87.14

* Population source - Australian Bureau of Statistics 1998²

As noted in previous reports differences in the reporting mechanisms and workings of the various Committees are probably the reason for the wide variation in figures for various States. Western Australia has the highest number of reports relative to the population due to legal requirements that all deaths up to 48 hours after anaesthesia must be reported to the Committee. Other States have less stringent requirements and in the case of Victoria and Queensland where the lowest figures are recorded, reporting is purely voluntary. For further details, refer to Appendices 1 and 2.

Number of deaths attributable to anaesthesia related to population and numbers considered

Table 4. Number of deaths during the triennium which were attributable to anaesthesia, related to the population and to the number of deaths considered

No. of deaths attributable to anaesthesia	130
No. of deaths attributable to anaesthesia per million population	6.88
No. of deaths attributable to anaesthesia per 100 considered	7.9

It can be seen that this figure approximates that in previous triennial reports, where approximately 8% of the deaths considered were attributed to anaesthesia in some way, the other 92% were due to other causes.

Table 5. Number of anaesthesia-attributable deaths in comparison with previous reports

	1991-93 3	1994-96 4	1997-99
NSW & TAS	55	62	56
VIC	23	35	32
SA & NT	9	10	11
WA	16	19	11
QLD	13	9	20
Total	116	135	130

While the figures are roughly similar there cannot be strict comparison as methods of collection have improved, there has been an increase in population and a marked rise in numbers of procedures performed. Thus the slight reduction in deaths for the present triennium can be regarded as most encouraging.

The disparity in total cases reviewed by each State reflects both population differences and lack of standardisation of methods of data collection.

Causal or contributory factors in anaesthesia-attributable deaths – see Appendix 3

The findings as to which aspect of anaesthetic management contributed to death are shown in Table 6.

Table 6. Causal or contributory factors in anaesthesia-attributable deaths

	NSW & TAS	VIC	SA & NT	WA	QLD	Total
A PREOPERATIVE	31	10	3	1	7	52
i assessment	20	7	3	0	5	35
ii management	11	3	0	1	2	17
B ANAESTHESIA TECHNIQUE	32	52	3	2	2	91
i technique (not ii or iii)	12	22	0	1	2	37
ii ventilation	2	5	0	1	0	8
iii airway maintenance	6	14	3	0	0	23
iv circulatory support	12	11	0	0	0	23
C ANAESTHESIA DRUGS	19	19	7	4	2	51
i selection	2	4	2	1	1	10
ii dosage	15	8	5	2	1	31
iii adverse event	1	7	0	1	0	9
iv incomplete reversal	1	0	0	0	0	1
v inadequate recovery	0	0	0	0	0	0
D ANAESTHESIA MANAGEMENT	13	8	2	1	2	26
i crisis management	6	3	1	1	2	13
ii inadequate monitoring	6	4	1	0	0	11
iii equipment failure	1	1	0	0	0	2
E POSTOPERATIVE	18	5	3	2	2	30
i management	6	3	1	1	2	13
ii supervision	6	4	1	0	0	11
iii inadequate resuscitation	1	1	0	0	0	2
F ORGANISATIONAL	12	11	0	1	4	28
i inadequate supervision or assistance	5	4	0	1	4	14
ii poor organisation	6	5	0	0	0	11
iii poor planning	1	2	0	0	0	3
G NO CORRECTABLE FACTOR	9	3	0	0	0	12
H MEDICAL CONDITION OF THE PATIENT A SIGNIFICANT FACTOR	NA	10	1	6	NA	17

In 12 cases no correctable factor could be identified.

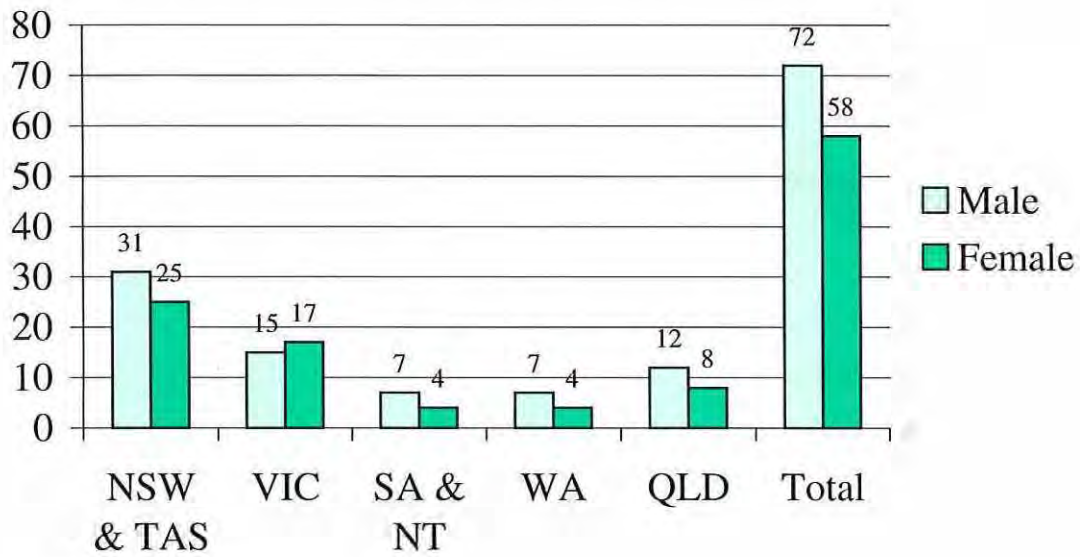
In 17 cases, while death was partly or wholly attributable to anaesthesia, the poor medical condition of the patient was considered an important factor. However, it was agreed that had New South Wales and Queensland been employing this classification during the triennium this figure would have undoubtedly been higher.

