

Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death

Section 2

Institutional Perinatal Mortality Audit

Version 3.0, March 2018

Endorsed by



SECTION 2

INSTITUTIONAL PERINATAL MORTALITY AUDIT

2.1 Introduction

This section of the PSANZ Clinical Practice Guideline for Care Around Stillbirth and Neonatal Death presents recommendations on perinatal mortality audit in maternity hospitals, including classification of causes, associated conditions and contributing factors. Perinatal mortality audit is:

“a process to document the medical causes of each death and contributing systemic failures in order to identify solutions and take action. It is not a solution in itself. It is a systematic way of improving quality of care through collecting and analysing data, linking solutions and ensuring accountability for changes in care”¹.

The critical analysis of each death in a no-blame, interdisciplinary setting has the potential to “tell a story about what could have been done differently to unlock the solutions that should have been available for each woman and baby to prevent perinatal deaths”¹. Audit, when combined with feedback to care providers, can change practice and improve health outcomes, particularly when combined with an action plan and clear measurable targets².

The 2016 Lancet series on stillbirth highlighted the importance of high quality audit in reducing stillbirths³. In New Zealand, stillbirth rates at term have declined over the seven years since national perinatal audit began⁴. Perinatal mortality audits in the Netherlands⁵, the UK⁶, and New Zealand⁴ show substandard care factors are present in a high proportion of cases (20-30%, and up to 60% for intrapartum stillbirths). In Australia, while a national perinatal audit program is yet to be implemented, state committees produce regular reports on rates and causes of perinatal mortality⁷⁻¹⁴ and in Victoria¹⁰ and Western Australia⁷ health departments routinely undertake perinatal mortality audits.

In this section of the PSANZ Guideline for Care Around Stillbirth and Neonatal Death, practice recommendations are supplemented by audit tools checklists to assist clinicians to implement the guideline recommendations (See *Appendices E - G, J, K and T*).

This update of the guideline has been undertaken through a partnership between PSANZ and the NHMRC Stillbirth Centre of Research Excellence in Stillbirth.

2.2 Objective of this section

The main objective of Section 2 of the PSANZ Guideline for Care Around Stillbirth and Neonatal Death is to improve the quality of data collected on causes and contributing factors relating to care for stillbirths and neonatal deaths for the purposes of:

- Helping parents to understand why the death occurred and to assist in future pregnancy planning;
- Improving the quality of care parents receive after their child is either stillborn or dies in the neonatal period;
- Assisting in implementing audit as a tool for quality improvement in general; and

- Reducing stillbirths and neonatal deaths by improving clinical practice and informing appropriate research through enhancing the conduct of appropriate research, epidemiology and health surveillance and regional/international comparisons

2.3 What has changed in this update?

In this update, changes have been made to align the guideline with the recently developed WHO guideline “The WHO Stillbirth and Neonatal Death Review Tool”¹. While key recommendations are unchanged from the previous version, additional advice and justification is provided to enhance the conduct of high quality perinatal mortality audit at the facility level. Further, the recommended tool for systematic review of contributing factors has been revised to align with that used by the New Zealand Perinatal and Maternal Mortality Review Committee (PMMRC)⁴. As with other sections of this guideline, we have revised the formatting and reduced duplication across the different sections to enhance readability.

2.4 Research gaps

While perinatal mortality audit is accepted as an essential component of care and case studies across countries highlight the yield in terms of identifying substandard care factors, further high quality studies are needed to determine its value in improving practice and health outcomes¹⁵. Research to identify the optimal approaches to classification of perinatal deaths is also needed¹⁶. Additionally, outcomes associated with involving parents in perinatal mortality audit¹⁷ and methods to improve autopsy counselling and consent requires further research¹⁸.

2.5 Establishing a hospital based perinatal mortality audit program

Hospital leadership and support

Successful perinatal audit programs are those that are thoughtfully planned and where strong leadership is provided by committed health professionals. Poorly planned programs in which no action is taken following the review, result in disinterest and demoralised staff^{1,19}.

The perinatal mortality audit program should be linked with local standards in clinical quality and safety activities including the findings of root cause analysis (RCA)^{20,21} where undertaken, and the implementation of the perinatal audit review recommendations to improve practice and to avoid the same clinical errors occurring in future.

