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SECTION 7  PERINATAL MORTALITY CLASSIFICATIONS

7.1 Introduction

This document presents the third revision of the Perinatal Society of Australia and New Zealand (PSANZ) classifications for perinatal death (Perinatal Death and Neonatal Death Classifications) and the accompanying Classification Guide (which provides a detailed description of the classification and case examples) which was first released in May 2003. The PSANZ Classifications and Guide for use are a result of the collaborative efforts of members of the PSANZ over many years. This activity has been focused on development of a uniform classification system for Australia and New Zealand, of perinatal mortality by antecedent cause using the PSANZ Perinatal Death Classification and, in addition for neonatal deaths, by conditions in the neonatal period, or prior to discharge home, leading to the death using the PSANZ Neonatal Death Classification.

The November 2004 revision included the ability to classify factors associated with perinatal death. Following classification of the main obstetric antecedent factor according to the PSANZ-PDC, and in addition for neonatal deaths the neonatal factor according to the PSANZ-NDC, it is now recommended that up to two associated factors can be recorded using the classifications.

For example, when the death was due to placental abruption which was preceded by pre-eclampsia, according to the PSANZ-PDC, the death is classified as Hypertension - Pre-eclampsia (subcategory 3.5) and the associated factor is classified as Antepartum Haemorrhage Placental Abruption (subcategory 4.1).

The changes made in this update are not considered to be major and are summarized in Appendix 1.

In addition to application of the classification, the PSANZ PMG recommends collection of a standardised data set included in a comprehensive confidential clinical summary to facilitate local audit and, if required, forwarded to the relevant jurisdiction’s Health Department. The PSANZ Perinatal Mortality Audit Package (Section 2; Appendix 1) is recommended for this purpose. This data set includes all significant family, medical and obstetric history; all major pregnancy complications including whether the pregnancy was terminated; and investigations undertaken around the time of the death including placental histopathology and autopsy. A different data collection tool is currently being used across New Zealand. A working party is being established to review this data collection with the aim of reaching agreement on a minimum data set for use in Australia and New Zealand.

7.2 Purpose of the Classifications

The purpose of the PSANZ Perinatal Death Classification (PSANZ-PDC) is to identify the single most important factor which led to the chain of events which resulted in the death.

The purpose of the PSANZ Neonatal Death Classification (PSANZ-NDC) is in addition to the PSANZ-PDC to identify the single most important factor in the neonatal period which caused the death.

7.3 Background

Since 1986, clinicians in some Australian States and Territory Perinatal Committees (notably South Australia and Queensland) and the Perinatal Mortality Committee at the National Women’s Hospital in Auckland, have been considering ways of classifying fetal and neonatal deaths beyond standard ICD (International Classification of Diseases) coding, with a view to better assessing aetiology (in order to consider preventable factors) and to more accurately determine specific factors leading to neonatal death.

Experience with the Whitfield obstetric antecedent classification(1) led to realisation that there were shortcomings with this system - it was not hierarchical and did not accommodate more recent knowledge about the causation of some perinatal deaths. Modifications of the Whitfield system were made and published independently by the South Australian and Queensland committees and in the National Women’s Hospital report. In 1999, the National Perinatal Data Development Committee (NPDDC) recommended that the topic be further considered at a workshop to be held about the time of the 4th Annual Conference of the Perinatal Society of Australia and New Zealand, held in Brisbane on the 16th March 2000, attended by representatives of most jurisdictions. This was the third such workshop, the two previous being in Brisbane 1996 and Alice Springs 1998. At this workshop it was agreed to attempt to develop uniform classification systems for use throughout Australia and New Zealand. It was agreed that drafts be developed by the Queensland and South Australian...
representatives, and circulated for comment and discussion, to representatives from the other Australian States and Territories and from New Zealand, with a view to presenting a consensus to the NPDDC in July 2000. Consensus was reached and the finalised classifications were accepted by the NPDDC.

The classifications systems were originally named the Australian and New Zealand Antecedent Classification of Perinatal Mortality (ANZACPM), and the Australian and New Zealand Neonatal Death Classification (ANZNDC). Following endorsement of this activity as a Special Interest Group of the PSANZ in March 2003, the classifications have been renamed to the Perinatal Society of Australia and New Zealand Perinatal Death Classification (PSANZ-PDC) and the Perinatal Society of Australia and New Zealand Neonatal Death Classification (PSANZ-NDC). A description of the classification development in the context of other classification systems was recently published in the Journal of Paediatrics and Child Health(2).

The PSANZ-PDC is intended for use in a hierarchical manner in relation to its major categories, but not within subcategories. This is reflected in the numbering system used. Thus Category 1 Congenital Abnormality, if present, would take precedence over other categories. However, in some situations, this hierarchical system may not apply, as in the relationship between Category 3 Hypertension or Category 4 Antepartum Haemorrhage and Category 5 Maternal Conditions, and each case may need to be coded according to its own particular clinical circumstances.

As far as possible, the subcategory .8 has been used for ‘Other conditions’ and .9 for ‘Unspecified conditions’ within its category, as has been the case in the ICD classification. PSANZ-PDC is a 4 digit coding system. If data are entered with a decimal point, a subcategory such as ‘Central nervous system’ (Category 1 Congenital Abnormality) would be 1.1, but as a 4 digit numeric would be 0110. Similarly subcategory ‘Group B Streptococcus’ (Category 2, Perinatal Infection) would be 2.11 or 0211, while subcategory Consistent with SIDS (Category 11, No Obstetric Antecedent) would be 11.11 or 1111.

PSANZ-NDC is not intended for use in a hierarchical manner. However, its Category 1 is also Congenital Abnormality, in keeping with PSANZ-PDC, which takes precedence over other categories. It is a 3 digit coding system.
7.4 PSANZ Perinatal Mortality Classification

7.4.1 PSANZ Perinatal Death Classification (PSANZ-PDC)

1 Congenital abnormality (including terminations for congenital abnormalities)
   1.1 Central nervous system
   1.2 Cardiovascular system
   1.3 Urinary system
   1.4 Gastrointestinal system
   1.5 Chromosomal
   1.6 Metabolic
   1.7 Multiple/non chromosomal syndromes
   1.8 Other congenital abnormality
      1.81 Musculoskeletal
      1.82 Respiratory
      1.83 Diaphragmatic hernia
      1.84 Haematological
      1.85 Tumours
      1.88 Other specified congenital abnormality
   1.9 Unspecified congenital abnormality

Please note that terminations of pregnancy for perinatal deaths within this category should be identified by the inclusion of an “09” for two-digit codes and a “9” for the three digit codes

2 Perinatal infection
   2.1 Bacterial
      2.11 Group B Streptococcus
      2.12 E coli
      2.13 Listeria monocytogenes
      2.14 Spirochaetal e.g. Syphilis
      2.18 Other bacterial
      2.19 Unspecified bacterial
   2.2 Viral
      2.21 Cytomegalovirus
      2.22 Parvovirus
      2.23 Herpes simplex virus
      2.24 Rubella virus
      2.28 Other viral
      2.29 Unspecified viral
   2.3 Protozoal e.g. Toxoplasma
   2.5 Fungal
   2.8 Other specified organism
   2.9 Other unspecified organism

3 Hypertension
   3.1 Chronic hypertension: essential
   3.2 Chronic hypertension: secondary, e.g. renal disease
   3.3 Chronic hypertension: unspecified
   3.4 Gestational hypertension
   3.5 Pre-eclampsia
      3.51 With laboratory evidence of thrombophilia
   3.6 Pre-eclampsia superimposed on chronic hypertension
      3.61 With laboratory evidence of thrombophilia
   3.9 Unspecified hypertension

4 Antepartum haemorrhage (APH)
   4.1 Placental abruption
      4.11 With laboratory evidence of thrombophilia
   4.2 Placenta praevia
   4.3 Vasa praevia
   4.8 Other APH
   4.9 APH of undetermined origin
5 Maternal conditions
5.1 Termination of pregnancy for maternal psychosocial indications
5.2 Diabetes / Gestational diabetes
5.3 Maternal injury
   5.31 Accidental
   5.32 Non-accidental
5.4 Maternal sepsis
5.5 Antiphospholipid syndrome
5.6 Obstetric cholestasis
5.8 Other specified maternal conditions

6 Specific perinatal conditions
6.1 Twin-twin transfusion
6.2 Fetomaternal haemorrhage
6.3 Antepartum cord complications
   6.31 Cord haemorrhage
   6.32 True knot with evidence of occlusion
   6.38 Other
   6.39 Unspecified
6.4 Uterine abnormalities, eg bicornuate uterus, cervical incompetence
6.5 Birth trauma (typically infants of >24 weeks gestation or >600g birthweight)
6.6 Alloimmune disease
   6.61 Rhesus
   6.62 ABO
   6.63 Kell
   6.64 Alloimmune thrombocytopenia
   6.68 Other
   6.69 Unspecified
6.7 Idiopathic hydrops
6.8 Other specific perinatal conditions
   6.81 Rupture of membranes after amniocentesis
   6.82 Termination of pregnancy for suspected but unconfirmed congenital abnormality.
   6.83 Fetal subdural haematoma
   6.88 Other
   6.89 Unspecified

7 Hypoxic peripartum death (typically infants of >24 weeks gestation or >600g birthweight)
7.1 With intrapartum complications
   7.11 Uterine rupture
   7.12 Cord prolapse
   7.13 Shoulder dystocia
   7.18 Other
7.2 Evidence of non-reassuring fetal status in a normally grown infant (e.g. abnormal fetal heart rate, fetal scalp pH/lactate, fetal pulse oximetry without intrapartum complications)
7.3 No intrapartum complications and no evidence of non-reassuring fetal status.
7.9 Unspecified hypoxic peripartum death

8 Fetal Growth Restriction (FGR)
8.1 With evidence of reduced vascular perfusion on Doppler studies and/or placental histopathology (e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
8.2 With chronic villitis
8.3 No placental pathology
8.4 No examination of placenta
8.8 Other specified placental pathology
8.9 Unspecified or not known whether placenta examined
9 Spontaneous preterm (<37 weeks gestation)

9.1 Spontaneous preterm with intact membranes, or membrane rupture <24 hours before delivery
  9.11 With chorioamnionitis on placental histopathology
  9.12 Without chorioamnionitis on placental histopathology
  9.13 With clinical evidence of chorioamnionitis, no examination of placenta
  9.17 No clinical signs of chorioamnionitis, no examination of placenta
  9.19 Unspecified or not known whether placenta examined

9.2 Spontaneous preterm with membrane rupture ≥24 hours before delivery
  9.21 With chorioamnionitis on placental histopathology
  9.22 Without chorioamnionitis on placental histopathology
  9.23 With clinical evidence of chorioamnionitis, no examination of placenta
  9.27 No clinical signs of chorioamnionitis, no examination of placenta
  9.29 Unspecified or not known whether placenta examined

9.3 Spontaneous preterm with membrane rupture of unknown duration before delivery
  9.31 With chorioamnionitis on placental histopathology
  9.32 Without chorioamnionitis on placental histopathology
  9.33 With clinical evidence of chorioamnionitis, no examination of placenta
  9.37 No clinical signs of chorioamnionitis, no examination of placenta
  9.39 Unspecified or not known whether placenta examined

10 Unexplained antepartum death

10.1 With evidence of reduced vascular perfusion on Doppler studies and/or placental histopathology (e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
  10.2 With chronic villitis
  10.3 No placental pathology
  10.4 No examination of placenta
  10.8 Other specified placental pathology
  10.9 Unspecified or not known whether placenta examined

11 No obstetric antecedent

11.1 Sudden Infant Death Syndrome (SIDS)
  11.11 SIDS Category IA: Classic features of SIDS present and completely documented.
  11.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.
  11.13 SIDS Category II: Infant deaths that meet Category I except for one or more features.
  11.2 Postnatally acquired infection
  11.3 Accidental asphyxiation
  11.4 Other accident, poisoning or violence (postnatal)
  11.8 Other specified
  11.9 Unknown/Undetermined
  11.91 Unclassified Sudden Infant Death
  11.92 Other Unknown/Undetermined
7.4.2 PSANZ Neonatal Death Classification (PSANZ-NDC)

1. Congenital abnormality (including terminations for congenital abnormalities)
   1.1 Central nervous system
   1.2 Cardiovascular system
   1.3 Urinary system
   1.4 Gastrointestinal system
   1.5 Chromosomal
   1.6 Metabolic
   1.7 Multiple/non chromosomal syndromes
   1.8 Other congenital abnormality
      1.81 Musculoskeletal
      1.82 Respiratory
      1.83 Diaphragmatic hernia
      1.84 Haematological
      1.85 Tumours
      1.88 Other specified congenital abnormality
   1.9 Unspecified congenital abnormality

2. Extreme prematurity (typically infants of ≤24 weeks gestation or ≤600g birthweight)
   2.1 Not resuscitated
   2.2 Unsuccessful resuscitation
   2.9 Unspecified or not known whether resuscitation attempted

3. Cardio-respiratory disorders
   3.1 Hyaline membrane disease / Respiratory distress syndrome (RDS)
   3.2 Meconium aspiration syndrome
   3.3 Primary persistent pulmonary hypertension
   3.4 Pulmonary hypoplasia
   3.5 Chronic neonatal lung disease (typically, bronchopulmonary dysplasia)
   3.6 Pulmonary haemorrhage
   3.7 Pneumothorax
   3.8 Other

4. Infection
   4.1 Bacterial
      4.11 Congenital bacterial
         4.111 Group B Streptococcus
         4.112 E coli
         4.113 Lysteria monocytogenes
         4.114 Spirochaetal, eg syphilis
         4.118 Other bacterial
         4.119 Unspecified bacterial
      4.12 Acquired bacterial
         4.121 Group B Streptococcus
         4.122 E coli
         4.125 Other Gram negative bacilli (other than E coli)
         4.126 Staphylococcus aureus
         4.127 Coagulase negative Staphylococcus
         4.128 Other specified bacterial
         4.129 Unspecified bacterial
   4.2 Viral
      4.21 Congenital viral
         4.211 Cytomegalovirus
         4.213 Herpes simplex virus
         4.214 Rubella virus
         4.218 Other specified viral
         4.219 Unspecified viral
      4.22 Acquired viral
         4.221 Cytomegalovirus
         4.223 Herpes simplex virus
         4.224 Rubella virus
         4.228 Other specified viral
         4.229 Unspecified viral
4.3 Protozoal e.g. Toxoplasma
4.5 Fungal
4.8 Other specified organism
4.9 Unspecified organism

5. Neurological
5.1 Hypoxic ischaemic encephalopathy / Perinatal asphyxia (typically infants of >24 weeks gestation or >600g birthweight)
5.2 Intracranial haemorrhage
   5.21 Intraventricular Haemorrhage
   5.22 Subgaleal Haemorrhage
   5.23 Subarachnoid Haemorrhage
   5.24 Subdural Haemorrhage
   5.28 Other Intracranial Haemorrhage
5.8 Other

6. Gastrointestinal
6.1 Necrotising enterocolitis
6.8 Other

7. Other
7.1 Sudden Infant Death Syndrome (SIDS)
   7.11 SIDS Category IA: Classic features of SIDS present and completely documented.
   7.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.
   7.13 SIDS Category II: Infant deaths that meet category I except for one or more features.
7.2 Multisystem failure
   7.21 Secondary to intrauterine growth restriction
   7.28 Other specified
   7.29 Unspecified/undetermined primary cause or trigger event
7.3 Trauma
   7.31 Accidental
   7.32 Non accidental
   7.39 Unspecified
7.4 Treatment complications
   7.41 Surgical
   7.42 Medical
7.8 Other specified
7.9 Unknown/Undetermined
   7.91 Unclassified Sudden Infant Death
   7.92 Other Unknown/Undetermined
7.5 PSANZ Classification Guide

7.5.1 PSANZ-PDC Classification Guide

1. Congenital abnormality (including terminations for congenital abnormalities)
   1.1 Central nervous system
   1.2 Cardiovascular system
   1.3 Urinary system
   1.4 Gastrointestinal system
   1.5 Chromosomal
   1.6 Metabolic
   1.7 Multiple/non chromosomal syndromes
   1.8 Other congenital abnormality
      1.81 Musculoskeletal
      1.82 Respiratory
      1.83 Diaphragmatic hernia
      1.84 Haematological
      1.85 Tumours
      1.88 Other specified congenital abnormality
   1.9 Unspecified congenital abnormality

Please note that terminations of pregnancy for perinatal deaths within this category should be identified by the inclusion of an “09” for two-digit codes and a “9” for the three digit codes

This category includes deaths in which a congenital abnormality, whether structural, functional or chromosomal, is considered to have made a major contribution, even though the abnormality may not always be lethal. It includes terminations of pregnancy ≥20 weeks undertaken because of congenital abnormalities, even if they are not considered to be lethal abnormalities.

If fetal hydrops is associated with congenital abnormalities, e.g. with pulmonary hypoplasia or multiple abnormalities, it is classified here under subcategory 1.7 Multiple/non chromosomal syndromes. If fetal hydrops is the result of cardiac failure from congenital heart disease, it is classified here under subcategory 1.2 Cardiovascular system. If it occurs in isolation and the cause is unknown, classify under Specific Perinatal Conditions, subcategory 6.7 Idiopathic hydrops.

Category 1.84 Haematological includes deaths due to congenital haematological abnormalities, such as thalassemia; Category 1.85 Tumours includes congenital tumours including cystic hygroma; and Category 1.88 Other specified congenital abnormality is used to classify identified abnormalities which are not included in Categories 1.1 to 1.85. Category 1.9 Unspecified congenital abnormality includes cases where there is an obvious abnormality but the investigation is incomplete and is therefore unknown or unspecified.

2. Perinatal infection
   2.1 Bacterial
      2.11 Group B Streptococcus
      2.12 E coli
      2.13 Listeria monocytogenes
      2.14 Spirochaetal, e.g. Syphilis
      2.18 Other bacterial
      2.19 Unspecified bacterial
   2.2 Viral
      2.21 Cytomegalovirus
      2.22 Parvovirus
      2.23 Herpes simplex virus
      2.24 Rubella virus
      2.28 Other viral
      2.29 Unspecified viral
   2.3 Protozoal, e.g. Toxoplasma
   2.5 Fungal
   2.8 Other specified organism
   2.9 Other unspecified organism

This category includes (i) primary infections occurring in term and preterm neonatal and fetal deaths and (ii) secondary infections e.g. following ≥24 hours of membrane rupture before delivery, resulting in neonatal early onset infection (within 48 hours of birth) in term infants. Deaths in preterm infants from
such secondary infection would be classified under the *Spontaneous Preterm* group, subcategory 9.2, and in this situation, the hierarchical system for categories would not apply. Category 2.8 *Other specified organism* includes deaths due to other identified organisms other than those in Categories 2.1 to 2.5. Category 2.9 *Other unspecified organism* includes cases where there is an obvious infection however the organism was either not identified or not specified.

In order to qualify for this category, there must be evidence of fetal or neonatal infection as described in Table 1. Determination of perinatal infection.

**Examples:**

**Classify here:** Term prelabour rupture of the membranes, delivery following \( \geq 24 \) hours of membrane rupture, neonatal pneumonia identified within 48 hours of birth, subsequent neonatal death, group B Streptococcus identified on vaginal culture and in gastric aspirate. Classify as subcategory 2.11.

**Do not classify here:** Neonatal death from late onset (\( \geq 48 \) hrs of age) Group B Streptococcal disease. Classify under No Obstetric Antecedent (subcategory 11.2).

**Classify here:** Spontaneous rupture of membranes, followed by spontaneous labour at 26 weeks and delivery of a stillborn baby. Membranes were ruptured for 12 hours prior to delivery. Fetal pneumonia was detected at autopsy and growth of E Coli from the lungs. Classify 2.12.

**Do not classify here:**

- Spontaneous rupture of the membranes at 24 weeks gestation. Clinical chorioamnionitis ensued after 4 days of membrane rupture. Induction of labour was undertaken resulting in a vaginal delivery of a liveborn infant. Birthweight was 650gms and Apgars scores were 2 at 1 minute and at 5 mins. Despite active resuscitation the infant died at 15 minutes of age. No autopsy or placental pathology was undertaken. Cord blood cultures grew E coli. Classify as PSANZ-PDC 9.23 and PSANZ-NDC 4.11.

