

Perinatal Mortality Guideline 3

CLASSIFICATION OF PERINATAL DEATHS

DEFINITIONS

There has been variation in the definition of perinatal mortality, both internationally and within North America. For consistency of data collection, the BCRCP promotes the use of definitions as outlined by the **British Columbia Vital Statistics Agency** (1998).

Perinatal Period – from 22 weeks gestation or \geq 500 g. birth weight to 7 completed days of life.

Neonatal Period – from birth through to 28 completed days of life.

Early Neonatal Period – from birth through to the first 7 days of life.

Late Neonatal Period – from 8 days of life through to 28 completed days of life.

Post Neonatal Period – from 29 days of life through to 1 year.

Livebirth – the complete expulsion or extraction from its mother, irrespective of the duration of the pregnancy, of a product of conception in which, after the expulsion or extraction, there is any of: breathing, beating of the heart, pulsation of the umbilical cord or unmistakable movement of voluntary muscle, whether or not the umbilical cord has been cut or the placenta is attached.

Stillbirth – an infant \geq 500 g. or 20 weeks gestation who shows no sign of life at delivery.

Neonatal Death – death of a child up to and including 28 days of age.

Perinatal Death – death that occurs as a stillbirth or in the early neonatal period ($<$ 7 days of age).

Gestational Age – Fetal age or duration of pregnancy measured from the first day of the last normal menstrual period, and expressed in completed days or weeks. Gestation may be determined from LMP, data from early ultrasound, or from combining the two. Determination of gestational age is best decided on a “case by case” basis by a Perinatal Mortality Review Committee.

Degree of Maceration (BCCWHC, 1999)

- A. None - no signs of maceration, fresh stillbirth, implying intrapartum death.
- B. Mild to Moderate - discolouration of umbilical cord, signs of skin slippage and bullae formation only. These cases have been dead in utero at least 6 hours, and in more extensive cases, over 24 hours.
- C. Severe - bones are loosening and cranium collapsed. These cases have been retained in utero for days to weeks.

**NOTE: For the purposes of review, “Perinatal” will be defined as:
from \geq 20 weeks / 500 g. to 28 completed days of life.**

CLASSIFICATION OF PERINATAL DEATHS AND USE OF THE PERINATAL MORTALITY FORM

There are differing opinions regarding how perinatal deaths are best classified (Baird et al, 1954; Barron, 1986; Cole et al, 1986; Fleiss, 1981; Hey et al, 1986; & Kelling et al, 1989). The original Aberdeen classification (Baird et al, 1954 & Baird et al, 1969) emphasized maternal causes of perinatal death. Later Wigglesworth et al. (Barron, 1986) and then others (Cole et al, 1986; Fleiss, 1981; Hey et al, 1986; & Keeling et al, 1989) advocated a pathophysiologic approach. In this guideline we categorize perinatal deaths into 4 groups using combined criteria.

The questions to be answered when determining the cause of death include:

1. To what group does a death belong i.e. what criteria define that group?
2. When did the death occur i.e. stillbirth or neonatal death?
3. How and why did the death occur?

There is a copy of the Perinatal Mortality Form in Appendix A. Please refer to it as you read through this section. First, it is noted whether a full or partial autopsy preceded the perinatal mortality review. Gestational age and gender are identified.

The following text guides the use of Parts I to IV of the Perinatal Mortality Form.

For all cases, indicate if there is evidence of asphyxia or not (see Appendix B – SOGC Task Force on Cerebral Palsy and Neonatal Asphyxia).

PART I. GROUP CLASSIFICATION

The major cause of death determines the group and the four groups are mutually exclusive. The Classification Algorithm in Appendix C is designed to assist with the classification process.

Group 1: Lethal Congenital Anomaly (LCA)

- A. Stillbirth ≥ 500 g. or ≥ 20 wks gestation
- B. Neonatal Death

Group 2: Stillbirth ≥ 500 g. or ≥ 20 wks gestation -Indicate degree of maceration

- A. None - no signs of maceration, fresh stillbirth, implying intrapartum death.
- B. Mild to Moderate - discolouration of umbilical cord, signs of skin slippage and bullae formation only. These cases have been dead in utero at least 6 hours, and in more extensive cases, over 24 hours.
- C. Severe - bones are loosening and cranium collapsed. These cases have been retained in utero for days to weeks.

Group 3: Immature and Premature Deaths

- A. < 28 wks. gestation or < 1000 g. (“immature”)
- B. ≥ 28 wks. gestation to < 37 wks. and ≥ 1000 g. (“premature”)

Group 4: Term Deaths ≥ 37 weeks

PART II. CAUSE(S) OF DEATH

Identify cause(s) of death.

PART III. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO THE DEATH

Other significant conditions or contributory factors implicated in a death should be identified, if possible. Any of these will usually fall within a variety of group headings. The group headings and a variety of examples of contributory factors follows:

Group Headings	Examples
Maternal	Severe preeclampsia, maternal heart disease, substance use
Placenta/cord	Amniotic bands, significant cord accidents, abruptio placenta
Fetal	Genetic and chromosomal abnormalities, blood incompatibility, multiple pregnancy, IUGR
Neonatal	Cold stress, sepsis, SGA
Socioeconomic	Poverty, poor antenatal care
Other	Infections, trauma

Please check the appropriate box in Part III on the Perinatal Mortality Form if applicable, and identify in text the specific contributory factors.

Part IV. Specify Preventability

When reviewing a perinatal death, the determination of “preventability” has relevance. Such analysis can lead to improvements in perinatal care; it also permits prediction of implementable and/or ideal perinatal mortality rates. Be assured that any commentary or classification in this or any other part of the form is protected under s. 51 of the *Evidence Act* and thus is immune from disclosure. Also, any use of this data to compile overall statistics will remain confidential. Classify preventability as non-preventable, possibly preventable, or ideally preventable. This classification of preventability is adapted from the *Alberta Perinatal and Neonatal Statistics & Maternal Mortality Annual Report, 1994 (1996)*.

1. Non – Preventable

All the following criteria have to apply for a death to be classified as non-preventable.

- Prenatal care and fetal surveillance were adequate and appropriate
- Intervention was available, accessible, appropriate and timely
- Circumstances surrounding a death were not preventable

2. Possibly Preventable

Unrecognized but detectable fetal or newborn compromise:

- Not detected or not appreciated
- Inappropriate, inadequate or untimely intervention

3. Ideally Preventable

A sudden, compromising event for the fetus or newborn where intervention was not possible on this occasion.

REFERENCES

Alberta Medical Association. (1996). Alberta Perinatal and Neonatal Statistics & Mortality Annual Report. Edmonton, Alberta.

Baird D., Walker, J. & Thomson, A.M. (1954) The causes and prevention of stillbirths and first week deaths. III. A classification of deaths by clinical cause: the effect of age, parity and length of gestation on death rates by cause. J. Obstet Gynaecol Br Emp, 61: p. 433-448.

Baird D. & Thomson A.M. (1969) The survey perinatal deaths reclassified by special clinico-pathological assessment. Perinatal Problems. (N.R. Butler & E. Alberman des). Churchill Livingstone. Edinburg. P. 200-210.

Barron, S.L. (1986) How can we improve perinatal surveillance? British Journal of Obstetrics and Gynaecology,93: p.1201-1203.

BC Children's & Women's Health Center. (1999). Dr. Virginia Baldwin, Pediatric Pathologist.

Cole S.K., Hey E.N. & Thomson A.M. (1986) Classifying perinatal death: an obstetric approach. British Journal of Obstetrics and Gynaecology, 93: p.1204-1212.

Fleiss J. L. (1981) Statistical Methods for Rates and Proportions (2nd ed). John Wiley: New York. P.188-236.

Hey E.N., Lloyd D.J. & Wigglesworth J.S. (1986) Classifying perinatal death: fetal and neonatal factors. British Journal of Obstetrics and Gynaecology, 93: p.1213-1223.

Keeling J.W., MacGillivray I., Golding J., Wigglesworth J., Berry J. & Dunn P.M. (1989) Classification of perinatal death. Archives of Disease in Childhood. 64: p.1345-1351.

Vital Statistics, (1998). British Columbia Vital Statistics Agency, Victoria, B.C.

APPENDIX A

PERINATAL MORTALITY FORM

DIRECTIONS FOR USE OF THE PERINATAL MORTALITY FORM

1. This form is designed for use by Committees performing Perinatal Mortality Reviews.
2. The form may be photocopied.
3. One form should be completed for each perinatal mortality case.
4. A copy to the form should be returned to the BCRCP for collation of a provincial report.
5. The form is currently on trial and may be revised. Once the form is revised it will be available with the Perinatal Forms Package.
6. As this form is on trial, we would appreciate your feedback. Please fax your comments to the BCRCP at (604) 875-3747.

PERINATAL MORTALITY FORM

Mother's Surname: _____

Baby's Surname: _____

Institution Name: _____

Chart Number _____ Baby Mother

PHN: _____ Baby Mother

Date of Birth: _____ Gestational Age: _____

If Multiple, delivery sequence: _____ of _____

Male Female Ambiguous Autopsy: Full Partial No Autopsy

Part I. Group Classification

(See reverse of form for **Group Classification**)

Group 1

A.

B.

Group 2

A.

B.

C.

Group 3

A.

B.

Group 4

Evidence of Asphyxia: Yes No

Part II.

Cause(s) of Death: (a) _____
Primary Cause of Death due to, or as a consequence of

Antecedent causes, if any, giving rise to the primary causes (a) above, stating the underlying causes last. (b) _____
due to, or as a consequence of

(c) _____
due to, or as a consequence of

(d) _____

Part III.

Other significant conditions contributing to the death.

Maternal _____
Placental/Cord _____
Fetal _____
Neonatal _____
Socio-economic _____
Unexplained _____
Other _____

Part IV. Specify Preventability (See reverse of form)

1. Not Preventable 2. Possibly Preventable 3. Ideally Preventable

Comments: _____

Name(Print): _____ Signature: _____ Date: _____

Place of Review: _____

Part I. GROUP CLASSIFICATION

Group 1: Lethal Congenital Anomaly (LCA)

- A. Stillbirth \geq 500 g. or \geq 20 wks gestation
- B. Neonatal Death

Group 2: Stillbirth \geq 500 g. or \geq 20 wks gestation

Indicate degree of maceration:

- A. None - no signs of maceration, fresh stillbirth, implying intrapartum death.
- B. Mild to Moderate - discolouration of umbilical cord, signs of skin slippage and bullae formation only. These cases have been dead in utero at least 6 hours, and in more extensive cases, over 24 hours.
- C. Severe - bones are loosening and cranium collapsed. These cases have been retained in utero for days to weeks.

Group 3: Immature and Premature Deaths

- A. $<$ 28 wks. gestation or $<$ 1000 g. ("immature")
- B. \geq 28 wks. gestation to $<$ 37 wks. and \geq 1000 g. ("premature")

Group 4: Term Deaths

PART IV. SPECIFY PREVENTABILITY

1. Not Preventable

All the following criteria have to apply for a death to be classified as non-preventable.

- Prenatal care and fetal surveillance were adequate and appropriate
- Intervention was available, accessible, appropriate and timely
- Circumstances surrounding a death were not preventable

2. Possibly Preventable

Unrecognized, but detectable fetal or newborn compromise but:

- Not detected or not appreciated
- Inappropriate, inadequate or untimely intervention

3. Ideally Preventable

A sudden, compromising event for the fetus or newborn where intervention was not possible on this occasion.

APPENDIX B

SOCIETY OF OBSTETRICIANS AND GYNAECOLOGISTS OF CANADA
Task Force on Cerebral Palsy and Neonatal Asphyxia
No. 19, December 1995 (p.9)

Diagnosis of Fetal Asphyxia (Hypoxic Acidaemia)

	Severity of the Hypoxic Acidaemia	
	Umbilical Artery pH	Umbilical Artery Base Deficit
Intervention Acidaemia	< 7.15	≥ 12 mmol/L
Possible Brain Damage Acidaemia	< 7.0	≥ 16 mmol/L

The essential characteristics of the newborn response to asphyxia of such a degree as to be likely to cause harm are:

- Apgar score 0 to 3 for ≥ 5 minutes
- Neonatal neurologic sequelae (e.g. hypotonia, seizures, coma)
- Evidence of multi-organ system dysfunction in the immediate neonatal period
- Umbilical cord arterial pH < 7.0, and
- Umbilical cord arterial base deficit ≥ 16 mmol/L.

All of these conditions must be present. In cases where evidence is lacking, we cannot conclude that hypoxic acidaemia existed or had the potential to cause neurologic deficits.

The presence of hypoxic acidaemia confirms that an episode of intrapartum fetal asphyxia has occurred. If the neonatal signs are lacking, then the duration of the asphyxial episode has been short and the likelihood of brain damage and neurologic deficits is small. However, in those cases with hypoxic acidaemia at the time of delivery and with neonatal complications, the potential for brain damage and resultant neurologic deficits is present.