As in previous reports, inappropriate anaesthesia technique, employment of drugs and pre-operative assessment were the most frequently reported factors. Institutional organisational problems such as poor supervision and rostering, inadequate high dependency or ICU beds and poor communication were also identified with increasing frequency.

Gender

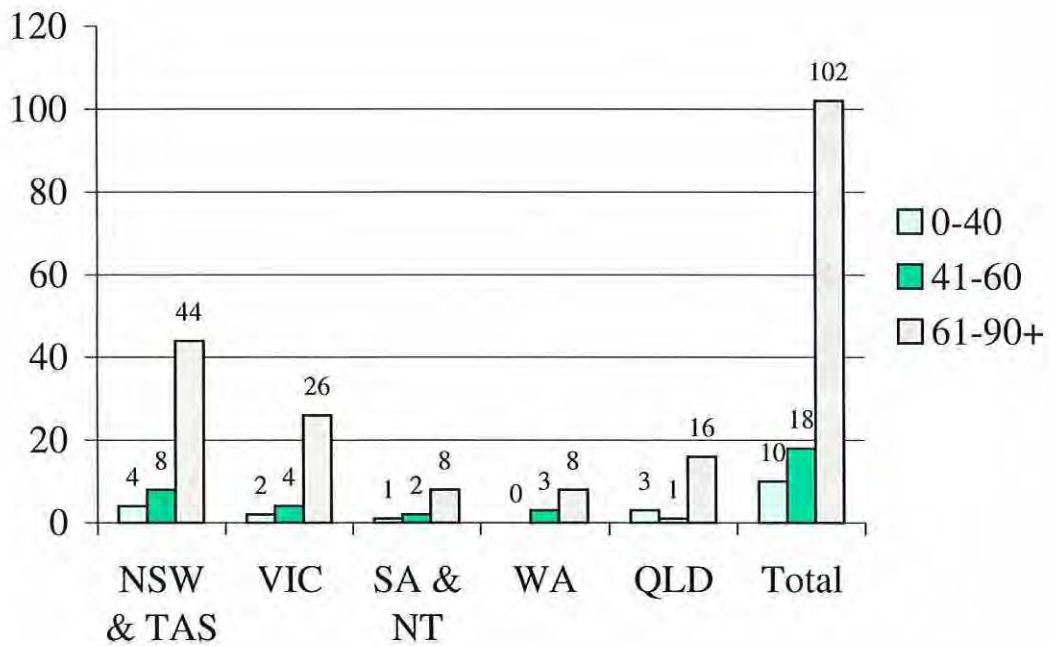
As in the two previous reports, there is a slight preponderance of males over females.

Figure 1. Gender distribution in anaesthesia-attributable deaths



Age

Figure 2. Age distribution in anaesthesia-attributable deaths

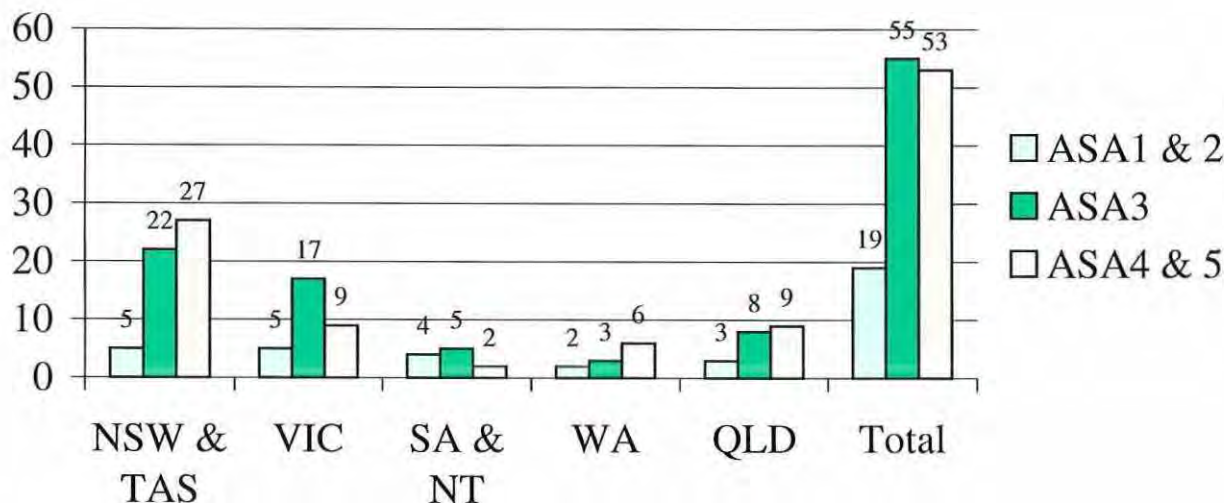


No anaesthesia-attributable deaths were recorded in children under 1 year and 78% of the deaths occurred in patients over the age of 60.

Level of risk

The level of risk has been quantified by use of the scale of the American Society of Anesthesiologists (ASA scale - see Appendix 4). While this is the best available classification, there is some scope for subjective variation, particularly between ASA levels 1, 2 and 3.

Figure 3. Level of risk of patients by ASA scale

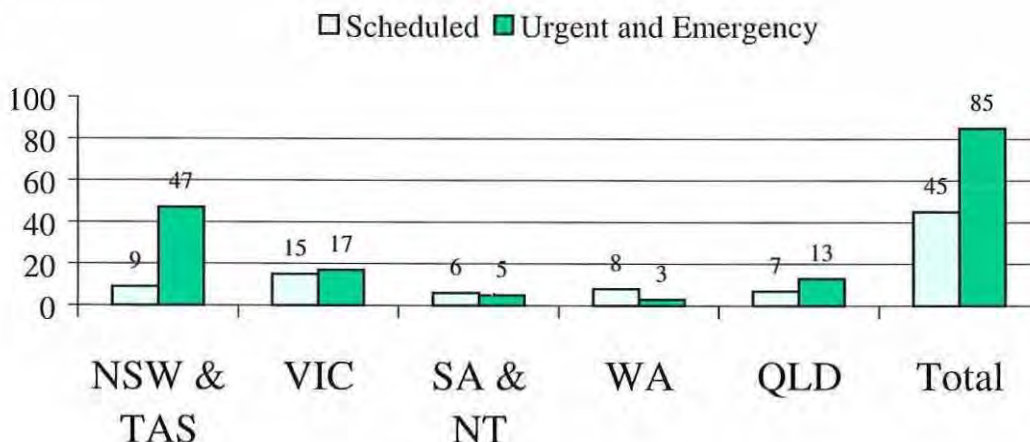


Three reports did not specify level of risk. There were 19 reports of ASA 1 and 2 patients where anaesthesia was wholly or partly responsible for the mortality. The slight increase in ASA 1 and 2 patients, compared with the previous triennium is of some concern and worthy of further evaluation.

Degree of urgency

A three-part scale is used. Emergency denotes an operation that must be performed as soon as possible. Urgent indicates a lesser degree of urgency where time is available to improve the patient's condition and the time of the operation can to some extent fit in with the availability of staff and operating theatres. Scheduled indicates that the case was booked at least 24 hours in advance.

Figure 4. Degree of urgency of the operation



While all patients undergoing elective surgery far outnumber those requiring emergency surgery, 65% of the anaesthesia-attributable cases required urgent surgery where it is widely recognised that such patients represent a greater risk.

Type of Hospital

Table 7 shows the distribution between various types of hospital. There is some variation between States in designating type of hospital. The definition of teaching hospital has been reserved for major public institutions which are tertiary referral centres with postgraduate training programs as well as undergraduate teaching. This classification will be reviewed in the next triennium.

Table 7. Type of Hospital

	Metropolitan Public Teaching	Metropolitan Non- Teaching	Rural Base	Rural Public Other	Private	Day Care (free standing)
NSW & TAS	34	9	5	3	5	
VIC	12	8	3	4	4	1
SA & NT	7		1	1	2	
WA	8	0	0	0	3	0
QLD	8	0	4	6	2	0
Total	69	17	13	14	16	1

As in previous reports, the majority of anaesthesia-attributable fatalities occurred in major metropolitan teaching hospitals. This was considered to be as a result of these hospitals being tertiary referral and also major trauma centres that treat the sickest and oldest patients, and undertake the most complex surgery.

Location of death

Table 8. Location of death

	Operating Theatre	Induction Room	Recovery Room	Procedural Room	ICU/High Dependency	General Ward	Not Specified
NSW & TAS	17		6		23	9	1
VIC	15		8	1	5	3	
SA & NT	4		3		4		
WA	4		3		2	2	
QLD	6		1		9	3	1
Total	46	0	21	1	43	17	2

While the majority of the deaths occurred in the operating theatre precincts or in high dependency units, there is concern that there were 17 deaths in a general ward area. This would indicate the additional risk of limited supervision for medically compromised patients undergoing complex surgery and the need for better access to high dependency post-operative care.

Grade of anaesthetist

Table 9 shows the grade of the anaesthetist. Where the principal anaesthetist who has submitted a report is a specialist, this report normally lists the anaesthetist as a specialist even though a supervised trainee may be involved. Information on the level of supervision has not been available in all States.

Table 9. Grade of anaesthetist

	Specialist	Non-Specialist	Trainee/Registrar	Other	Operator
NSW & TAS	44	2	8	1	1
VIC	21	4	6	1	0
SA & NT	10		1		
WA	8	0	3	0	
QLD	12	1	7	0	0
Total	95	7	25	2	1

The majority of deaths involved specialist anaesthetists who usually undertake the patients at highest risk. Trainees continue to be associated with a significant number of anaesthesia-attributable deaths and compared with the last triennium there is an increase in numbers involving non specialist anaesthetists.

Types of surgery

Table 10 depicts types of surgery or procedure.

Table 10. Types of surgery or procedure

	NSW & TAS	VIC	SA & NT	WA	QLD	Total
Abdominal	13	4	2	4	7	30
Cardiothoracic	5	1	0	1	1	8
Vascular	3	2	0	2	0	7
Neurosurgery	2	0	2	0	0	4
Orthopaedic	14	7	2	2	7	32
Urology	3	4	2	0	0	9
General (Non Abdominal)	2	4	0	0	3	9
ENT/Head and Neck	3	1	1	0	1	6
Eye	0	0	0	0	0	0
Renal	1	1	0	0	0	2
Gynaecological	0	1	0	1	0	2
Non-Invasive Procedural *						
Endoscopy	6	0	2	1	0	9
Cardiac	2	0	0	0	0	2
Radiological	0	0	0	0	0	0
Other						
Obstetric	1	1	0	0	0	2
Resuscitation *	0	4	0	0	0	4
Pain Management	0	2	0	0	1	3
Invasive Monitoring	1	0	0	0	0	1

The most common types of surgical procedures were orthopaedic, abdominal and urological.

* Most State Coronial Systems do not specify reporting of mortality associated with sedation for such procedures, therefore, it is believed that in this category, especially endoscopy, there is under-reporting. This may also apply to anaesthesia and sedation employed during resuscitation outside the operating theatre.

Number of anaesthetics administered annually

As in all previous reports, it has not been possible to identify the number of anaesthetics administered annually and in making an assessment of the incidence of anaesthesia-attributable deaths, the Committee has relied on indirect statistical evidence from an assessment of the number of surgical and other procedures performed where anaesthesia is likely to have been employed. Previous estimates were derived from the total numbers of separations from public and private hospitals obtained from the Australian Institute of Health and Welfare (AIHW). Again, for this triennium it has been necessary to employ this method, which is recognised as imprecise as the number of procedures done under no anaesthesia is unknown, while procedures performed in Emergency Departments and High Dependency Units may not be fully recorded. In addition there are no figures for private hospitals in ACT, Tasmania and Northern Territory. However, it is pleasing to note that as from the year 2000 - 2001, details of anaesthetic procedures in hospitals are being collected and it is expected that more accurate figures will be presented in the next triennium.

Table 11. Estimate of number of procedures during the year 1997-1998 *

Estimate of number of procedures during the year 1997-1998 *	
NSW	1,180,990
VIC	625,801
QLD	761,130
WA	390,157
SA	353,640
TAS **	54,425
ACT **	43,870
NT**	35,387
Total	3,445,400

* Source AIHW¹

** Information from private hospitals in TAS, ACT and NT not available

Thus it can be seen that there has been a significant increase in the estimated number of procedures performed compared with the previous triennium where the estimated figure, using similar methodology, was 2,838,812.

Incidence of death attributable to anaesthesia

Owing to the ongoing lack of uniformity in methods of reporting relevant deaths in the various States and in the absence of an accurate denominator for the number of anaesthetics administered, it is not possible to provide a true indication of the incidence of death attributable to factors within the province of the anaesthetist. However, with an estimated 10.336 million anaesthetics for the triennium (using 1998 as a one year sample in the middle of the triennium and multiplied for the total of the triennium) and 130 deaths considered, this would represent a figure in the order of 1 death per 79,509 anaesthetic procedures. This encompasses both low and high risk procedures and compares very favourably with previous estimates of 1/68,000 in 1991-93 and 1/63,000 in 1994-96. The reason for the decrease is a matter for speculation, however, contributing factors have almost certainly been:

- The adoption of approved standardised monitoring
- Widespread distribution of Professional Documents prepared by ANZCA
- Increased attention to continuing education
- The education contribution made by State Mortality Committees in alerting reporting anaesthetists and the larger body of anaesthetists to factors contributing to adverse outcomes.

It is also clear that the risk is very much lower for low risk patients although a lack of denominator data prevents any accurate prediction of risk for healthy patients.

Incidence of death in patients considered to be good or fair risk

Table 12. Incidence of death in patients considered to be good or fair risk

Triennium	Number of ASA1 & 2	Total Number of Category A Deaths	Percentage
1985-87 *	64	153	42%
1988-90 *	37	92	40%
1991-93 **	30	116	26%
1994-96 **	13	135	9.6%
1997-99 **	19	130	14.61%

This table demonstrates that there has been a marked reduction in the proportion of anaesthesia-attributable deaths in healthy patients since 1985 when national reports were first published. In the current triennium, there were 19 cases of which 3 were classified as G where no better technique could be suggested. The remaining cases had an average of 3.1 correctable factors.

*The first two reports were published by the National Health and Medical Research Council ^{3,4}

** Subsequent reports have been under the auspices of the Australian and New Zealand College of Anaesthetists ^{5,6}

REFERENCES

1. Australian Institute of Health and Welfare (AIHW) 2002. AIHW Website: www.aihw.gov.au/publications/health - Australian Hospital Statistics 1997 - 99.
2. Australian Bureau of Statistics. Publication: Australian Demographic Statistics, Estimated Resident Population 1998, Catalogue # 3101.0, Table 4.
3. National Health and Medical Research Council. Report of Anaesthetic Related Mortality in Australia 1985 - 1987.
4. National Health and Medical Research Council. Report on Deaths Associated with Anaesthesia 1988 - 1990.
5. Australian and New Zealand College of Anaesthetists: Anaesthesia Related Mortality in Australia 1991 - 1993. Editor: B F Horan, FRCA, FANZCA.
6. Australian and New Zealand College of Anaesthetists: Anaesthesia Related Mortality in Australia 1994 - 1996. Editor: N J Davis, AM, FANZCA.

APPENDICES

APPENDIX 1

TERMS OF REFERENCE OF STATE MORTALITY COMMITTEES

NEW SOUTH WALES SPECIAL COMMITTEE INVESTIGATING DEATHS UNDER ANAESTHESIA (SCIDUA)

This is a Ministerial Committee established in 1960 to enquire into deaths arising, during or as a result of anaesthesia. The Committee has met regularly since its inception, except for a three year period from mid 1980 to mid 1983 when there was concern about lack of legal safeguards for confidentiality of the Committee's activities. The primary function of the Committee is to review deaths related to anaesthesia and to give a report of this review of the anaesthetic management in each case to the anaesthetist involved.

Composition

The Committee consists of representatives nominated by:

- Australian and New Zealand College of Anaesthetists
- Australian Society of Anaesthetists
- NSW Department of Health
- Royal Australasian College of Surgeons
- Royal Australian College of General Practitioners
- Royal Australian College of Obstetricians and Gynaecologists
- Royal College of Pathologists of Australasia
- University of Newcastle, Department of Anaesthesia and Intensive Care
- University of NSW, Disciplines of Anaesthesia and Surgery
- University of Sydney, Departments of Anaesthetics and Surgery, and
Medical Secretary, Assistant Medical Secretary

Legislative Privilege

The Health Administration Act 1982 Section 23 gives the Minister authority to gazette bodies conducting investigations into morbidity or mortality for privilege in relation to information obtained. SCIDUA was scheduled as such a body on 9 December 1982 under Section 20(4) of the Act. Freedom of Information Act 1989 Schedule 1 Sections 8,12,13 exempts the Committee's documents from public access.

Case Reporting

When a death is required under the Coroners Act to be reported to the Coroner, the patient's name is notified to the Special Committee by arrangement with the Coroner's office. The SCIDUA Secretariat then contacts the anaesthetist concerned requesting case details on the SCIDUA Report Form.

Case Reviews

The Committee meets monthly to review cases reported. The names of patient, hospital and anaesthetist are deleted from the forms circulated to Committee members. In addition to each clinical report, details are also given to Committee members regarding status of the anaesthetist (consultant, registrar, etc), age and sex of the patient and date of death. All case report forms reviewed by Committee members are returned to the Secretariat when the cases have been considered.

Reporting Processes

The reporting anaesthetist is notified of the Committee's classification of the death. When one or more anaesthetic factors is considered to have contributed to the fatal outcome, this takes the form of a personal letter from the Chairman. SCIDUA also receives and analyses reports from Tasmania.

Other Reports

A report is sent to the Minister annually. Matters of importance or concern regarding anaesthetic practices are brought to the attention of anaesthetists generally by reports in Specialist Journals.

VICTORIAN CONSULTATIVE COUNCIL ON ANAESTHETIC MORTALITY AND MORBIDITY

The Victorian Consultative Council on Anaesthetic Mortality and Morbidity was established in 1976 by the Minister for Health under Section 13 of the Health Act 1958 following representations from the Faculty of Anaesthetists of the Royal Australasian College of Surgeons and recommendations from the National Health and Medical Research Council.

Membership

The members of Council are:

The Chairman, a specialist anaesthetist appointed by the Minister.

8 specialist anaesthetists nominated by:

- The Australian Society of Anaesthetists
- The Australian and New Zealand College of Anaesthetists
- Victorian Teaching and Regional Hospitals

Nominated representatives of:

- The Australian and New Zealand Intensive Care Society
- Royal Australasian College of Surgeons
- Royal College of Pathologists of Australasia
- The Victorian Institute of Forensic Medicine
- Australasian College for Emergency Medicine
- Royal Australian College of General Practitioners
- Department of Human Services

Members are appointed for three years.

Terms of Reference of the Council are:

- 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 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 Statewide Victorian Quality Council.
- To respond to specific matters referred to the Council by the Minister for investigation and reporting, as required.

The Victorian Council is the only State Mortality Council which also has a brief to report on significant morbidity associated with anaesthesia.

Case Reporting

Reporting is entirely voluntary and dependent on the goodwill of Victorian anaesthetists. The Chairman of the Council also has access to Coroners files, which are public documents and the Council uses these files to gather further information, as necessary.

Sentinel Events

As of July 2001, the Department of Human Services clinical risk management strategy requires the mandatory reporting of a small number of serious adverse (sentinel) events of mortality and morbidity by public hospitals. As a result, the Council has a key role in reviewing those sentinel events and their associated root cause analyses which are relevant to anaesthesia and perioperative complications.

Confidentiality and Exchange of Information

It is emphasised that, whatever the source of the data, confidentiality is maintained at all times. Only the Chairman has access to any information identifying the reporting doctor, other medical staff, the patient or the Hospital. No Council information is passed on to the State Coroner's Office or to any other individual or institution except in a most general sense when advice is sought for preventive strategies. The Consultative Council is listed as a prescribed council under the Health (Prescribed Consultative Council) Regulations 1986 and the provisions of the Health Act 1958, Section 24A apply. Thus no personal information of any sort may be released to any authority under any circumstances unless authorised by both the Minister for Health and the reporting doctor. Within the Freedom of

Information Act there is provision that access to information held by the Consultative Council would be subject to the same conditions as detailed in Section 24A of the Health Act. Because of the strict provisions for confidentiality, it is possible for the Chairman to have detailed discussions with the reporting anaesthetist on any particular adverse outcome. This is seen as very important in proper evaluation of such events.

Council Website: <http://vccamm.health.vic.gov.au>

SOUTH AUSTRALIAN PERIOPERATIVE MORTALITY COMMITTEE

This Committee was established under the South Australian Health Commission Act in 1987, replacing the South Australian Anaesthetics Mortality Committee which had functioned since 1969. Because of concern about lack of legal safeguards for confidentiality of the Committee's activities, reporting to the new Committee did not commence until mid-1991.

The aims of the Perioperative Mortality Committee are:

- To review each death occurring in association with operations or procedures performed under local, regional and/or general anaesthesia from an anaesthetic, pharmacological, surgical and pathological perspective, and to collate this information.
- Similarly, to review each death occurring in association with operations or procedures performed with the assistance of sedative and/or analgesic drugs.
- To determine and monitor the epidemiology of these deaths in South Australia.
- To identify those factors which merit special study and/or action.
- To provide confidential information to notifying medical practitioners upon request.
- To disseminate information obtained from the Committee's research by means of reports to the South Australian Health Commission and Professional Meetings on an annual basis.
- To report to Professional Journals when sufficient significant data has been obtained to warrant such an action.
- To produce a comprehensive report at least every five years for distribution to the Medical Profession generally within South Australia.

Composition

The Committee consists of seven anaesthetists, one intensive care specialist, two surgeons, one pathologist, and two registered nurses specialising in Recovery Room Nursing, appointed by the Minister.

Collection of Data

Anaesthetists and surgeons in South Australia report voluntarily to the Perioperative Mortality Committee on its standard form regarding cases which fall into the definition of a death which occurs during an operation or procedure (or within 24 hours of its completion) performed with the assistance of sedative, analgesic, local or general anaesthetic drugs or any combination of these, or, a death which may be the result (either partially or totally) of an incident during or after such operation or procedure even if more than 24 hours has elapsed since its completion.

Process Of Case Review

All reports are submitted to the Chairman of the Committee. The Chairman then gathers any further information he considers necessary from the Coroner's files, from the surgeon and anaesthetist and from hospital notes etc. When this has been completed, all means of identification are removed from the reports and additional information. Copies are then made of the "sterilised" information and together with a summary of each case, distributed to the members of the Committee at least two weeks prior to the meeting at which they are to be considered. Any information which may identify any person involved in submitting the report or in the case itself is destroyed once the case has been finalised. Once the Committee has classified the case, a hard copy of this is made together with a summary of the case and any pertinent comments by the Committee and attached to the particular report. The classification and all data of an epidemiological nature is saved.

Legislative Privilege

This is provided by Section 64d of the South Australian Health Commission Act (1976) amended in 1989 and proclaimed in 1991.

The Committee also reviews and analyses reports from the Northern Territory.

QUEENSLAND COMMITTEE TO ENQUIRE INTO PERIOPERATIVE DEATHS

This Committee has been in existence since 1975. Much preliminary work involved procedural matters during the early days. The official status of the Committee was established by order-in-Council and published in the Government Gazette of 21 February 1976 when it was made a research project under Section 154M, Part iv(c) of the Health Act under the Chairmanship of the Director-General of Health and Medical Services. The first case histories were considered by the Committee in 1977.

The following bodies nominate members to be on the Committee:

- Australian and New Zealand College of Anaesthetists
- Royal Australasian College of Surgeons
- Australian Society of Anaesthetists
- Australian Medical Association
- Royal College of Pathologists of Australasia
- Australian Dental Association
- Royal Australian and New Zealand College of Obstetricians and Gynaecologists
- Faculty of Medicine, University of Queensland
- Faculty of Dentistry, University of Queensland
- Acute Private Hospitals Association of Queensland
- Royal Australian College of General Practitioners (Queensland Faculty)

Once appointed they are members of a confidential statutory committee and do not report back to the organisation, other than on policy matters.

Establishment under Section 154M

The purpose of using Section 154M, Part iv(c) was to encourage the supply of information to the responsible investigator and to protect both the information and the source from which it came. Such information supplied to the Committee is not admissible in any proceedings without the approval of the Governor-in-Council and the persons supplying the information cannot be compelled without their consent to answer any questions concerning the information supplied.

All information is considered highly confidential and is examined by the Committee without knowledge of names of patients, doctors or hospitals.

Although the Committee had originally been established at the request of anaesthetists to look at deaths which may have been associated with anaesthesia, by 1987 it was apparent that the Committee would more appropriately be named the "Committee to Enquire into Perioperative Deaths".

THE ANAESTHETIC MORTALITY COMMITTEE OF WESTERN AUSTRALIA

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 Chairman, having regard to the cases to be discussed, invites two of the provisional members to make up, with the 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 Chairman of the Committee.
- A medical practitioner nominated by the Commissioner of Health.
- A specialist anaesthetist nominated by the Senate of the University of Western Australia.

A specialist anaesthetist nominated by the Australian Society of Anaesthetists.

A specialist anaesthetist nominated by the 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 State Commissioner of Health.

The Commissioner, on receipt of a report of an anaesthetic 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 as much to the Commissioner, and that, as 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 prepares a case report for the Chairman 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 Chairman, having received the reports, selects two provisional members to make up the Committee of seven. The report is then considered by the Committee which determines the cause of death and whether the conduct of the anaesthetic played any part.

Confidentiality

The report of the investigator to the Chairman is in the form of a medical report with identification of persons and places removed. The Chairman 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 Commissioner 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 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.

Website - www.anaesthesia-wa.iinet.net.au/amc1.html

APPENDIX 2**STATE CORONIAL ACTS AND THE COLLECTION OF DATA****WESTERN AUSTRALIA*****Coroners Act 1996***

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

Data Collection for the Anaesthetic Mortality Committee of Western Australia (AMC)

The State Commissioner of Health, on receipt of a report of an anaesthetic death, directs the investigator to enquire into the circumstances of the death. If the investigator is of the opinion that the death is likely to have been due in some measure to the anaesthetic, he/she prepares a case report for the Chairman of the Committee. 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.

This would appear to be the most effective means of collecting data.

NEW SOUTH WALES***Coroners Act 1980***

A coroner is obliged to hold an inquest into a death which occurs during/as a result of /within 24 hours of the administration of an anaesthetic which was given as part of a medical/surgical/dental or similar procedure (excluding a local anaesthetic employed for purposes of resuscitation.)

Data Collection for the NSW Special Committee Investigating Deaths Under Anaesthesia (SCIDUA)

When a death required under the act is reported to the Coroner, the patient's name is notified to SCIDUA by arrangement with the Coroner's office. The SCIDUA secretariat then contacts the anaesthetist concerned requesting case details on the special report form.

It is believed that this State achieves a very high level of data collection.

VICTORIA***Coroners Act 1985***

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

Data Collection for the Victorian Consultative Council on Anaesthetic Mortality and Morbidity

Reporting is entirely voluntary and dependent on the goodwill and support of Victorian anaesthetists. The Chairman also has access to the Coroner's files which are public documents and uses these files, if possible, to gain further information directly from the anaesthetist.

SOUTH AUSTRALIA***Coroners Act 1975***

There is no specific definition of a reportable death.

Data Collection for the South Australian Perioperative Mortality Committee

Anaesthetists and surgeons report voluntarily on a standard form regarding cases which fall within the following definition “a death which occurs during an operation or procedure (or within 24 hours of its completion) performed with the assistance of sedative, analgesic, local or general anaesthetic drugs or any combination of these or a death which may be the result (either totally or partially) of an incident during or after such an operation or procedure even if more than 24 hours has elapsed. This definition is almost identical to that used by the South Australian Coroner, from whom the Committee receives complete cooperation.

TASMANIA***Coroners Act 1995***

A reportable death is one that occurs during or as a result of anaesthesia or sedation (and is not due to natural causes).

Data Collection for Tasmania

Data from Tasmania is collected and reviewed by the New South Wales Special Committee Investigating Deaths Under Anaesthesia.

NORTHERN TERRITORY***Coroners Act 1993***

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

Data Collection for Northern Territory

Data from the Northern Territory is collected and reviewed by the South Australian Perioperative Mortality Committee.

AUSTRALIAN CAPITAL TERRITORY***Coroners Act 1997***

A coroner has jurisdiction to hold an inquest into the manner and cause of death if the person died during/72 hours after/as a result of:

- a medical/ surgical/ dental/ or similar operation
- an invasive medical or diagnostic procedure

This section does not apply if the medical practitioner in charge of the procedure provides a certificate stating that the person's death was not the result of the procedure, and the procedure is:

- a. the giving of an intravenous injection
- b. the giving of an intramuscular injection
- c. intravenous therapy
- d. the insertion of a line or cannula
- e. artificial ventilation
- f. cardiac resuscitation
- g. urethral catheterisation

Data Collection for Australian Capital Territory

The ACT does not have a State Mortality Committee and does not report cases to any other State Committee.

APPENDIX 3

ANAESTHESIA MORTALITY

GLOSSARY OF TERMS CASE CLASSIFICATION	
A. 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 death was caused by both surgical and anaesthesia factors.
Explanatory Notes	
<ul style="list-style-type: none"> • <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> • <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 subcategory H should also be applied.</i> • <i>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.</i> 	
B. Death 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	Fortuitous 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. Unassessable Death	
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.
Category 9	A critical incident where a problem is identified but no mortality occurs.
Category 10	Mortality in which anaesthesia and surgical techniques were apparently satisfactory.
CASUAL OR CONTRIBUTORY FACTORS IN CATEGORY A DEATH	
<i>Note that it is usual for more than one factor to be identified in the case of anaesthesia attributable death.</i>	
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 (e.g. bypass).
(iv) Circulatory Support	Failure to provide adequate support where there is haemodynamic instability, in particular in relation to techniques involving sympathetic blockade.
C. Anaesthesia Drugs	
(i) Selection	Administration of a wrong drug or one which is 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 or severe injury.
(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.
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 (eg. 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.	

APPENDIX 4

AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) PHYSICAL STATUS CLASSIFICATION SYSTEM

Grade 1

A normal healthy patient

Grade 2

A patient with mild systemic disease.

Grade 3

A patient with severe systemic disease.

Grade 4

A patient with severe systemic disease that is a constant threat to life.

Grade 5

A moribund patient who is not expected to survive without the operation.

Excerpted from American Society of Anesthesiologists *Manual for Anesthesia Department Organization and Management* 2001. A copy of the full text can be obtained from ASA, 520 N Northwest Highway, Park Ridge, Illinois 60068-2573

Acknowledgements

The Members of the Working Party wish to record their gratitude to Members and their Support Staff, of the State Mortality Committees. The assistance of Ms Pauline Berryman, Assistant, Victorian Consultative Council on Anaesthetic Mortality and Morbidity, and Mrs Carolyn Handley, Executive Officer, ANZCA, in compiling this report is gratefully acknowledged. The Australian Institute of Health and Welfare (AIHW) in providing statistical data via AIHW website, is also gratefully acknowledged.



Australian and New Zealand
College of Anaesthetists

ABN 82 055 042 852