The audit program should have established systems for clear reporting of de-identified audit findings to the health service board’s quality (clinical governance) committee or lead. Further, systems for authorisation, implementation and evaluation of those recommendations and a process of escalation and reporting processes where serious system failures or misconduct are identified.

Hospital-based perinatal mortality audit programs should be overseen by an interdisciplinary perinatal mortality audit steering committee. The hospital administration needs to provide the committee with adequate support and governance to:

- Ensure an appropriate legal and ethical framework is in place;
- Encourage staff to actively support and participate in the audit program, enabling relevant clinical staff to attend the audit meetings;
- Ensure appropriate scheduling of meetings so the maximum number of key staff can attend, and cases are reviewed within an acceptable time frame;

- Ensure adequate staffing and resources are available for administration of meetings, and for data collection, analysis and report preparation, and organisation of meetings.

Membership and Roles of the Perinatal Mortality Audit Steering Committee, Audit and Educational meetings

The Perinatal Mortality Steering Committee should include an interdisciplinary team of key stakeholders with responsibility and authority to ensure recommendations are translated into actions.

Membership Perinatal Mortality Steering Committee may include representatives from: administration, neonatology/paediatrics, obstetrics, midwifery/nursing, pathology, clinical genetics, pharmacy, epidemiology/ statistics, social worker, general practice, but the committee should not be too large. The involvement of parents and/ or community representatives is gaining increasing interest and requires further exploration of potential benefits¹⁶.

The Perinatal Mortality Steering Committee members attend and oversee each *Perinatal Mortality Audit meeting* where individual perinatal deaths are reviewed in detail. Other members of staff may be invited to attend depending on the cases being reviewed.

The Perinatal Mortality Audit meetings are distinct from other *perinatal mortality educational meetings* which may be undertaken to present aggregate data on rates and trends in perinatal deaths and to assist in dissemination of recommendations and practice change and are open to all interested parties, including students. With appropriate mentorship, the Perinatal Mortality Audit meetings may also be helpful as an educational activity for students.

Smaller regional facilities and regional groups of facilities with smaller numbers of staff and infrequent perinatal deaths may combine the functions of the Perinatal Mortality Audit Steering Committee and the Perinatal Mortality Audit meetings.

Role of the Perinatal Mortality Steering Committee

- Establish and oversee the audit process including assigning responsibility and providing training and oversight of tasks such as data collection;
- Arrange a schedule of perinatal mortality audit meetings, setting the ground rules for and identifying an appropriate chairperson, and inviting relevant participants;
- Oversee the development and facilitate the dissemination and implementation of practice recommendations emanating from the audit;
- Oversee the production of reports on the outcome of the audit program including those required to relevant health department agencies;
- Oversee the implementation of the PSANZ Clinical Practice Guidelines for Care Around Stillbirth and Neonatal Death using the IMPROVE educational program²²;
- Oversee the revision and resubmission of the perinatal death certificate if required based on findings of the audit meeting; and
- Ensure that all staff members have access to adequate support following a perinatal death.

Section 2 Recommendations

- 1 All hospitals where births occur should implement a formal process for perinatal mortality audit of all perinatal deaths occurring in that hospitals. The process should be overseen by an interdisciplinary Perinatal Mortality Steering Committee.
- 2 Staff should be provided with appropriate training on best practice around the time of a perinatal death through the IMPROVE Program and access to support.

2.6 Regional and national considerations

Aggregated high quality audit can reveal common modifiable factors and potential solutions e¹. Consistent data systems and approaches provide a powerful tool for practice change to reduce perinatal deaths. Hospital-based perinatal mortality audit programs should be supported by, and feed into, regional and national audit programs overseen by key stakeholder committees. This process has been established in New Zealand (since 1994) with clear benefits⁴ and is currently being considered for Australia. In Australia production of an annual perinatal mortality report for Australia by the Australian Institute of Health and Welfare (AIHW) and establishment of a national advisory committee, and piloting of an on-line perinatal audit database through a NHMRC grant²³ are in progress. Establishing perinatal mortality audit at the national level will require support from national bodies, including ministries of health and professional colleges³.

2.7 The perinatal mortality audit cycle steps

We propose a seven-step cycle based on the cycle developed by the WHO¹; an additional step is included on feedback to parents. The seven steps are as follows: (1) identifying and scheduling the review of all perinatal deaths; (2) collecting and managing the information; (3) analysing information; (4) recommending solutions; (5) feedback and communication with parents; (6) implementing solutions; and (7) evaluating both the process and the outcomes and refining as indicated (Figure 1).



Figure 1 Steps in the perinatal mortality audit cycle

Step 1: Identify cases and schedule the review

- Establish a system to quickly identify all cases of perinatal deaths.
- Flag priority cases for rapid review (e.g. unexpected deaths in late gestation and intrapartum deaths).

The review of a perinatal death should be undertaken in a timely manner so that it occurs within recent memory of those involved and enables information from the review to be incorporated into discussion with the parents at their follow-up visit. A review should take place as soon as results are available from initial investigations. A further review of the death by the Mortality Committee, once the results of all investigations are available, may be necessary to finalise the cause of death and to ensure further follow-up is arranged as required. Timely review of the death may also facilitate appropriate counselling and support for staff.

Section 2 Recommendations

- 3** | The review of perinatal deaths should occur as soon as possible after the death aiming to have results in time for the initial follow-up visit with parents. It may be necessary to re-review the death if test results are delayed.

Step 2: Collect and manage the information

- Complete a comprehensive clinical summary for every perinatal death

Consultation with the woman (and her partner) about the course of events leading to the death should be undertaken as soon as possible and findings included in the case summary.

- Identify and train staff in data collection for perinatal mortality audit

This should include collecting a thorough history from the mother as soon as possible.

The Australian Perinatal Mortality Audit Tool (APMAT) (see *Appendix E – Australian perinatal mortality audit tool*) and New Zealand Rapid Reporting Form for a Perinatal Death (see *Appendix F (baby)* and *Appendix G (mother)*) have been designed to capture a standardised data set that should be collected for all perinatal deaths. This form is designed to fulfil requirements of health departments to ensure high quality data on causes of perinatal death nationally. To facilitate the data collection process clinicians should ensure that all relevant clinical details are documented clearly and accurately in the medical record at the time of the event and that all relevant documentation is completed according to local policy.

Data on each case should be:

- Recorded electronically;
- Include rates, causes, and contributing factors
- Link with other routinely collected data to minimise additional workload from the audit process

Section 2 Recommendations

- 4 | A comprehensive clinical summary, including a detailed interview with the mother as soon as possible after the death, should be completed for every perinatal death to facilitate institutional audit using the recommended paper-based form or on-line tool (APMAT, NZ Rapid reporting forms for a perinatal death) which, following the completion of the audit, should be provided to the jurisdictional perinatal mortality council or respective body. Clinicians should ensure clear and accurately documentation in the medical record at the time of the event to facilitate this process.

Step 3 Review and analyse the information

Generally, proceedings of the hospital Perinatal Mortality Audit meetings should include review of all perinatal deaths occurring in that hospital. Maternity services (particularly smaller hospitals) may choose to combine the audit meetings with another hospital committee or a regional mortality review committee.

- Develop a format for review of perinatal deaths, taking into account principles of confidentiality and impartiality, and any specific policy or legislative requirements relevant to the jurisdiction.

The aim of a perinatal mortality audit meeting is to provide an atmosphere of confidentiality and security that will encourage health care providers and managers to communicate openly and honestly with their colleagues. To achieve this, assurance should be sought by the administration of the institution that any information and discussion arising from the formal review will not be used in legal proceedings. As mechanisms for establishing perinatal mortality committees with the appropriate protection differ across Australia and New Zealand (ANZ), committees should seek advice from their respective health departments. It is the responsibility of each hospital's management to ensure that committee members and their deliberations are appropriately indemnified if required while undertaking this kind of audit on their behalf. Having case presentations which are completely anonymous may be helpful. However, within a single hospital, it is difficult to achieve a truly anonymous review.

Section 2 Recommendations

- 5 | The perinatal mortality audit meetings should have an experienced chairperson capable of ensuring a no-blame environment within an appropriate legal framework.

Chair and “rules of the meeting”

Review by a multidisciplinary team has been shown to increase the yield of information about the cause of deaths from mortality review²⁴. 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 to consider strategies for care improvement where necessary. Perinatal mortality audit meetings should be multidisciplinary, involve those health care professionals familiar with the circumstances of the perinatal death, and be conducted with a “no-blame” approach. The chairperson should be skilled in chairing meetings of a highly sensitive nature and accepted by peers to appropriately guide the discussion. While a senior medical practitioner usually fulfils the role of the chairperson, it is also important to involve nurses and midwives in this role¹. Having participants agree to a code of practice for review meetings and ensuring confidentiality as much as possible can contribute to an environment where audit is more likely to be successful²⁵ (see *Appendix K – WHO mortality audit meeting code of practice declaration*).

Assigning the cause of death

Every perinatal death occurring in the facility should be reviewed at the audit meeting and classified as to the causes of death according to the Perinatal Society of Australia and New Zealand (PSANZ)-Perinatal Death Classification (PDC) and Neonatal Death Classification (NDC). (Please refer to *Appendix E – Australian perinatal mortality audit tool; Appendix J – Perinatal mortality classifications: Quick reference sheet*). After review and classification of the cause of death, the death certificate may need to be revised and resubmitted (see item 6 below). For global comparisons, WHO recommends use of the ICD for perinatal mortality (ICD PM) which draws on the cause of death assigned on the death certificate. To ensure accuracy in cause of death data for perinatal deaths, the ICD PM²⁶ should be assigned after the audit meeting based on a revised death certificate where required. The purposes of the ICD and PSANZ system differ somewhat and these are discussed in more detail in Section 7 of the guideline.

Section 2 Recommendations

- 6 | As part of the audit meeting, the PSANZ Classification system should be used to assign the cause of death and associated conditions for every perinatal death

Systems Review - Determining the presence of contributing factors relating to care

The circumstances surrounding perinatal deaths should be considered to identify areas for practice improvement using the PSANZ Contributing Factors Relating to Care tool (included in *Appendix E – Australian perinatal mortality audit tool* to classify the type of factors present and also their relation to the death. Recommendations for practice improvement emanating from this review need to be carefully formulated (see below). This review should take into account recommendations of facility-based RCA if one was conducted. Determining whether contributory factors are present is an essential element of the review process that requires a systematic approach. PSANZ has adopted the tool used in New Zealand by the PMMRC²⁷ with a minor modification to include grades of certainty in the final decision of avoidability of the death. This has now been recommended for use by the AIHW for all Australian perinatal mortality committees.

Contributory factors are defined as modifiable components of the health system and issues of quality of care that cover a broad spectrum of organisation and/or management, personnel and access and/or engagement with care factors. The presence of these factors does not imply that a death could have been prevented if they were not present but rather that the risk of death may have been reduced. A death is considered potentially avoidable if the absence of the contributory factors may have prevented the death²⁷. Contributory factors may be highly specific to the death or generalised to the system(s). Identifying contributory factors that occur, and are inherent in, the system is an important part of the review. These factors are sub-classified into organisational and management, personnel and those relating to barriers to access and/or engagement in care. When assessing the presence of contributing factors relating to clinical care, best practice standards should be used as a benchmark, including hospital protocols and relevant national and international guidelines. Consideration of aspects of care provided after the death that may be improved in the future should also be undertaken and recommendations made to address these e.g. communication, counselling and bereavement support and investigations performed. It is important that the classification and coding of the contributing factors – and the preventability assessment – is performed consistently. This will allow reliable analysis and comparison of data relating to contributing factors.

Section 2 Recommendations

- 7 | As part of the audit meeting, the presence of contributing factors relating to care should be assessed and documented for every perinatal death using the format recommended in this guideline.

Step 4 Recommend solutions

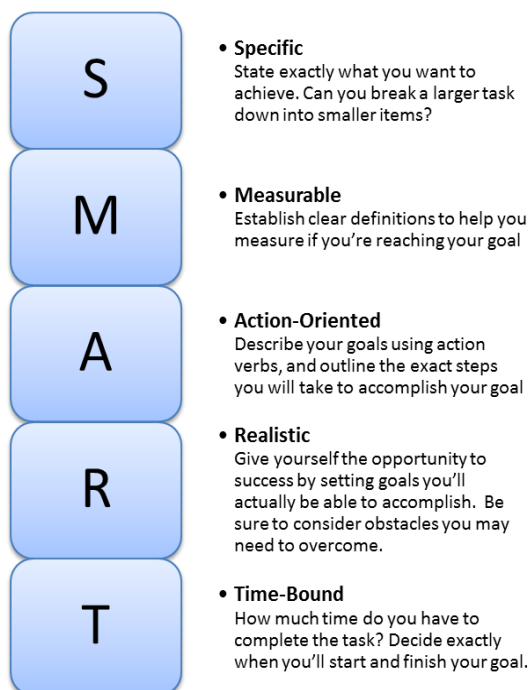


Figure 2 SMART criteria

The Perinatal Mortality Steering Committee should oversee the development of recommendations for action/solutions to problems identified. The SMART (specific, measurable, appropriate, relevant, and timely)²⁸ criteria (Figure 2) can help to ensure the proposed actions are achievable.

Section 2 Recommendations

- 8 Recommendations emanating from the audit process should be carefully developed and accompanied by an implementation plan which should be completed within a nominated time frame e.g. following the PDSA and SMART cycles.

Step 5 Communication and feedback to parents

Discussions between the parents and the main responsible health care provider about the death should be initiated as soon as possible after every perinatal death, using an open disclosure framework²⁹,

Meetings should preferably be led by the senior clinician responsible for care and include explanation and information appropriate to the parents' needs as well as an agreed plan for follow up meetings. It is important for the clinicians to acknowledge at this early meeting that there may be little information about the cause of death but that more information will be provided as results of investigations are available. Early feedback to the General Practitioner and

other relevant clinicians is important. Other key considerations in communication with parents are as follows:

- Follow-up meetings with parents to outline and explain the circumstances of the case should be scheduled with the senior clinicians who provided care present (obstetric, midwifery and paediatric)
- Where possible, someone with specific expertise in interpreting the results of perinatal death investigations and providing feedback on the outcome of the audit review should also attend
- Schedule these meetings after all relevant test results are available and following Perinatal Mortality Audit meeting review. Additional visits may need to be arranged if final results are delayed.
- Inform parents if the results of key investigations (such as autopsy) will not be available at the time of the scheduled meeting and offer them an additional or alternate time to receive those results

In cases of a congenital abnormality it may be appropriate to discuss the need for genetic counselling with a geneticist prior to the follow-up appointment with the senior clinician who provided care. The geneticist can then either attend the follow-up consultation or a further appointment can be offered at the time. Depending on the results of the initial investigation, it may also be necessary to arrange further tests.

Section 2 Recommendations

- 9** | Initiate discussions with parents as soon as possible after the perinatal death, using an open disclosure framework
- 10** | Senior clinicians should schedule follow-up meetings with the parents following perinatal death when relevant tests and reviews are complete, involving other specialists and additional investigations if indicated.
- 11** | Senior clinicians should notify the General Practitioner and other relevant care providers of the death as soon as possible and a comprehensive clinical summary sent to them promptly after the audit meeting.

Step 6 Implement changes

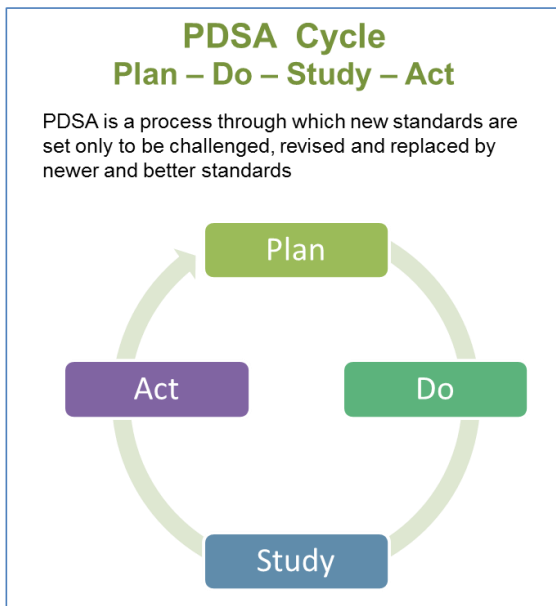


Figure 3 PDSA CYCLE

A process of feedback to clinicians needs to be in place so that individual practice and hospital policy can be improved as a result of the review process. Educational meetings, in addition to the perinatal mortality audit meetings, which engage a wider group of clinicians across the hospital may be helpful in translating findings from the audit into practice. The PDSA cycle is one method to assist in this process (Figure 3).

Step 7 Evaluate and refine the process

The final step in the audit cycle involves examining how successful each step of the process has been and in particular how effective it has been in changing practices and policies when required. An electronic data system is necessary to enable easy access to aggregate data to assess time trends in rates and causes of perinatal deaths and contributing factors. WHO has suggested a list of questions to help users assess and reflect on progress (Box 1)³⁰.

Box 1. Questions for reflection on the implementation and maintenance of the audit system

- How can review meetings be improved and used more effectively?
- How often and to whom is feedback given?
- What are the gaps in our feedback procedures?
- How can the feedback to service providers and senior management in the facility be improved?
- How can engagement in the audit process, the use of the findings and the application of recommendations be improved?
- How can feedback outside the facility be improved, e.g. district or provincial levels, and community?
- How can involvement from each of these levels be improved?
- Who is responsible for keeping the audit system together, e.g. one person, a team, formally or informally designated?
- Who is leading the audit? Who takes responsibility when the leader(s) is/are not there? What kind of succession plan do we have?
- How do staffing issues such as rotations and turnovers influence the audit activities?
- If lacking, how can staff stability be improved?
- What is our facility's responsibility in reaching out to another facility or facilities to introduce and establish an audit programme?

Source:³⁰

2.8 Completion of perinatal death certificates

The Royal College of Pathologists Australasia (RCPA) recommends that death certificates be issued or supervised by the senior clinician responsible for care³¹. As Perinatal Death Certificates are often issued prior to the results of investigations (particularly autopsy and placental pathology), this may result in significant error in cause of death data³²⁻³⁴. Review by a multidisciplinary clinical group has been shown to increase the value of post-mortem examinations in determining an accurate cause of death. Therefore it is essential that the audit meeting includes reviewing the details on death certificates for all perinatal deaths²⁴ and revisions made as required. The process of revising death certificates varies across regions. It is recommended that the Perinatal Mortality Committee become familiar with the process within their region and implement a process that ensures that a revised death certificate is submitted when required and to advise parents and their General Practitioners.

Section 2 Recommendations

- 12** | The Consultant responsible for care should complete or supervise completion of the Medical Certificate of Perinatal Death. The death certificate should be revised as required based on the outcome of the perinatal mortality audit meeting.

2.9 Definitions for registration and reporting of births and perinatal deaths

The definitions below are those from the AIHW³⁵ and New Zealand³⁶. Please note that definitions vary across jurisdictions in ANZ, please refer to *Appendix T – Australian and New Zealand definitions of perinatal mortality* for regional definitions.

Registration

The following definitions and examples are provided for clarification of the requirements for registration of births and perinatal deaths. While these terms are required for legal purposes care should be taken to use language appropriate for the intended audience, particularly in communication with parents, when relevant.

Livebirth

A livebirth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn³⁷.

Neonatal death

Neonatal death is defined as liveborn infant dying within 28 completed days of life regardless of gestation³⁸. Early neonatal death is death of a live born baby within 7 days of birth. Late neonatal death is death of a live born baby after 7 is completed days and before 28 completed days.

The Medical Certificate of Cause of Perinatal Death (MCCPD) for stillbirths neonatal death³⁹ is required by the ABS for all neonatal deaths according to the above definition. This definition applies regardless of the birthweight or gestational age and also for resuscitated stillbirths.

Example 1: Resuscitated stillbirth

Where an infant is stillborn and, following active resuscitation, a heartbeat is detected, the birth is required to be registered as a livebirth. If the infant subsequently dies up to 28 days of age registration as a neonatal death is necessary.

Fetal death (stillbirth)

In Australia:

Death, before the complete expulsion or extraction from its mother, of a product of conception of 20 or more completed weeks of gestation or of 400 grams or more birthweight. Death is indicated by the fact that, after such separation, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles⁴⁰.

The MCCPD is required by the Australian Bureau of Statistics (ABS) for all stillbirths according to the above definition. This definition applies regardless of the known or presumed timing of the death in utero. Examples are provided here of circumstances which may require clarification. There are some variations in approaches across regions e.g. in QLD the Registrar of Births Deaths and marriages does not require a death certificate for stillbirths where the death is known to occur prior to 20 weeks gestation regardless of the timing of birth. However, the QLD Health Department's Perinatal Data Collection still requires these deaths to be registered if the stillbirth is birthed is 20 weeks or greater, or weighs 400 grams or more.

In New Zealand:

A stillbirth is 'a dead fetus that'

(a) weighed 400 grams or more when it issued from its mother, or

(b) issued from its mother after the 20th week of pregnancy. (Births, Deaths and Marriages Registration Act 1995)

And, Stillbirths must be registered according to the legal requirements of this Act. They require a birth registration (stillbirth), but not a death registration³⁶.

Example 1: Fetus papyraceous

In the case of a birth after 20 weeks gestation where the birth weight is less than 400g and where a fetal death may have occurred at some time before the birth, the birth is considered a stillbirth. However, in the case of fetus papyraceous where the fetus is not readily recognisable, the requirement for registration varies across jurisdictions.

Example 2: Multiple pregnancy

2A: In the case of a twin pregnancy with a fetal death of Twin 1 at 19 weeks and spontaneous onset of labour and delivery at 23 weeks gestation where Twin 2 is live born weighing 550g and Twin 1 weighs 200g, Twin 1 is registered as a stillbirth and Twin 2 as a livebirth.

2B: In the case of a twin pregnancy with a fetal death and spontaneous delivery of Twin 1 at 19 weeks weighing 200g and subsequent fetal death and delivery of Twin 2 at 21 weeks weighing 300g, Twin 1 is not required to be registered, however Twin 2 must be registered as a stillbirth.

Reporting to enhance comparability across ANZ

Variation due to different definitions used for reporting of perinatal deaths makes comparisons across ANZ problematic (*Appendix T – Australian and New Zealand definitions of perinatal mortality*). To ensure consistency and comparability, it is recommended that reporting of stillbirths and neonatal deaths adhere to the above recommended definitions. Further, aggregate data on rates and causes should identify perinatal deaths resulting from a termination of pregnancy (TOP), presenting data with and without the inclusion of terminations. The PSANZ classification enables identification of TOP for each condition in this system (please refer to Section 7).

Section 2 Recommendations

10

To ensure consistency and comparability in perinatal death data across ANZ, the definitions recommended in this guideline are used including presenting data with and without the inclusion of perinatal deaths resulting from termination of pregnancy.

2.10 References

1. World Health Organisation. Making every baby count: audit and review of stillbirths and neonatal deaths Geneva: World Health Organisation; 2016.
2. Ivers N, Jamtvedt G, Flottorp S, et al. Audit and feedback: Effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, 2012. (accessed).
3. Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich JJ, Coory M, for the Lancet Ending Preventable Stillbirths series study group. Stillbirths: Recall to action in high-income countries. *The Lancet* 2016; **387**(10019): 691-702.
4. Perinatal and Maternal Mortality Review Committee. Tenth annual report of the Perinatal and Maternal Mortality Review Committee: Reporting mortality: Reporting mortality 2014. Wellington, NZ: Health Quality & Safety Commission, 2016.
5. Eskes M, Waelput AJM, Erwich JJ, et al. Term perinatal mortality audit in the Netherlands 2010-2012: A population based cohort study. *BMJ Open* 2014; **4**: e005652.
6. West Midlands Perinatal Institute. Confidential enquiry into intrapartum related deaths: NHS Perinatal Institute, 2010.
7. Ballestas T, on behalf of the Perinatal and Infant Mortality Committee of Western Australia. The 14th report of the perinatal and infant mortality committee of Western Australia for deaths in the triennium 2008-2010. Perth: Department of Health, WA, 2014.
8. Maternal and Perinatal Mortality Committee. Maternal and perinatal mortality in South Australia 2013. Adelaide: SA Health, Government of South Australia, 2015.
9. Council of Obstetric & Paediatric Mortality & Morbidity. Council of Obstetric & Paediatric Mortality & Morbidity Annual Report 2013. Tasmania: Department of Health and Human Services, Tasmanian Government, 2013.
10. Consultative Council on Obstetric and Paediatric Mortality and Morbidity. 2012 and 2013 Victoria's Mothers and Babies. Melbourne: State Government of Victoria, 2016.
11. Child Deaths Review and Prevention Committee. Northern Territory Child Deaths Review and Prevention Committee: Annual Report 2012-2013. Darwin: Office of the Children's Commissioner, 2013.
12. ACT Health. Perinatal Mortality in the ACT 2006-10,. Canberra, ACT: ACT Government, 2013.
13. Centre for Epidemiology and Evidence. New South Wales Mothers and Babies 2013. Sydney: NSW Ministry of Health, 2015.
14. Queensland Maternal and Perinatal Quality Council. Maternal and perinatal mortality in Queensland: Queensland Maternal and Perinatal Quality Council Report 2015. Herston, QLD: State of Queensland (Queensland Health); 2015.
15. Pattinson RC, Say L, Makin JD, Bastos MH. Critical incident audit and feedback to improve perinatal and maternal mortality and morbidity. *Cochrane Database of Systematic Reviews* 2005; (4).
16. Flenady V, Wojcieszek AM, Ellwood D, et al. Classification of causes and associated conditions for stillbirths and neonatal deaths. *Seminars in Fetal and Neonatal Medicine* 2017; **22**(23).
17. Bakhbakhi D, Siassakos D, Burden C, et al. Learning from deaths: Parents' Active Role and ENgagement in The review of their Stillbirth/perinatal death (the PARENTS 1 study). *BMC Pregnancy and Childbirth* 2017; **17**(1): 333.
18. Horey D, Flenady V, Heazell AE, Khong TY. Interventions for supporting parents' decisions about autopsy after stillbirth. *The Cochrane Library* 2013.
19. Kerber K, Mathai M, Lewis G, et al. Counting every stillbirth and neonatal death through mortality audit to improve quality of care for every pregnant woman and her baby. *BMC Pregnancy and Childbirth* 2015; **15** (Suppl 2).
20. Boyer MM. Root cause analysis in perinatal care: health care professionals creating safer health care systems. *J Perinat Neonatal Nurs* 2001; **15**(1): 40-54.
21. Nicolini D, Waring J, Mengis J. Policy and practice in the use of root cause analysis to investigate clinical adverse events: mind the gap. *Social Science & Medicine* 2011; **73**(2): 217-25.
22. Gardiner PA, Kent AL, Rodriguez V, et al. Evaluation of an international educational programme for health care professionals on best practice in the management of a perinatal death: IMproving Perinatal

- mortality Review and Outcomes Via Education (IMPROVE). *BMC Pregnancy and Childbirth* 2016; **16**(1): 376.
23. The Australian and New Zealand Stillbirth Alliance Research Consortium. Investigating the causes of stillbirth: Study Protocol: ANZSA Coordinating Centre, Mater Medical Research Institute, 2012.
 24. Brodrie M, Laing IA, Keeling JW, McKenzie KJ. Ten years of neonatal autopsies in tertiary referral centre: retrospective study. *BMJ* 2002; **324**(7340): 761-3.
 25. Lewis G. The cultural environment behind successful maternal death and morbidity reviews. *Bjog* 2014; **121** (Suppl 4): 24-31.
 26. Allanson E, Tunçalp Ö, Gardosi J, et al. Classifying the causes of perinatal death. *Bull World Health Organ* 2016; **94**(79-79A).
 27. Perinatal and Maternal Mortality Review Committee. Ninth annual report of the Perinatal and Maternal Mortality Review Committee: Reporting mortality 2013. Wellington: Health Quality & Safety Commission, 2015.
 28. Performance indicators in community health project working group. Performance indicators in community health: development of a process: Department of Human Services and Community Health Services South Australia; 2002.
 29. Australian Commission on Safety and Quality in Health Care. Australian Open Disclosure Framework. Sydney: ACSQHC, 2013.
 30. Belizan M, Bergh AM, Cilliers C, Pattinson RC, Voce A, Synergy G. Stages of change: A qualitative study on the implementation of a perinatal audit programme in South Africa. *BMC Health Serv Res* 2011; **11**: 243.
 31. Royal College of Pathologists of Australasia. The decline of the hospital autopsy: a safety and quality issue for healthcare in Australia. *Med J Aust* 2004; **180**(6): 281-5.
 32. Cartledge PH, Dawson AT, Stewart JH, Vujanic GM. Value and quality of perinatal and infant postmortem examinations: cohort analysis of 400 consecutive deaths. *BMJ* 1995; **310**(6973): 155-8.
 33. Duley LM. A validation of underlying cause of death, as recorded by clinicians on stillbirth and neonatal death certificates. *Br J Obstet Gynaecol* 1986; **93**(12): 1233-5.
 34. