**Perinatal Loss elearning audit/class section**

**Perinatal Mortality Audit and Classification**

**Objectives**

**Aim:**

To outline specific perinatal mortality audit processes.
To provide an understanding of the purpose and approaches to perinatal mortality classifications.

**Objectives:**

Following completion of this module you will be able to:

1. Understand the perinatal mortality audit process.
2. Understand the advantages of the PSANZ perinatal mortality classification system.
3. Know how to use the classification system and identify important factors associated with perinatal death.

**Perinatal Mortality Audit**

The following slides will examine the perinatal mortality audit system.

-Wandoona dam WA
The purpose of the perinatal mortality audit is to:

1. Provide a high quality review of circumstances surrounding the perinatal death.
2. Improve practice.
3. Improve the quality of data available.
4. Allow the monitoring and development of research activities aimed at reducing perinatal death.

Format:

1. A process for review of perinatal deaths should be developed in each institution/unit.
2. Principles of confidentiality and impartiality should be taken into account.
3. All perinatal deaths should be reviewed by a local area Perinatal Mortality Committee, in addition to the review performed on all deaths post 26 weeks gestation undertaken by the statewide PIMC [WA].
4. The local area Perinatal Mortality Committee may be linked/combined with other hospital committee/s or regional mortality review committee (particularly in smaller hospitals).
The purposes of the local area Perinatal Mortality Committee include:

1. The review of all stillbirths and neonatal deaths.
2. The classification of perinatal deaths according to the PSANZ system.
3. The evaluation of circumstances surrounding the death, including contributing factors.
4. The development of recommendations for improving care.
5. Ensuring feedback to clinicians.
6. Implementation of actions based on developed recommendations.
7. Completion and submission of the case summary to the relevant authorities.

The local Perinatal Mortality Committee should include a multidisciplinary team comprising:

- Obstetricians
- Paediatricians/Neonatologists
- Pathologists
- Midwives
- Neonatal nurses
- Social workers
- Other relevant medical specialists and allied health professionals.
- GP/GP Obstetrician

"Multidisciplinary involvement provides an opportunity for all members of the team providing care to participate in a comprehensive assessment of the standards of care and strategies for improvement where appropriate."
Hospital administrators have the responsibility of supporting perinatal mortality reporting and review, and of undertaking audit processes.

The aim of the local area Perinatal Mortality Committee is to:

- Provide an atmosphere of confidence and security.
- Encourage health care providers and managers to communicate openly and honestly with all members of the health care team.

"The review should take place as soon as possible after the death, once results of the core investigations are available." [1]

Conducting the review as early as possible allows:

- Events surrounding the death to be more easily remembered by the staff involved.
- Information from the review to be discussed with the parent(s) at their follow-up visit.
- Appropriate provision of information, feedback, counselling and support to staff.
- Timely implementation of recommendations.

If results of investigations are not available at the time of initial review, the case should remain on the agenda until completed. This allows finalisation of the cause of death and ensures appropriate follow-up.
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Cause of death and associated factors

The leading causes of stillbirth [WA] are:
1. Congenital Abnormality
2. Prematurity related to spontaneous preterm labour and birth.
3. ‘Unexplained’ (sometimes deaths not thoroughly investigated).

The leading causes of neonatal deaths [WA] are:
1. Prematurity.
2. Congenital abnormalities.
3. Perinatal infection.

WA has one of the highest perinatal autopsy rates in Australia (around 60%), and a lower proportion of unexplained stillbirths. [2]
The review should include consideration of the following three main contributing areas:

- Maternal/social factors.
- Infrastructure/service organisation.
- Professional care delivery.

AND further classified by the timing:

- Antenatal.
- Intrapartum.
- Neonatal.

The identification of contributing factors does not imply that the death could have been prevented, rather the risk of death may have been reduced. [1]

Worldwide 30-50% of stillbirths have identified sub-optimal care factors during review. [1]

"At the review of each perinatal death, consideration should be given to the adequacy of communication with parents and between health care professionals and the investigations undertaken." [1]

The following factors may lead to a sub-optimal investigation review [1]:

- Incomplete investigation of a stillbirth.
- Staff not discussing postmortem consent with parents.
- Lack of information concerning postmortem examination or alternative examinations.
- Postmortem discussion by inexperienced staff.
- Failure to undertake postmortem when requested.
- Incomplete postmortem report.
- Lack of bereavement support.
- Insensitive written communication.
Medical Record Factors:
2. Contemporaneous documentation.
3. Completed according to policy.

Death Certificate Factors:
1. Issued by the senior clinician responsible for the care.
2. May need to be reviewed/amended following the autopsy findings.
3. All details of the certificate are reviewed by the Perinatal Mortality Committee for accuracy.

Clinical Summary
1. Should be completed for all perinatal deaths.
2. Should be standardised.
3. Includes all significant family, medical, obstetric histories, pregnancy complications and investigations (see Module 2).

Click the link to access the PSANZ Clinical Summary.
[1]
Perinatal Loss elearning audit/class section

**Feedback to Clinicians:**
- Notification of death to General Practitioner and other care providers.
- Should include a comprehensive clinical summary.
- Hospital process/policy to facilitate clinician feedback should be in place.

**Feedback to Parent/s:**
- A follow-up multi-disciplinary consultation service should be provided to all parents.
- The follow-up should involve consultation with the clinician who provided care.
- In cases of genetic abnormalities it may be appropriate for referral/discussion with a genetic counsellor/geneticist.
- Further testing may be required dependent on initial results (e.g. thrombophilia).

At KEMH this is the “Perinatal Loss Service”. Appointments are scheduled approximately 8 weeks following the death.

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**Role of the Statewide Perinatal and Infant Mortality Committee [WA]**

1. Statutory requirement under the Health Act 1911. [4]
2. Membership comprises of a panel of experts.
3. Meetings are held monthly, 20 case summaries are presented at each meeting (approx).
4. The circumstances of each case are considered.
5. Written feedback is provided to the practitioners who provided the clinical care.
7. There is reporting of cumulative data, statewide perinatal data and recommendations for reducing perinatal and infant mortality.
8. Acts as an independent Committee and is in addition to local area/regional Committees.
PIMC [WA] Case Investigation

- All stillbirths and neonatal deaths of 26 weeks gestation or greater.
- Determine aetiology of death using PSANZ classifications.
- Determine a preventability score.
- Identification of contributing maternal factors.
- Assessment of the investigative work-up.

The medical records of cases to be examined are obtained by the committee. A comprehensive de-identified clinical summary is then prepared.

In Summary

- All perinatal deaths should be reviewed by the local Perinatal Mortality Committee.
- Audit should provide a high quality review of circumstances surrounding the perinatal death.
- The review should take place as soon as possible after the death, once core investigations are available.
- The Perinatal Mortality audit provides important feedback to health professionals.
- Maternity Units are urged to undertake audit activities.
- Perinatal deaths >26 weeks gestation are also reviewed by the statewide PIMC [WA].
Perinatal Mortality Classification

The following slides will examine the Perinatal Society of Australia and New Zealand (PSANZ) perinatal death classification.

Kumunurra WA

PSANZ - Perinatal death classification (PDC)

"To identify the single most important factor which led to the chain of events which resulted in the death". [1]

PSANZ - Neonatal death classification (NDC)

"...in addition to the perinatal death classification to identify the single most important factor in the neonatal period which caused the death". [1]

AND: "to identify important associated conditions".

Aim:

To identify preventable factors associated with perinatal mortality.

To reduce the number of associated deaths.
Dependant on the intended use of the conserved information, Perinatal Mortality Classification can also determine:

- Appropriate Counseling of parents
- Epidemiology and health surveillance
- Regional, international comparisons
- Causes and factors associated with the death
- Clinical practice improvement
- Reduce perinatal deaths
- Appropriate research

Used with permission; V. Flenady, PSANZ.

Specific perinatal causes:
- Unexplained antepartum: 29%
- Congenital abnormality: 21%
- Maternal conditions: 13%
- Spontaneous preterm: 10%
- Hypoxic peripartum: 2%
- Hypertension: 3%
- PPH: 7%
- APH: 7%
- Infection: 3%
- No obstetric antecedent: 2%

Used with permission; V. Flenady, PSANZ.
The PSANZ-PDC is a 4 digit coding system with 11 major categories.

The classification is intended for use in a hierarchical manner for the major categories. Thus, Category 1 Congenital Abnormality, if present, would take precedence over other categories.

The hierarchical system was adopted to improve usability and consistency.

The PDC is determined by the Perinatal and Infant Mortality Committee and entered into the database accordingly.

Perinatal Death Classification (PDC): Main Groups

1. Congenital abnormality
2. Perinatal infection
3. Hypertension
4. Antepartum haemorrhage
5. Maternal conditions
6. Specific perinatal conditions
7. Hypoxic peripartum death
8. Fetal growth restriction
9. Spontaneous preterm
10. Unexplained antepartum death
11. No obstetric antecedent
Perinatal Loss elearning audit/class section

1. Congenital abnormality subgroups:
   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 (1.8.1 musculoskeletal, 1.8.2 respiratory, 1.8.3 diaphragmatic hema, 1.8.4 haematological, 1.8.5 tumours, 1.8.8 other).
   1.9 Unspecified congenital abnormality

2. Perinatal infection subgroups:
   2.1 Bacterial (subgroups 2.11-2.19 by bacterial type)
   2.2 Viral (subgroups 2.21-2.29 by virus type)
   2.3 Protozoal
   2.5 Fungal
   2.8 Other specified organism
   2.9 Other unspecified organism

Includes: primary infections (term/preterm, fetal/neonatal) and secondary infections (e.g. >24hrs ruptured membranes prior to birth) leading to early onset (within 48hrs) infection.

Example: term prelabour rupture of membranes, (>24hours prior to birth) - neonatal pneumonia within 48hrs of birth - neonatal death - GBS on vaginal culture and gastric aspirate = 2.11.
Perinatal Loss elearning audit/class section

3. Hypertension subgroups:

3.1 Chronic hypertension: essential
3.2 Chronic hypertension: secondary (renal disease)
3.3 Chronic hypertension: unspecified
3.4 Gestational hypertension
3.5 Pre-eclampsia
3.6 Pre-eclampsia superimposed on chronic hypertension
3.9 Unspecified hypertension

Includes: deaths where the hypertensive disorder is considered the factor initiating the chain of events leading to the death.

Example: Hypertensive disorder causing abruption.

Ord River Dam WA

4. APH subgroups:

4.1 Placental abruption (4.11 - evidence of thromophilia)
4.2 Placenta praevia
4.3 Vasa praevia
4.8 Other APH
4.9 APH undetermined origin

Includes: deaths where primary factor was an APH.

Note: If the abruption is due to a hypertensive factor it is classified under category 3 (Hypertensive disorder).

Dampier Port WA
5. Maternal Conditions subgroups:

5.1 Termination of pregnancy for psychosocial indications
5.2 Diabetes/Gестational diabetes
5.3 Maternal Injury (5.3.1 accidental, 5.3.2 non-accidental)
5.4 Maternal Sepsis
5.5 Antiphospholipid syndrome
5.6 Obstetric cholestasis
5.8 Other maternal conditions (e.g. abuse)

Note: Should only be included here if there is a high probability that it was the cause of death.

6. Specific perinatal conditions subgroups:

6.1 Twin-twin transfusion
6.2 Fetomaternal haemorrhage
6.3 Antepartum cord complications (6.3.1 cord haemorrhage, 6.3.2 true knot with occlusion evidence, 6.3.8 other, 6.3.9 unspecified)
6.4 Uterine abnormalities
6.5 Birth trauma
6.6 Alloimmune disease
6.7 Idiopathic hydrops
6.8 Other specific perinatal conditions

Note: Includes deaths of normally formed, appropriately grown babies in which the perinatal condition was the major contribution to the death.
7. Hypoxic peripartum death subgroups:

7.1 With intrapartum complications
- (7.1.1 uterine rupture, 7.1.2 cord prolapse, 7.1.3 shoulder dystocia, 7.1.8 other)

7.2 Evidence of non-reassuring fetal status in a normally grown infant without intrapartum complications.

7.3 No intrapartum complications or non-reassuring fetal status

7.9 Unspecified hypoxic peripartum death

Includes: deaths where the fetus was alive at the onset of labour.

Note: typically babies >24 weeks or >600gms birthweight.

8. Fetal growth restriction (FGR) subgroups:

8.1 Evidence of reduced vascular perfusion on doppler studies and/or placental histopathology

8.2 Chronic villitis

8.3 No placental pathology

8.4 No examination of the placenta

8.8 Other placental pathology

8.9 Unspecified or not known if the placenta was examined

Includes: babies with a birthweight <10% for gestational age.

Note: Australian national birthweight percentiles are used.
9. Spontaneous preterm (<37 weeks) subgroups:

9.1 Spontaneous preterm with intact membranes, or membranes ruptured <24 hours (other subgroups applicable here)

9.2 Spontaneous preterm with rupture of membranes >24 hours before delivery (other subgroups applicable here)

9.3 Spontaneous preterm with membrane rupture of unknown duration (other subgroups applicable here)

Includes: normally formed, appropriately grown, no evidence of fetal or neonatal infection irrespective of induction or mode of delivery.

10. Unexplained antepartum death subgroups:

10.1 With evidence of reduced vascular perfusion on doppler studies and/or placental histopathology

10.2 With chronic villitis

10.3 No placental pathology

10.4 No examination of the placenta

10.8 Other specified placental pathology

10.9 Unspecified or not known whether the placenta was examined

Includes: normally formed, appropriately grown with no predisposing factors.
11. No obstetric antecedent subgroups:

11.1 Sudden infant death syndrome (SIDS) (further subgroups available here)
11.2 Postnatally acquired infection
11.3 Accidental asphyxiation
11.4 Other accident, poisoning or violence
11.8 Other specified
11.9 Unknown/undetermined
The Neonatal Death Classification (NDC) has 7 major categories. The NDC is applied in addition to the PDC to provide additional information on the causes of death present or arising in the neonatal period.

1. Congenital abnormality
2. Extreme prematurity
3. Cardio-respiratory disorder
4. Infection
5. Neurological
6. Gastrointestinal
7. Other

1. Congenital abnormality subgroups:
   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 (further subgroups for this group)
   1.9 Unspecified congenital abnormality
2. Extreme prematurity (<24 weeks or <600 gms) subgroups:
   2.1 Not resuscitated.
   2.2 Unsuccessful resuscitation.
   2.9 Unspecified or unknown whether resuscitation attempted.

3. Cardio-respiratory disorder subgroups:
   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 lung disease.
   3.6 Pulmonary haemorrhage.
   3.7 Pneumothorax.
   3.8 Other.

4. Infection subgroups:
   4.1 Congenital: 4.1.1 bacterial, 4.1.2 viral, 4.1.3 unspecified
   4.2 Acquired: 4.2.1 bacterial, 4.2.8 other, 4.2.9 unspecified
   4.3 Protozoal
   4.4 Spirochaetal
   4.5 Fungal
   4.8 Other
   4.9 Unspecified organism
5. Neurological subgroups:
   5.1 Hypoxic ischaemic encephalopathy/perinatal asphyxia
   5.2 Intracranial haemorrhage (further subgroups dependent on location)
   5.8 Other

6. Gastrointestinal subgroups:
   6.1 Necrotising enterocolitis
   6.8 Other

7. Other subgroups:
   7.1 SIDS (further subgroups available)
   7.2 Multisystem failure (further subgroups dependent on cause)
   7.3 Trauma (further subgroups dependent on cause)
   7.4 Treatment complications
      (7.41 surgical, 7.42 medical)
   7.8 Other specified
   7.9 Unknown/undetermined
In Summary:

- The classification system allows the identification of the single most important factor which caused the death.
- The classification is a coding system.
- The classification relies on the findings of clinical indicators and post mortem findings.
- The system aims to identify preventable factors of perinatal death to reduce the total number of perinatal deaths.

You have now completed the Perinatal Mortality Audit & Classification Module

Click the link to view the references for this module.