Table 1. Determination of perinatal infection

<table>
<thead>
<tr>
<th>DEATH TYPE</th>
<th>CRITERIA OF INFECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetal</td>
<td>1. Histological confirmation of infection in cord (funisitis) or fetus (pneumonitis or pneumonia) with or without microbiological evidence of infection. OR 2a. Convincing clinical evidence of primary maternal infection AND 2b. Positive culture of a pathogen from mother or placenta</td>
</tr>
<tr>
<td>Neonatal</td>
<td>Congenital infection</td>
</tr>
<tr>
<td></td>
<td>Early onset infection (within 48 hours of birth), defined as:</td>
</tr>
<tr>
<td></td>
<td>1. Clinical signs in neonate consistent with sepsis</td>
</tr>
<tr>
<td></td>
<td>AND 2. Haematological changes consistent with sepsis</td>
</tr>
<tr>
<td></td>
<td>AND ONE OR MORE OF 3a – 3d</td>
</tr>
<tr>
<td></td>
<td>3a. Positive culture of a pathogen (bacterial or viral) from the neonate</td>
</tr>
<tr>
<td></td>
<td>OR 3b. Pathological evidence at autopsy</td>
</tr>
<tr>
<td></td>
<td>OR 3c. Positive serology</td>
</tr>
<tr>
<td></td>
<td>OR 3d. Positive culture of a pathogen from the mother or the placenta.</td>
</tr>
<tr>
<td></td>
<td>NB. Some congenital viral infections may have onset later than 48 hours after birth. For neonatal deaths occurring within a few hours of birth, especially those for which resuscitation was not attempted, where infection is presumed to be the cause of death, the infection criteria for fetal death may be used.</td>
</tr>
</tbody>
</table>
3. Hypertension
   3.1 Chronic hypertension: essential
   3.2 Chronic hypertension: secondary, e.g. renal disease
   3.3 Chronic hypertension: unspecified
   3.4 Gestational hypertension
   3.5 Pre-eclampsia
      3.51 With laboratory evidence of thrombophilia
   3.6 Pre-eclampsia superimposed on chronic hypertension
      3.61 With laboratory evidence of thrombophilia
   3.9 Unspecified hypertension

This category includes deaths where the hypertensive disorder is considered the factor initiating the chain of events leading to the death. If placental abruption complicates a hypertensive disorder, the death is classified here, as the abruption is attributed to the hypertensive disorder. This category excludes the circumstance when the hypertension is secondary to an underlying systemic disorder, e.g. Diabetes, where this is severe and uncontrolled (in which case, classify as subcategory 5.2 Diabetes, under Maternal Conditions). However, if the systemic disorder such as diabetes or gestational diabetes is mild or well controlled, and the death appeared to be due to hypertension or its complications, classify in this category. This category also includes hypertension secondary to renal disease as this often presents first with hypertension.

Thus, although the numbering of main groups of causes of death is in a hierarchical order in general, in some cases, as in the relationship between Maternal Conditions and Hypertension or APH, this hierarchy may not always apply, and each case needs to be classified according to its own particular circumstances.

The classification of Hypertension follows that of the Australasian Society for the Study of Hypertension in Pregnancy with the exceptions that unspecified subcategories have been included. The definitions also follow those in the consensus statement, which should be referred to whenever any classification difficulties arise:

Hypertension is diagnosed when the systolic blood pressure is \( \geq 140 \) mm Hg and /or diastolic blood pressure (Korotkoff V) is \( \geq 90 \) mm Hg. These blood pressures should be confirmed by repeated readings over several hours in a clinic or day assessment unit or after rest in hospital.

Gestational hypertension is defined as hypertension arising in pregnancy after 20 weeks gestation without any other feature of the multisystem disorder pre-eclampsia and which resolves within 3 months postpartum.

Pre-eclampsia may be defined as hypertension arising after 20 weeks gestation and the onset after 20 weeks gestation of one or more of: proteinuria, renal insufficiency, liver disease, neurological problems, haematological disturbances, fetal growth restriction. The hypertension will have returned to normal within 3 months postpartum.

With recent increasing interest in thrombophilic conditions, the 4\(^{th}\) digit or second decimal point is used for associations of thrombophilia with pre-eclampsia, i.e. subcategories 3.51 and 3.61. There should be laboratory (biochemical or haematological) evidence of thrombophilia to warrant inclusion. Due to the rapidly unfolding area of thrombophilia in pregnancy, the Special Interest Group had some difficulty developing a definition for laboratory (biochemical or haematological) evidence of thrombophilia. A working party of the SIG has been formed to develop a definition appropriate for inclusion in the classification guide in the future.
4. Antepartum Haemorrhage (APH)
   4.1 Placental abruption
       4.11 With laboratory evidence of thrombophilia
   4.2 Placenta praevia
   4.3 Vasa praevia
   4.8 Other APH
   4.9 APH of undetermined origin

This category includes all perinatal deaths where the primary factor leading to the death was an APH. If abruption occurs as a complication of a hypertensive disorder, the death is attributed to the hypertensive disorder (Category 3).

With recent increasing interest in thrombophilic conditions, the 4th digit or second decimal point can be used to identify associations of thrombophilia with antepartum haemorrhage, i.e. subcategory 4.11. There should be laboratory (biochemical or haematological) evidence of thrombophilia to warrant inclusion.

5. Maternal conditions
   5.1 Termination of pregnancy for maternal psychosocial indications
   5.2 Diabetes / Gestational diabetes
   5.3 Maternal injury
       5.31 Accidental
       5.32 Non-accidental
   5.4 Maternal sepsis
   5.5 Antiphospholipid Syndrome
   5.6 Obstetric cholestasis
   5.8 Other specified maternal conditions

This category includes deaths attributed to any medical or surgical disorder in the mother, or to its complications or treatment, excluding hypertensive disorders. The subcategory 5.1 includes terminations of pregnancy undertaken for any other indication than congenital abnormality; a termination of pregnancy undertaken because of congenital abnormality would be classified under Congenital Abnormality, Category 1.

Renal disease is not included as a separate subcategory here, but under Hypertension, subcategory 3.2, as it usually presents first as hypertension. Maternal conditions should only be attributed here if there is a high probability that they were the cause of death, e.g. a well-documented history of lupus obstetric syndrome with a previous stillbirth. Substance abuse may also be included under subcategory 5.8 Other specific maternal condition if there is a significant history of abuse and the fetal or neonatal death is believed to have been caused by the abuse.

Example:
Classify here: Fetal death as a result of severe uncontrolled Type I Diabetes with mild pre-eclampsia classify as subcategory 5.2, rather than Hypertension Category 3.
6. Specific perinatal conditions

6.1 Twin-twin transfusion
6.2 Fetomaternal haemorrhage
6.3 Antepartum cord complications
   6.31 Cord haemorrhage
   6.32 True knot with evidence of occlusion
   6.38 Other
   6.39 Unspecified
6.4 Uterine abnormalities, e.g. bicornuate uterus, cervical incompetence
6.5 Birth trauma (typically infants of >24 weeks gestation or >600g birthweight)
6.6 Alloimmune disease
   6.61 Rhesus
   6.62 ABO
   6.63 Kell
   6.64 Alloimmune thrombocytopenia
   6.68 Other
   6.69 Unspecified
6.7 Idiopathic hydrops
6.8 Other specific perinatal conditions
   6.81 Rupture of membranes after amniocentesis
   6.82 Termination of pregnancy for suspected but unconfirmed congenital abnormality,
   6.83 Fetal subdural haematoma
   6.88 Other
6.9 Unspecified

This category includes deaths of normally formed, appropriately grown babies in which the specific perinatal condition made a major contribution. Cord complications during labour should be categorised under Hypoxic Peripartum Death, subcategory 7.1.

As preterm rupture of the membranes and preterm labour are often preceded by premature cervical dilatation as a result of subclinical infection, the subcategory of cervical incompetence should be reserved for those rare circumstances where the clinical history and ultrasound scanning unequivocally point to pre-existing damage to the cervix from a surgical procedure or to congenital structural abnormality (as in some cases of DES exposure). Thus, there should be convincing evidence from the previous obstetric history and/or the state of the cervix, whether or not a cervical suture has been inserted.

Category 6.3.2 True knot with evidence of occlusion

A cord knot is where the cord becomes tangled with itself (or another cord in a multiple pregnancy) such that the vessels of the cord may be compromised. To be considered significant there should be evidence of congestion of haemorrhage in the cord, and/or changes in the placenta such as fetal vessel thrombosis or villous oedema to suggest vascular compromise. A knot could cause death without these changes but not every knot causes fetal compromise and therefore should not be accepted as a cause of death without further evidence as above, or strong clinical suspicion by the delivering clinician based on CTG or other changes during delivery.

Cord accidents usually only account for a few percent of perinatal deaths.

Category 6.5: Birth trauma includes infants with evidence of significant trauma at autopsy (e.g. tentorial tears, skull fracture), typically those of >24 weeks gestation or >600g birthweight.

Example: Do not classify here: Spontaneous prelabour rupture of membranes (ROM) at 33 weeks, with immediate cord prolapse and fetal death. Categorise as Spontaneous Preterm Category 9 as the cord complication occurred as a result of the preterm ROM.
7. Hypoxic peripartum death (typically infants of >24 weeks gestation or >600g birthweight)

7.1 With intrapartum complications
7.11 Uterine rupture
7.12 Cord prolapse
7.13 Shoulder dystocia
7.18 Other

7.2 Evidence of non-reassuring fetal status in a normally grown infant (e.g. abnormal fetal heart rate, fetal scalp pH/lactate, fetal pulse oximetry without intrapartum complications)

7.3 No intrapartum complications and no evidence of non-reassuring fetal status

7.9 Unspecified hypoxic peripartum death.

This category includes deaths from acute or chronic hypoxia of normally formed babies, typically of >24 weeks gestation or >600g birthweight. For subcategories 7.2 to 7.9, the presence of fetal growth restriction (FGR) overrides this classification and, if present, the death should be classified under FGR, Category 8.

This category includes deaths where the fetus was alive at the onset of labour, during which there may have been intrapartum complications (subcategory 7.1), or no intrapartum complications but with evidence of non-reassuring fetal status in a normally grown infant (subcategory 7.2), or no intrapartum complications or evidence of non-reassuring fetal status (subcategory 7.3). If there was no labour, and there were no apparent complications, the death would be classified in either subcategory 7.2 or 7.3. A specific major intrapartum complication, such as uterine rupture, cord prolapse or shoulder dystocia, is required for inclusion as subcategory 7.1. However, if there were no apparent intrapartum complications (as defined in category 7.1) but there was fetal growth restriction (FGR), then the death should be attributed to FGR, Category 8.

If there is insufficient information about fetal wellbeing or intrapartum complications, classify as subcategory 7.9 Unspecified hypoxic peripartum death.

Neonatal deaths as a result of hypoxic ischaemic encephalopathy\(^4,5\) and otherwise unexplained severe cardiorespiratory depression at birth are included here. Where possible, evidence for intrapartum hypoxia should include fetal, umbilical artery or early neonatal (within one hour) blood gases showing evidence of a severe metabolic acidosis. Otherwise peripartum death might also be due to non-hypoxic causes, e.g. infection or chronic ischaemia but wrongly assumed to be due to acute hypoxia.

The term ‘non-reassuring fetal status’ has been used in preference to the term ‘fetal distress’ as ‘clinical signs often poorly predict a compromised fetus and continued use of this latter term may encourage wrong assumptions or inappropriate management’\(^3,4\).

Examples:

Classify here: No known problems prior to labour at gestation 38 weeks. Severe fetal heart rate decelerations in second stage of labour. Baby is born with no signs of life with a birthweight of 3500gm. Classify as subcategory 7.2.

Classify here: No known problems prior to labour at 36 weeks. No FGR. No evidence of intrapartum fetal distress. At delivery, the baby shows signs of severe respiratory depression and hypoxia. Subsequently develops encephalopathy and multiorgan failure and dies on Day 10 of life. Classify as subcategory 7.3.
8. Fetal Growth Restriction (FGR)

8.1 With evidence of reduced vascular perfusion on Doppler studies and/or placental histopathology (e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
8.2 With chronic villitis
8.3 No placental pathology
8.4 No examination of placenta
8.8 Other specified placental pathology
8.9 Unspecified or not known whether placenta examined

This category includes deaths of babies with birthweight <10th percentile for gestational age for livebirths or non macerated stillbirths, or for all perinatal deaths where repeated antenatal ultrasound measurements have already shown growth restriction or growth arrest before death. This category excludes perinatal deaths with FGR as a result of an identified maternal or fetal condition where the death is classified according to the condition.

In the situation of a macerated stillbirth with suspected Small for Gestational Age (SGA) but without prior antenatal ultrasound evidence of FGR, a brain:liver ratio equal to or greater than 4:1 at autopsy is required for classification of FGR. For macerated stillbirths, in the absence of prior ultrasound evidence of FGR and where no autopsy has been performed or the brain:liver ratio is less than 4:1, the death should be classified as *Unexplained Antepartum Death* (Category 10), as the weight discrepancy may be a post mortem effect.

Customised birthweight centiles (CBW) are being increasingly used to more accurately determine the presence of FGR. It is recommended that the variables required for calculation of CBW (maternal age, ethnicity, height, weight, and fetal gestation and gender) be routinely collected to enable calculation of FGR according to CBW centiles. It is also recommended that for fetal deaths, where possible, the date of death and not date of birth be used to define the presence of FGR.

The subcategory 8.8 *Other specified placental pathology* is used when placental pathology other than that described in the subcategories 8.1 or 8.2 is present. The subcategory 8.9 *Unspecified or not known whether placenta examined* is used when information is not available on whether placental pathology was undertaken or where there is insufficient information about the placental pathology to categorise elsewhere.

**Examples:**

*Do not classify here:* A woman with an uncomplicated pregnancy presents with no fetal movements for 2 days at 34 weeks gestation, with no labour and intact membranes. An ultrasound scan confirms an intrauterine fetal death. Labour begins spontaneously after 4 days and a macerated female infant is born 12 hours later weighing 1500gms (<5th centile for 34 weeks). An autopsy is undertaken which did not reveal a cause for the death, a brain:liver ratio was not available. The histopathological report on the placenta stated that small areas of infarction were present but were not considered to be an explanation for the death. Further maternal investigations failed to identify a cause for the death. Classify as *Unexplained Antepartum Death: Other placental pathology* subcategory 10.8.
9. Spontaneous preterm (<37 weeks gestation)

9.1 Spontaneous preterm with intact membranes, or membrane rupture <24 hours before delivery
9.11 With chorioamnionitis on placental histopathology
9.12 Without chorioamnionitis on placental histopathology
9.13 With clinical evidence of chorioamnionitis, no examination of placenta
9.17 No clinical signs of chorioamnionitis, no examination of placenta
9.19 Unspecified or not known whether placenta examined

9.2 Spontaneous preterm with membrane rupture ≥24 hours before delivery
9.21 With chorioamnionitis on placental histopathology
9.22 Without chorioamnionitis on placental histopathology
9.23 With clinical evidence of chorioamnionitis, no examination of placenta
9.27 No clinical signs of chorioamnionitis, no examination of placenta
9.29 Unspecified or not known whether placenta examined

9.3 Spontaneous preterm with membrane rupture of unknown duration before delivery
9.31 With chorioamnionitis on placental histopathology
9.32 Without chorioamnionitis on placental histopathology
9.33 With clinical evidence of chorioamnionitis, no examination of placenta
9.37 No clinical signs of chorioamnionitis, no examination of placenta
9.39 Unspecified or not known whether placenta examined

Deaths of normally formed, appropriately grown preterm babies following spontaneous onset of preterm labour or spontaneous rupture of membranes, irrespective of induction of labour or mode of delivery (e.g. elective caesarean section). There should be no evidence of fetal or neonatal infection (see Table 1 Determination of perinatal infection) among those with membranes ruptured less than 24 hours, otherwise classify under Category 2 Perinatal Infection. Careful examination of the placenta macroscopically and microscopically is recommended. The diagnosis of placental evidence of chorioamnionitis should only be made when there is histological or microbiological evidence of inflammation or infection of the placenta and membranes.

In cases where there is placental evidence of chorioamnionitis with or without evidence of clinical chorioamnionitis classify as subcategory 9.11, 9.21 or 9.31 as appropriate. Clinical evidence of chorioamnionitis is defined as maternal fever (≥38 °C) associated with one or more of the following symptoms or signs: maternal or fetal tachycardia, uterine tenderness, malodorous amniotic fluid, and maternal leukocytosis or raised C-reactive protein. In cases of clinical chorioamnionitis where placental pathological examination was not performed or it is not known whether the placenta was examined, classify as subcategory 9.13, 9.23 or 9.33 as appropriate.

There may be some bleeding at the time of onset of labour, or earlier in pregnancy, but not in amounts to warrant the antecedent cause being attributed to Antepartum Haemorrhage Category 4.

Examples:

Classify here: Spontaneous labour at 26 weeks, no apparent explanation, and membranes intact. Vaginal delivery after 6 hours of membrane rupture, no evidence of intrapartum hypoxia or chorioamnionitis; subsequent early neonatal death from respiratory distress syndrome. Classify here as subcategory 9.12 Without chorioamnionitis on placental histopathology.


10. Unexplained antepartum death

10.1 With evidence of reduced vascular perfusion on Doppler studies and/or placental histopathology (e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
10.2 With chronic villitis
10.3 No placental pathology
10.4 No examination of placenta
10.8 Other specified placental pathology
10.9 Unspecified or not known whether placenta examined
This category includes deaths of normally formed fetuses prior to the onset of labour where no predisposing factors are considered likely to have caused the death e.g. Fetal Growth Restriction or any other primary complication such as spontaneous preterm rupture of the membranes. The subcategory 10.8 Other specified placental pathology is used when other placental pathology is present, other than that included elsewhere (categories 10.1, 10.2). Subcategory 10.9 Unspecified or not known whether placenta examined is used to classify deaths fulfilling the criteria for this category where it is not known either whether the placenta was examined or if the placenta was examined, the results of this examination.

Examples:
Classify here: Intrauterine Fetal Death (IUFD) at 27 weeks, with membranes intact, before onset of labour, no explanation. No autopsy or examination of placenta. Classify as Unexplained Antepartum Death, subcategory 10.4.

Do not classify here: Spontaneous ROM at 27 weeks, no significant maternal conditions present, subsequent IUFD prior to onset of labour. No chorioamnionitis on examination of the placenta. Classify as subcategory 9.32 Spontaneous Preterm.

11. No obstetric antecedent
11.1 Sudden Infant Death Syndrome (SIDS) (See appendix p130)
   11.11 SIDS Category IA: Classic features of SIDS present and completely documented.
   11.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.
   11.13 SIDS Category II: Infant deaths that meet Category I except for one or more features.

11.2 Postnatally acquired infection
11.3 Accidental asphyxiation
11.4 Other accident, poisoning or violence (postnatal)
11.8 Other specified
11.9 Unknown/Undetermined
   11.91 Unclassified Sudden Infant Death
   11.92 Other Unknown/Undetermined

Subcategories 11.1 SIDS and 11.91 Unclassified Sudden Infant Death are defined according to the new SIDS classification system by Krous et al\(^{(12)}\). This classification system provides a broad overall definition of SIDS which is then subcategorised on the basis of specific epidemiological features and the amount of information available (Please see below). Subcategory 11.92 Other Unknown/Undetermined has been included to identify unknown causes of death which do not fulfil the criteria of Category 11.91.

Subcategory 11.4 Other accident, poisoning or violence (postnatal) excludes cases of antepartum deaths which should be classified in Category 5 Maternal Conditions under subcategory 5.3 Maternal injury. Subcategory 11.8 Other specified is used to classify other identified conditions which are not included in subcategories 11.1 to 11.4.

Definitional approach to Sudden Infant Death\(^{(12)}\)

General Definition of SIDS
SIDS is defined as the sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history.

Category IA SIDS: Classic Features of SIDS Present and Completely Documented
Category IA includes infant deaths that meet the requirements of the general definition and also all of the following requirements.

Clinical
- More than 21 days and <9 months of age.
- Normal clinical history, including term pregnancy (gestational age of \(\geq\) 37 weeks).
- Normal growth and development.
No similar deaths among siblings, close genetic relatives (uncles, aunts or first-degree cousins), or other infants in the custody of the same caregiver.

**Circumstances of Death**
Investigation of the various scenes where incidents leading to death might have occurred and determination that they do not provide an explanation for the death.
Found in a safe sleeping environment, with no evidence of accidental death.

**Autopsy**
Absence of potentially fatal pathologic findings. Minor respiratory system inflammatory infiltrates are acceptable; intrathoracic petechial haemorrhage is a supportive but not obligatory or diagnostic finding.
No evidence of unexplained trauma, abuse, neglect, or unintentional injury.
No evidence of substantial thymic stress effect (thymic weight of <15g and/or moderate/severe cortical lymphocyte depletion). Occasional “starry sky” macrophages or minor cortical depletion is acceptable.
Negative results of toxicologic, microbiologic, radiologic, vitreous chemistry, and metabolic screening studies.

**Category IB SIDS: Classic Features of SIDS Present but Incompletely Documented**
Category IB includes infant deaths that meet the requirements of the general definition and also meet all of the criteria for category IA except that investigation of the various scenes where incidents leading to death might have occurred was not performed and or ≥ 1 of the following analyses was not performed: toxicologic, microbiologic, radiologic, vitreous chemistry, or metabolic screening studies.

**Category II SIDS**
Category II includes infant deaths that meet category I criteria except for ≥ 1 of the following.

**Clinical**
Age range outside that of category 1A or 1B (i.e., 0-21 days or 270 days [9 months] through first birthday).

Similar deaths among siblings, close relatives, or other infants in the custody of the same caregiver that are not considered suspect for infanticide or recognised genetic disorders.

Neonatal or perinatal conditions (for example, those resulting from preterm birth) that have resolved by the time of death.

**Circumstances of Death**
Mechanical asphyxia or suffocation caused by overlaying not determined with certainty.

**Autopsy**
Abnormal growth and development not thought to have contributed to death.
Marked inflammatory changes or abnormalities not sufficient to be unequivocal causes of death.

**Unclassified Sudden Infant Death**
The unclassified category includes deaths that do not meet the criteria for category I or II SIDS but for which alternative diagnoses of natural or unnatural conditions are equivocal, including cases for which autopsies were not performed.

**Post-resuscitation cases**
Infants found in extremis who are resuscitated and later die (“temporarily interrupted SIDS”) may be included in the aforementioned categories, depending on the fulfilment of relevant criteria.
7.5.2 PSANZ-NDC Classification Guide

The Neonatal Death Classification has been developed for use in conjunction with the PSANZ Classification of Perinatal Death in order to provide more comprehensive information on the factors in the neonatal period associated with neonatal deaths.

For example, a mother who has an antepartum haemorrhage at 32 weeks gestation delivers a 1500g infant which thrives in the neonatal nursery but subsequently acquires a lethal nosocomial infection: the obstetric antecedent is antepartum haemorrhage, but neonatal death classification is subcategory 4.12 Acquired Bacteria. Neonatal nosocomial infection is an important potentially preventable condition and its contribution to perinatal deaths may not be identified by applying the antecedent classification alone.

1. Congenital abnormality (including terminations for congenital abnormalities)
   1.1 Central nervous system
   1.2 Cardiovascular system
   1.3 Urinary system
   1.4 Gastrointestinal system
   1.5 Chromosomal
   1.6 Metabolic
   1.7 Multiple/non chromosomal syndromes
   1.8 Other congenital abnormality
      1.81 Musculoskeletal
      1.82 Respiratory
      1.83 Diaphragmatic hernia
      1.84 Haematological
      1.85 Tumours
      1.88 Other specified congenital abnormality
   1.9 Unspecified congenital abnormality

2. Extreme prematurity (typically infants of ≤24 weeks gestation or ≤600g birthweight)
   2.1 Not resuscitated
   2.2 Unsuccessful resuscitation
   2.9 Unspecified or unknown whether resuscitation attempted

This group includes infants deemed too immature for resuscitation or continued life support beyond the delivery room, typically infants of gestational age ≤24 weeks or birthweight ≤600g. Resuscitation in this context means the use of positive pressure ventilation.

3. Cardio-respiratory disorders
   3.1 Hyaline membrane disease / Respiratory Distress Syndrome (RDS)
   3.2 Meconium aspiration syndrome
   3.3 Primary persistent pulmonary hypertension
   3.4 Pulmonary hypoplasia
   3.5 Chronic neonatal lung disease (typically, bronchopulmonary dysplasia (BPD))
   3.6 Pulmonary haemorrhage
   3.7 Pneumothorax
   3.8 Other

Subcategory 3.1 Hyaline membrane disease / Respiratory Distress Syndrome (RDS) is used for deaths of infants who were receiving mechanical ventilation for acute RDS at the time of death or at the time of the complication such as pulmonary haemorrhage, sepsis or pneumothorax.

Neonates with resolving RDS, i.e. who are past the acute phase of the disease and are stable or improving, but who are still on low rate ventilation for immature lungs, extreme prematurity or apnoea, or who no longer require mechanical ventilation, and who developed a complication which led to the death should be classified according to that particular complication. For example, a non-ventilated neonate who dies of sepsis, is classified as Category 4 Infection.

Examples
   1. A 26 week gestation infant with RDS receives mechanical ventilation (SIPPV R50, P20/5, FiO2 0.4) develops complications of pneumothorax requiring drainage followed by a patent ductus arteriosus is classified as Category 3.1.
2. A 26 week gestation infant with RDS weaning off mechanical ventilator has a Grade IV Intraventricular Haemorrhage (IVH) with ventricular dilation on ultrasound on Day 5 is successfully weaned to CPAP on Day 7. He requires re-ventilation for sepsis on Day 10 and on Day 21 has developing BPD and post hemorrhagic hydrocephalus (PHH) and ventilation is withdrawn. Classification is dependent on the major reason for withdrawal of support. In this case PHH. Classify as 3.5.

Categorisation as chronic neonatal lung disease (subcategory 3.5) should be reserved for infants with deteriorating lung function and major chest X-ray changes consistent with bronchopulmonary dysplasia.

4. Infection

4.1 Bacterial

4.11 Congenital bacterial

4.111 Group B Streptococcus

4.112 E coli

4.113 Lysteria monocytogenes

4.114 Spirochaetal, eg syphilis

4.118 Other bacterial

4.119 Unspecified bacterial

4.12 Acquired bacterial

4.121 Group B Streptococcus

4.122 E coli

4.125 Other Gram negative bacilli (other than E coli)

4.126 Staphylococcus aureus

4.127 Coagulase negative Staphylococcus

4.128 Other specified bacterial

4.129 Unspecified bacterial

4.2 Viral

4.21 Congenital viral

4.211 Cytomegalovirus

4.213 Herpes simplex virus

4.214 Rubella virus

4.218 Other specified viral

4.219 Unspecified viral

4.22 Acquired viral

4.221 Cytomegalovirus

4.223 Herpes simplex virus

4.224 Rubella virus

4.228 Other specified viral

4.229 Unspecified viral

4.3 Protozoal e.g. Toxoplasma

4.5 Fungal

4.8 Other specified organism

4.9 Unspecified organism
Table 2. Determination of infection

<table>
<thead>
<tr>
<th>Determination of Infection</th>
</tr>
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<tbody>
<tr>
<td>A. Congenital</td>
</tr>
<tr>
<td>Early onset infection (within 48 hours of birth), defined as:</td>
</tr>
<tr>
<td>1. Clinical signs in neonate consistent with sepsis AND</td>
</tr>
<tr>
<td>2. Haematological changes consistent with sepsis AND</td>
</tr>
<tr>
<td>3a. Positive culture of a pathogen (bacterial or viral) from the neonate OR</td>
</tr>
<tr>
<td>3b. Pathological evidence at autopsy OR</td>
</tr>
<tr>
<td>3c. Positive serology OR</td>
</tr>
<tr>
<td>3d. Positive culture of a pathogen from the mother or the placenta.</td>
</tr>
<tr>
<td>NB: Some congenital viral infections may have onset later than 48 hours after birth.</td>
</tr>
<tr>
<td>B. Acquired</td>
</tr>
<tr>
<td>Onset of infection at 48 hours or later, with criteria as above, but excluding 3d.</td>
</tr>
</tbody>
</table>

5. Neurological

5.1 Hypoxic ischaemic encephalopathy / Perinatal asphyxia (typically infants of >24 weeks gestation or >600g birthweight)

5.2 Intracranial haemorrhage

5.21 Intraventricular Haemorrhage

5.22 Subgaleal Haemorrhage

5.23 Subarachnoid Haemorrhage

5.24 Subdural Haemorrhage

5.28 Other Intracranial Haemorrhage

5.8 Other

Inclusion as hypoxic ischaemic encephalopathy or perinatal asphyxia usually requires a sentinel asphyxial event +/- evidence of severe non-reassuring fetal status or early onset encephalopathy.

Examples of sentinel events (this would apply to infants typically of >24 weeks gestation or of >600g birthweight).

Massive antepartum haemorrhage from abruption, placenta praevia or ruptured vasa praevia, breech presentation or delivery with complications, e.g. cervical constriction ring or difficult delivery, feto-maternal haemorrhage, twin-twin transfusion.

Where possible, evidence for perinatal asphyxia should include fetal, umbilical artery or early neonatal (within one hour) blood gases showing evidence of a severe metabolic acidosis. Otherwise peripartum death might also be due to non-hypoxic causes, e.g. infection or chronic ischaemia but wrongly assumed to be due to acute hypoxia. On the absence of a sentinel asphyxial event every effort must be undertaken to exclude alternative diagnosis.

6. Gastrointestinal

6.1 Necrotising enterocolitis

6.8 Other
7. Other

7.1 Sudden Infant Death Syndrome (SIDS)

7.11 SIDS Category IA: Classic features of SIDS present and completely documented.

7.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.

7.13 SIDS Category II: Infant deaths that meet category I except for one or more features.

7.2 Multisystem failure

7.21 Secondary to intrauterine growth restriction

7.28 Other specified

7.29 Unspecified/undetermined primary cause or trigger event

7.3 Trauma

7.31 Accidental

7.32 Non accidental

7.39 Unspecified

7.4 Treatment complications

7.41 Surgical

7.42 Medical

7.8 Other specified

7.9 Unknown/Undetermined

7.91 Unclassified Sudden Infant Death

7.92 Other Unknown/Undetermined

The new classification for SIDS, by Krous et al\textsuperscript{11}, has been adopted as follows:

**Definitional approach to Sudden Infant Death**

**General Definition of SIDS**

SIDS is defined as the sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history.

**Category IA SIDS: Classic Features of SIDS Present and Completely Documented**

Category IA includes infant deaths that meet the requirements of the general definition and also all of the following requirements.

**Clinical**

- More than 21 days and <9 months of age.
- Normal clinical history, including term pregnancy (gestational age of $\geq$ 37 weeks).
- Normal growth and development.

No similar deaths among siblings, close genetic relatives (uncles, aunts or first-degree cousins), or other infants in the custody of the same caregiver.

**Circumstances of Death**

Investigation of the various scenes where incidents leading to death might have occurred and determination that they do not provide an explanation for the death. Found in a safe sleeping environment, with no evidence of accidental death.

**Autopsy**

Absence of potentially fatal pathologic findings. Minor respiratory system inflammatory infiltrates are acceptable; intrathoracic petechial haemorrhage is a supportive but not obligatory or diagnostic finding. No evidence of unexplained trauma, abuse, neglect, or unintentional injury. No evidence of substantial thymic stress effect (thymic weight of <15g and/or moderate/severe cortical lymphocyte depletion). Occasional “starry sky” macrophages or minor cortical depletion is acceptable. Negative results of toxicologic, microbiologic, radiologic, vitreous chemistry, and metabolic screening studies.
**Category IB SIDS: Classic Features of SIDS Present but Incompletely Documented**

Category IB includes infant deaths that meet the requirements of the general definition and also meet all of the criteria for category IA except that investigation of the various scenes where incidents leading to death might have occurred was not performed and or ≥ 1 of the following analyses was not performed: toxicologic, microbiologic, radiologic, vitreous chemistry, or metabolic screening studies.

**Category II SIDS**

Category II includes infant deaths that meet category I criteria except for ≥ 1 of the following.

**Clinical**
- Age range outside that of category 1A or 1B (i.e., 0-21 days or 270 days [9 months] through first birthday).
- Similar deaths among siblings, close relatives, or other infants in the custody of the same caregiver that are not considered suspect for infanticide or recognised genetic disorders.
- Neonatal or perinatal conditions (for example, those resulting from preterm birth) that have resolved by the time of death.

**Circumstances of Death**
- Mechanical asphyxia or suffocation caused by overlaying not determined with certainty.

**Autopsy**
- Abnormal growth and development not thought to have contributed to death.
- Marked inflammatory changes or abnormalities not sufficient to be unequivocal causes of death.

**Unclassified Sudden Infant Death**

The unclassified category includes deaths that do not meet the criteria for category I or II SIDS but for which alternative diagnoses of natural or unnatural conditions are equivocal, including cases for which autopsies were not performed.

**Postresuscitation Cases**

Infants found in extremis who are resuscitated and later die ("temporarily interrupted SIDS") may be included in the aforementioned categories, depending on the fulfilment of relevant criteria.
7.6 References:


Appendix 1: Changes - April 2009

The previous version of the classification is dated October 2004. This revision incorporates amendments to the PSANZ-PDC and PSANZ-NDC based on feedback received from users and discussion with the guideline working party which includes developers of the classification systems. The changes to previous version dated October 2004 are listed here. Previous changes made are listed at the end of this appendix.

1. Changes made in the March 2009 revision
1.1. PSANZ Perinatal Death Classification (PSANZ-PDC)
1.1.1 The inclusion of a code to identify terminations of pregnancy for congenital abnormality

<table>
<thead>
<tr>
<th>PSANZ-PDC version October 2004</th>
<th>PSANZ-PDC version April 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Congenital Abnormality (including terminations for congenital abnormalities)</td>
<td>1 Congenital Abnormality (including terminations for congenital abnormalities)</td>
</tr>
<tr>
<td>1.1 Central nervous system</td>
<td>1.1 Central nervous system</td>
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<tr>
<td>1.2 Cardiovascular system</td>
<td>1.2 Cardiovascular system</td>
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<tr>
<td>1.3 Urinary system</td>
<td>1.3 Urinary system</td>
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<tr>
<td>1.4 Gastrointestinal system</td>
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<tr>
<td>1.5 Chromosomal</td>
<td>1.5 Chromosomal</td>
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<tr>
<td>1.6 Metabolic</td>
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<tr>
<td>1.7 Multiple/non chromosomal syndromes</td>
<td>1.7 Multiple/non chromosomal syndromes</td>
</tr>
<tr>
<td>1.8 Other congenital abnormality</td>
<td>1.8 Other congenital abnormality</td>
</tr>
<tr>
<td>1.8.1 Musculoskeletal</td>
<td>1.8.1 Musculoskeletal</td>
</tr>
<tr>
<td>1.8.2 Respiratory</td>
<td>1.8.2 Respiratory</td>
</tr>
<tr>
<td>1.8.3 Diaphragmatic hernia</td>
<td>1.8.3 Diaphragmatic hernia</td>
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<tr>
<td>1.8.4 Haematological</td>
<td>1.8.4 Haematological</td>
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<tr>
<td>1.8.5 Tumours</td>
<td>1.8.5 Tumours</td>
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<tr>
<td>1.8.8 Other specified congenital abnormality</td>
<td>1.8.8 Other specified congenital abnormality</td>
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<tr>
<td>1.9 Unspecified congenital abnormality</td>
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</tr>
</tbody>
</table>

Please note that terminations of pregnancy for perinatal deaths within this category should be identified by the inclusion of an “09” for two-digit codes and a “9” for the three digit codes.

1.1.2 Change of wording for Category 5.5

<table>
<thead>
<tr>
<th>PSANZ-PDC version October 2004</th>
<th>PSANZ-PDC version April 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Maternal conditions</td>
<td>5 Maternal conditions</td>
</tr>
<tr>
<td>5.1 Termination of pregnancy for maternal</td>
<td>5.1 Termination of pregnancy for maternal</td>
</tr>
<tr>
<td>psychosocial indications</td>
<td>psychosocial indications</td>
</tr>
<tr>
<td>5.2 Diabetes / Gestational diabetes</td>
<td>5.2 Diabetes / Gestational diabetes</td>
</tr>
<tr>
<td>5.3 Maternal injury</td>
<td>5.3 Maternal injury</td>
</tr>
<tr>
<td>5.3.1 Accidental</td>
<td>5.3.1 Accidental</td>
</tr>
<tr>
<td>5.3.2 Non-accidental</td>
<td>5.3.2 Non-accidental</td>
</tr>
<tr>
<td>5.4 Maternal sepsis</td>
<td>5.4 Maternal sepsis</td>
</tr>
<tr>
<td>5.5 Lupus obstetric syndrome</td>
<td>5.5 Antiphospholipid syndrome</td>
</tr>
<tr>
<td>5.6 Obstetric cholestasis</td>
<td>5.6 Obstetric cholestasis</td>
</tr>
<tr>
<td>5.8 Other specified maternal conditions</td>
<td>5.8 Other specified maternal conditions</td>
</tr>
</tbody>
</table>
1.1.3 Addition of subcategories under Categories 6.3 and 6.8

<table>
<thead>
<tr>
<th>PSANZ-PDC version October 2004</th>
<th>PSANZ-PDC version February 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6 Specific perinatal conditions</strong></td>
<td><strong>6 Specific perinatal conditions</strong></td>
</tr>
<tr>
<td>6.1 Twin-twin transfusion</td>
<td>6.1 Twin-twin transfusion</td>
</tr>
<tr>
<td>6.2 Fetomaternal haemorrhage</td>
<td>6.2 Fetomaternal haemorrhage</td>
</tr>
<tr>
<td>6.3 Antepartum cord complications (e.g. cord haemorrhage; true knot with evidence of occlusion)</td>
<td>6.3 Antepartum cord complications</td>
</tr>
<tr>
<td>6.31 Cord haemorrhage</td>
<td>6.32 True knot with evidence of occlusion</td>
</tr>
<tr>
<td>6.39 Unspecified</td>
<td>6.38 Other</td>
</tr>
<tr>
<td>6.4 Uterine abnormalities, e.g. bicornuate uterus, cervical incompetence</td>
<td>6.4 Uterine abnormalities, e.g. bicornuate uterus, cervical incompetence</td>
</tr>
<tr>
<td>6.5 Birth trauma (typically infants of &gt;24 weeks gestation or &gt;600g birthweight)</td>
<td>6.5 Birth trauma (typically infants of &gt;24 weeks gestation or &gt;600g birthweight)</td>
</tr>
<tr>
<td>6.6 Alloimmune disease</td>
<td>6.6 Alloimmune disease</td>
</tr>
<tr>
<td>6.61 Rhesus</td>
<td>6.61 Rhesus</td>
</tr>
<tr>
<td>6.62 ABO</td>
<td>6.62 ABO</td>
</tr>
<tr>
<td>6.63 Kell</td>
<td>6.63 Kell</td>
</tr>
<tr>
<td>6.64 Alloimmune thrombocytopenia</td>
<td>6.64 Alloimmune thrombocytopenia</td>
</tr>
<tr>
<td>6.68 Other</td>
<td>6.68 Other</td>
</tr>
<tr>
<td>6.69 Unspecified</td>
<td>6.69 Unspecified</td>
</tr>
<tr>
<td>6.7 Idiopathic hydrops</td>
<td>6.7 Idiopathic hydrops</td>
</tr>
<tr>
<td>6.8 Other specific perinatal conditions (includes iatrogenic conditions such as rupture of membranes after amniocentesis, termination of pregnancy for suspected but unconfirmed congenital abnormality).</td>
<td>6.8 Other specific perinatal conditions</td>
</tr>
<tr>
<td>6.81 Rupture of membranes after amniocentesis</td>
<td>6.82 Termination of pregnancy for suspected but unconfirmed congenital abnormality,</td>
</tr>
<tr>
<td>6.83 Fetal subdural haematoma</td>
<td>6.83 Fetal subdural haematoma</td>
</tr>
<tr>
<td>6.88 Other</td>
<td>6.88 Other</td>
</tr>
<tr>
<td>6.89 Unspecified</td>
<td>6.89 Unspecified</td>
</tr>
</tbody>
</table>

1.1.4 Fetal growth restriction (FGR) Category 8 - customised birthweight centiles
A recommendation for the collection of data to determine FGR according to Customised birthweight centiles.(please see item 7.5.1.)

1.2 PSANZ Neonatal Death Classification (PSANZ-NDC)
1.2.1 Addition of new categories: 3.6 Pulmonary haemorrhage and 3.7 Pneumothorax

<table>
<thead>
<tr>
<th>PSANZ-NDC version October 2004</th>
<th>PSANZ-NDC version February 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 Cardio-respiratory disorders</strong></td>
<td><strong>3 Cardio-respiratory disorders</strong></td>
</tr>
<tr>
<td>3.1 Hyaline membrane disease / Respiratory Distress Syndrome (RDS)</td>
<td>3.1 Hyaline membrane disease / Respiratory distress syndrome (RDS)</td>
</tr>
<tr>
<td>3.2 Meconium aspiration syndrome</td>
<td>3.2 Meconium aspiration syndrome</td>
</tr>
<tr>
<td>3.3 Primary persistent pulmonary hypertension</td>
<td>3.3 Primary persistent pulmonary hypertension</td>
</tr>
<tr>
<td>3.4 Pulmonary hypoplasia</td>
<td>3.4 Pulmonary hypoplasia</td>
</tr>
<tr>
<td>3.5 Chronic neonatal lung disease (typically, bronchopulmonary dysplasia)</td>
<td>3.5 Chronic neonatal lung disease (typically, bronchopulmonary dysplasia)</td>
</tr>
<tr>
<td>3.8 Other</td>
<td>3.8 Other</td>
</tr>
</tbody>
</table>

1.2.1 Addition of new categories: 4.1 Congenital and 4.2 Acquired; Additional subcategories under Categories 4.1 and 4.2

<table>
<thead>
<tr>
<th>PSANZ-NDC version October 2004</th>
<th>PSANZ-NDC version February 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 Infection</strong></td>
<td><strong>4 Infection</strong></td>
</tr>
<tr>
<td>4.1 Bacterial</td>
<td>4.1 Bacterial</td>
</tr>
<tr>
<td>4.11 Congenital bacterial</td>
<td>4.11 Congenital bacterial</td>
</tr>
<tr>
<td>4.111 Group B Streptococcus</td>
<td>4.111 Group B Streptococcus</td>
</tr>
<tr>
<td>4.112 E coli</td>
<td>4.112 E coli</td>
</tr>
<tr>
<td>4.113 Lysteria monocytogenes</td>
<td>4.113 Lysteria monocytogenes</td>
</tr>
<tr>
<td>4.114 Spirochaetel, eg syphiilis</td>
<td>4.114 Spirochaetel, eg syphiilis</td>
</tr>
<tr>
<td>4.118 Other bacterial</td>
<td>4.118 Other bacterial</td>
</tr>
<tr>
<td>4.119 Unspecified bacterial</td>
<td>4.119 Unspecified bacterial</td>
</tr>
<tr>
<td>4.12 Acquired bacterial</td>
<td>4.12 Acquired bacterial</td>
</tr>
<tr>
<td>4.121 Group B Streptococcus</td>
<td>4.121 Group B Streptococcus</td>
</tr>
<tr>
<td>4.122 E coli</td>
<td>4.122 E coli</td>
</tr>
<tr>
<td>4.125 Other Gram negative bacilli (other)</td>
<td>4.125 Other Gram negative bacilli (other)</td>
</tr>
</tbody>
</table>
1.2.2 Additional subcategories under Category 5.2 Intracranial haemorrhage

<table>
<thead>
<tr>
<th>PSANZ-NDC version October 2004</th>
<th>PSANZ-NDC version February 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5. Neurological</strong></td>
<td><strong>5. Neurological</strong></td>
</tr>
<tr>
<td>5.1 Hypoxic ischaemic encephalopathy / Perinatal asphyxia (typically infants of &gt;24 weeks gestation or &gt;600g birthweight)</td>
<td>5.1 Hypoxic ischaemic encephalopathy / Perinatal asphyxia (typically infants of &gt;24 weeks gestation or &gt;600g birthweight)</td>
</tr>
<tr>
<td>5.2 Intracranial haemorrhage</td>
<td>5.2 Intracranial haemorrhage</td>
</tr>
<tr>
<td>5.8 Other</td>
<td>5.21 Intraventricular Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>5.22 Subgaleal Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>5.23 Subarachnoid Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>5.24 Subdural Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>5.28 Other Intracranial Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>5.8 Other</td>
</tr>
</tbody>
</table>

1.2.3 Addition of a new category – 7.4 Treatment complications; Additional subcategories under 7.2 and 7.3.

<table>
<thead>
<tr>
<th>PSANZ-NDC version October 2004</th>
<th>PSANZ-NDC version February 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7 Other</strong></td>
<td><strong>7 Other</strong></td>
</tr>
<tr>
<td>7.1 Sudden Infant Death Syndrome (SIDS)</td>
<td>7.1 Sudden Infant Death Syndrome (SIDS)</td>
</tr>
<tr>
<td>7.11 SIDS Category IA: Classic features of SIDS present and completely documented.</td>
<td>7.11 SIDS Category IA: Classic features of SIDS present and completely documented.</td>
</tr>
<tr>
<td>7.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.</td>
<td>7.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.</td>
</tr>
<tr>
<td>7.13 SIDS Category II : Infant deaths that meet category I except for one or more features.</td>
<td>7.13 SIDS Category II : Infant deaths that meet category I except for one or more features.</td>
</tr>
<tr>
<td>7.2 Multisystem failure-only if unknown primary cause or trigger event</td>
<td>7.2 Multisystem failure</td>
</tr>
<tr>
<td>7.3 Trauma</td>
<td>7.31 Accidental</td>
</tr>
<tr>
<td>7.8 Other specified</td>
<td>7.32 Non accidental</td>
</tr>
<tr>
<td>7.9 Unknown/Undetermined</td>
<td>7.39 Unspecified</td>
</tr>
<tr>
<td>7.91 Unclassified Sudden Infant Death</td>
<td>7.4 Treatment complications</td>
</tr>
<tr>
<td>7.92 Other Unknown/Undetermined</td>
<td>7.41 Surgical</td>
</tr>
<tr>
<td></td>
<td>7.42 Medical</td>
</tr>
<tr>
<td></td>
<td>7.8 Other specified</td>
</tr>
<tr>
<td></td>
<td>7.9 Unknown/Undetermined</td>
</tr>
<tr>
<td></td>
<td>7.91 Unclassified Sudden Infant Death</td>
</tr>
<tr>
<td></td>
<td>7.92 Other Unknown/Undetermined</td>
</tr>
</tbody>
</table>
2. Changes made in the October 2004 revision

1. Classification of associated factors
To enable consideration of factors associated with perinatal death, following classification of the main obstetric antecedent factor according to the PSANZ-PDC, and in addition for neonatal deaths the neonatal factor according to the PSANZ-NDC, it is now recommended that up to two associated factors, where present, be recorded using the classifications.

For example, when the death was due to placental abruption which was preceded by pre-eclampsia, according to the PSANZ-PDC, the death is classified as Hypertension - Pre-eclampsia (subcategory 3.5) and the associated factor is classified as Antepartum Haemorrhage Placental Abruption (subcategory 4.1).

2. Subcategories for Special Interest Groups: PDC and NDC
The subcategories in Addendums 1 and 2 for Special Interest Groups in the PSANZ-PDC and PSANZ-NDC version May 23rd 2003 have been removed from the guideline. These subcategories have been superseded by the incorporation of classifying associated factors as discussed in 1 above and the additional of subcategories within the classification (Please see Hypertension Category 3 and APH Category 4).

3. Minimum data set for perinatal deaths
The SIG has developed a recommended core dataset for the purpose of classification and reporting of perinatal deaths (see PSANZ Perinatal Mortality Audit Package Section 2; Appendix 1) is recommended for this purpose. It is hoped that the use of this core dataset will enhance the quality of perinatal audit and thus the value of analyses of perinatal mortality audit and research activities across ANZ.

4. Changes to the Perinatal Death Classification Categories

4.1 Congenital abnormality: Category 1.
Additional subcategories have been included under Category 1.8 Other congenital abnormality. These are: Category 1.84 Haematological for classification of deaths due to haematological abnormalities such as thalassemia; and Category 1.85 Tumours for classification of tumours which includes cystic hygroma. Subcategory 1.7 has been renamed to Multiple/non chromosomal syndromes. In addition, clarification of Categories 1.8 Other congenital abnormality and 1.9 Unspecified congenital abnormality has been included in the Classification Guide. Categories 1.3 Urinary tract and 1.4 Gastrointestinal tract have been renamed to Urinary system and Gastrointestinal system.

<table>
<thead>
<tr>
<th>PSANZ-PDC version May 23rd 2003</th>
<th>PSANZ-PDC version October 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Congenital Abnormality (including terminations for congenital abnormalities)</td>
<td>1. Congenital Abnormality (including terminations for congenital abnormalities)</td>
</tr>
<tr>
<td>1.1 Central nervous system</td>
<td>1.1 Central nervous system</td>
</tr>
<tr>
<td>1.2 Cardiovascular system</td>
<td>1.2 Cardiovascular system</td>
</tr>
<tr>
<td>1.3 Urinary tract</td>
<td>1.3 Urinary system</td>
</tr>
<tr>
<td>1.4 Gastrointestinal tract</td>
<td>1.4 Gastrointestinal system</td>
</tr>
<tr>
<td>1.5 Chromosomal</td>
<td>1.5 Chromosomal</td>
</tr>
<tr>
<td>1.6 Metabolic</td>
<td>1.6 Metabolic</td>
</tr>
<tr>
<td>1.7 Multiple</td>
<td>1.7 Multiple/ non chromosomal syndromes</td>
</tr>
<tr>
<td>1.8 Other congenital abnormality</td>
<td>1.8 Other congenital abnormality</td>
</tr>
<tr>
<td>1.81 Musculoskeletal</td>
<td>1.81 Musculoskeletal</td>
</tr>
<tr>
<td>1.82 Respiratory</td>
<td>1.82 Respiratory</td>
</tr>
<tr>
<td>1.83 Diaphragmatic hernia</td>
<td>1.83 Diaphragmatic hernia</td>
</tr>
<tr>
<td>1.88 Other specified congenital abnormality</td>
<td>1.88 Haematological</td>
</tr>
<tr>
<td>1.9 Unspecified congenital abnormality</td>
<td>1.85 Tumours</td>
</tr>
<tr>
<td></td>
<td>1.88 Other specified congenital abnormality</td>
</tr>
<tr>
<td></td>
<td>1.9 Unspecified congenital abnormality</td>
</tr>
</tbody>
</table>
### 2. Perinatal Infection

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacterial</strong></td>
<td>2.11 Group B Streptococcus</td>
</tr>
<tr>
<td></td>
<td>2.12 E coli</td>
</tr>
<tr>
<td></td>
<td>2.13 Listeria monocytogenes</td>
</tr>
<tr>
<td></td>
<td>2.19 Other unspecified bacterial</td>
</tr>
<tr>
<td><strong>Viral</strong></td>
<td>2.21 Cytomegalovirus</td>
</tr>
<tr>
<td></td>
<td>2.23 Herpes simplex virus</td>
</tr>
<tr>
<td></td>
<td>2.24 Rubella virus</td>
</tr>
<tr>
<td></td>
<td>2.29 Other unspecified viral</td>
</tr>
<tr>
<td><strong>Protozoal e.g. Toxoplasma</strong></td>
<td>2.23 Herpes simplex virus</td>
</tr>
<tr>
<td><strong>Spirochaetal e.g. Syphilis</strong></td>
<td>2.29 Other unspecified viral</td>
</tr>
<tr>
<td><strong>Fungal</strong></td>
<td>2.22 Parvovirus</td>
</tr>
<tr>
<td></td>
<td>2.24 Rubella virus</td>
</tr>
<tr>
<td></td>
<td>2.28 Other unspecified viral</td>
</tr>
</tbody>
</table>

### 4. Hypertension: Category 3

Two subcategories have been included to identify laboratory evidence of thrombophilia with pre-eclampsia (Subcategories 3.51 and 3.61). These categories were included in the previous version of the guideline in the Addendum for Special Interest Groups.

### 4. Antepartum Haemorrhage Category 4

An additional subcategory 4.11 has been included to identify laboratory evidence of thrombophilia with placental abruption. This category was previously included in the Addendum for Special Interest Groups.

### 4.5 Maternal conditions: Category 5.

Category 5.1 has been renamed to *Termination of pregnancy for maternal psychosocial indications.* Additional subcategories have been included as follows: 5.5 *Lupus obstetric syndrome* and 5.6 *Obstetric cholestasis* (previously classified under 5.8 *Other maternal conditions*).
### 4.6 Hypoxic peripartum death: Category 7
An additional subcategory has been included: 7.2 Evidence of non-reassuring fetal status in a normally grown infant (e.g. abnormal fetal heart rate, fetal scalp pH/lactate, fetal pulse oximetry without intrapartum complications). This category identifies hypoxic peripartum deaths where there was evidence of fetal distress in a normally grown infant without apparent intrapartum complications as defined in 7.1. A new subcategory 7.3 has been included to identify deaths where there are no apparent complications as defined in 7.1 and no evidence of non-reassuring fetal status as defined in 7.2.

In the circumstance of a growth restricted infant fulfilling the criteria for this category, the death should be classified as Category 8 Fetal Growth Restriction with the exception of deaths due to an intrapartum obstetric complication where the death should be classified as Category 7.1. The Classification Guide has been updated to incorporate these changes and also to clarify the application of Category 7.9 Unspecified hypoxic peripartum death.

### 4.7 Fetal Growth Restriction (FGR): Category 8
**Revised definition**
The definition of FGR in the case of a macerated stillborn infant with suspected Small for Gestational Age (SGA) and without prior antenatal ultrasound evidence of FGR has been revised to include infants with a brain: liver ratio of 4:1 at autopsy. Suspected Small for Gestational Age (SGA) macerated stillbirths without prior ultrasound evidence of FGR or brain: liver ratio of 4:1 at autopsy should be classified as *Unexplained Antepartum Death* (Category 10), as the weight discrepancy may be a postmortem effect. Customised centiles\(^2\) should be used in determining the presence of FGR, however, as yet data are not available to recommend their routine use in ANZ. It is also recommended that for fetal deaths, where possible, the date of death and not date of birth be used to define the presence of FGR.

The changes to subcategories are as follows:
Subcategory 8.1 description changed to include Doppler evidence; subcategory 8.3 new wording: *No placental pathology*; new subcategory 8.8 *Other placental pathology* is used when placental pathology as described in the subcategories 8.1 or 8.2 is not present.

Clarification of the use of subcategory 8.9 *Unspecified or not known whether placenta examined* has been included in the Classification Guide.
### 8. Fetal Growth Restriction (FGR)

8.1 With evidence of uteroplacental insufficiency e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction

8.2 With chronic villitis

8.3 Without the above placental pathology

8.4 No examination of placenta

8.9 Unspecified FGR or not known whether placenta examined

---

### 9. Spontaneous Preterm (<37 weeks gestation)

9.1 Spontaneous preterm with intact membranes, or membrane rupture <24 hours before delivery

9.11 With chorioamnionitis

9.12 Without chorioamnionitis

9.13 No examination of placenta

9.19 Unspecified or not known whether placenta examined

9.2 Spontaneous preterm with membrane rupture ≥24 hours before delivery

9.21 With chorioamnionitis

9.22 Without chorioamnionitis

9.23 No examination of placenta

9.3 Spontaneous preterm with membrane rupture of unknown duration before delivery,

9.31 With chorioamnionitis

9.32 Without chorioamnionitis

9.33 No examination of placenta

---

### 4.8 Spontaneous preterm: Category 9

Description change for subcategories 9.11, 9.21 and 9.31 to *With chorioamnionitis confirmed on placental histopathology* to clarify the need for placental confirmation of chorioamnionitis for this category; new subcategories 9.13, 9.23 or 9.33 for clinical chorioamnionitis where no placental histopathology is available; new subcategories 9.17, 9.27 and 9.37 *No clinical signs of chorioamnionitis, no examination of placenta.*

Clinical chorioamnionitis is defined as maternal fever (≥38°C) associated with one or more of the following symptoms or signs: maternal or fetal tachycardia, uterine tenderness, malodorous amniotic fluid, and maternal leukocytosis or raised C-reactive protein. Clarification on the use of subcategory 9.39 has been included in the Classification Guide.
4.9  **Unexplained antepartum death: Category 10**

Description change to subcategory 10.1 to include Doppler evidence of reduced vascular perfusion; subcategory 10.3 has been reworded; new subcategory 10.8 **Other placental pathology** is used when placental pathology as described in the subcategories 10.1 or 10.2 is not present; Category 10.9 description changed for clarity. Clarification of the use of subcategory 10.9 **Unspecified or not known whether placenta examined** has been included in the Classification Guide.

<table>
<thead>
<tr>
<th>PSANZ-PDC version May 23rd 2003</th>
<th>PSANZ-PDC version October 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10. Unexplained Antepartum Death</strong></td>
<td><strong>10. Unexplained Antepartum Death</strong></td>
</tr>
<tr>
<td>10.1 With evidence of uteroplacental insufficiency, e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction</td>
<td>10.1 With evidence of reduced vascular perfusion on Doppler studies and/or placental histopathology (e.g. significant infarction, acute atherosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)</td>
</tr>
<tr>
<td>10.2 With chronic villitis</td>
<td>10.2 With chronic villitis</td>
</tr>
<tr>
<td>10.3 Without the above placental pathology</td>
<td>10.3 No placental pathology</td>
</tr>
<tr>
<td>10.4 No examination of placenta</td>
<td>10.4 No examination of placenta</td>
</tr>
<tr>
<td>10.9 Unspecified unexplained antepartum death or not known whether placenta examined</td>
<td>10.8 Other specified placental pathology</td>
</tr>
<tr>
<td>10.9 Unspecified or not known whether placenta examined</td>
<td>10.9 Unspecified or not known whether placenta examined</td>
</tr>
</tbody>
</table>

4.10  **No obstetric antecedent: Category 11.**

Subcategories 11.1 **SIDS** and 11.91 **Unclassified Sudden Infant Death** are defined according to the new SIDS classification system by Krous et al.(17). This classification system provides a broad overall definition of SIDS which is then subcategorised on the basis of specific epidemiological features and the amount of information available ([Please see below](#)). Subcategory 11.92 **Other Unknown/Undetermined** has been included to identify unknown causes of death which do not fulfil the criteria of Category 11.92. An explanation of the categories is included in the Classification Guide.

In addition, subcategory 11.8 has been renamed to **Other specified** for clarity and includes classification of conditions which are not included in subcategories.

<table>
<thead>
<tr>
<th>PSANZ-PDC version May 23rd 2003</th>
<th>PSANZ-PDC version October 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>11. No Obstetric Antecedent</strong></td>
<td><strong>11. No Obstetric Antecedent</strong></td>
</tr>
<tr>
<td>11.1 SIDS</td>
<td>11.1 Sudden Infant Death Syndrome (SIDS)</td>
</tr>
<tr>
<td>11.11 Consistent with SIDS</td>
<td>11.11 SIDS Category IA: Classic features of SIDS present and completely documented.</td>
</tr>
<tr>
<td>11.12 Possible SIDS</td>
<td>11.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.</td>
</tr>
<tr>
<td>11.2 Postnatally acquired infection</td>
<td>11.13 SIDS Category II: Infant deaths that meet Category I except for one or more features.</td>
</tr>
<tr>
<td>11.3 Accidental asphyxiation</td>
<td>11.2 Postnatally acquired infection</td>
</tr>
<tr>
<td>11.4 Other accident, poisoning or violence (postnatal)</td>
<td>11.3 Accidental asphyxiation</td>
</tr>
<tr>
<td>11.8 Other</td>
<td>11.4 Other accident, poisoning or violence (postnatal)</td>
</tr>
<tr>
<td>11.9 Unknown / Unexplained</td>
<td>11.8 Other specified</td>
</tr>
<tr>
<td>11.9 Unspecified</td>
<td>11.9 Unknown/Undetermined</td>
</tr>
<tr>
<td>11.91 Unclassified Sudden Infant Death</td>
<td>11.91 Unclassified Sudden Infant Death</td>
</tr>
<tr>
<td>11.92 Other Unknown/Undetermined</td>
<td>11.92 Other Unknown/Undetermined</td>
</tr>
</tbody>
</table>

5.  **Changes to the Neonatal Death Classification Categories**

5.1  **Congenital abnormality: Category 1.**

Changes to subcategories have been made as for the Perinatal Death Classification.

5.2  **Other: Category 7.**

Changes to the classification of SIDS have been made as for the Perinatal Death Classification.
### Appendix 2a: Table 1. Birthweight percentile values (g) for live singleton males, Australia, 1991-1994

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From: Roberts CL & Lancaster PAL. Australian national birthweight percentiles by gestational age. MJA 1999; 170: 114-118.

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### Appendix 2a: Table 2. Birthweight percentile values (g) for live singleton females, Australia, 1991-1994

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### Appendix 2a: Table 3. Birthweight percentile values (g) for male twins, Australia, 1991-1994

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## Appendix 2a: Table 4. Birthweight percentile values (g) for female twins, Australia, 1991-1994

| Gestation (weeks) | No. births | Mean (g) | Standard Deviation | Percentile (g) 1st | 3rd | 5th | 10th | 25th | 50th | 75th | 90th | 95th | 97th | 99th |
|-------------------|------------|----------|---------------------|-------------------|-----|-----|------|------|------|------|------|------|------|------|------|
| 20                | 8          | 314      | 48                  | 310               |     |     |      |      |      |      |      |      |      |      |
| 21                | 19         | 517      | 401                 | 410               |     |     |      |      |      |      |      |      |      |      |
| 22                | 14         | 441      | 85                  | 455               |     |     |      |      |      |      |      |      |      |      |
| 23                | 30         | 552      | 93                  | 490 550 620      |     |     |      |      |      |      |      |      |      |      |
| 24                | 40         | 606      | 126                 | 530 570 680      |     |     |      |      |      |      |      |      |      |      |
| 25                | 46         | 689      | 100                 | 620 680 740      |     |     |      |      |      |      |      |      |      |      |
| 26                | 67         | 838      | 140                 | 680 750 830 910 1030 |     |     |      |      |      |      |      |      |      |      |
| 27                | 70         | 894      | 205                 | 575 790 940 1020 1135 |     |     |      |      |      |      |      |      |      |      |
| 28                | 111        | 1092     | 161                 | 780 860 1000 1110 1200 1280 1310 |     |     |      |      |      |      |      |      |      |      |
| 29                | 86         | 1171     | 206                 | 710 870 1080 1175 1310 1430 1500 |     |     |      |      |      |      |      |      |      |      |
| 30                | 137        | 1386     | 225                 | 960 970 1080 1250 1410 1530 1620 1720 1820 |     |     |      |      |      |      |      |      |      |      |
| 31                | 207        | 1507     | 242                 | 1000 1030 1170 1380 1520 1630 1800 1890 1900 |     |     |      |      |      |      |      |      |      |      |
| 32                | 322        | 1673     | 273                 | 980 1130 1200 1340 1520 1680 1850 2010 2090 2170 2370 |     |     |      |      |      |      |      |      |      |      |
| 33                | 400        | 1869     | 330                 | 1020 1195 1300 1440 1675 1865 2080 2280 2400 2455 2705 |     |     |      |      |      |      |      |      |      |      |
| 34                | 625        | 2058     | 307                 | 1240 1440 1530 1660 1870 2060 2260 2440 2550 2640 2810 |     |     |      |      |      |      |      |      |      |      |
| 35                | 907        | 2270     | 335                 | 1520 1620 1710 1860 2050 2270 2470 2720 2840 2940 3070 |     |     |      |      |      |      |      |      |      |      |
| 36                | 1463       | 2430     | 348                 | 1550 1760 1870 2010 2200 2430 2670 2860 2980 3090 3320 |     |     |      |      |      |      |      |      |      |      |
| 37                | 1910       | 2602     | 343                 | 1790 1950 2050 2170 2380 2600 2820 3050 3170 3260 3430 |     |     |      |      |      |      |      |      |      |      |
| 38                | 2165       | 2731     | 359                 | 1860 2050 2140 2270 2490 2740 2960 3190 3310 3400 3600 |     |     |      |      |      |      |      |      |      |      |
| 39                | 715        | 2850     | 373                 | 2020 2130 2200 2380 2600 2850 3110 3340 3440 3550 3700 |     |     |      |      |      |      |      |      |      |      |
| 40                | 359        | 2920     | 410                 | 2000 2100 2220 2390 2660 2920 3200 3420 3590 3750 3860 |     |     |      |      |      |      |      |      |      |      |
| 41                | 41         | 2826     | 469                 | 2540 2880 3090 2660 |     |     |      |      |      |      |      |      |      |      |
| 42                | 14         | 2684     | 277                 | 2660 |     |     |      |      |      |      |      |      |      |      |      |
| 43                | 2          | 2830     | 0                   | 2830 |     |     |      |      |      |      |      |      |      |      |      |
| 44                | 2          | 2665     | 290                 | 2665 |     |     |      |      |      |      |      |      |      |      |      |

Appendix 2b: Figure 1 Australian birthweight percentiles for singleton boys

Appendix 2b: Figure 2 Australian birthweight percentiles for singleton girls

Appendix 2b: Figure 3 Birthweight percentiles for male twins, Australia

Appendix 2b: Figure 4 Birthweight percentiles for female twins, Australia

Appendix 3: Contact details

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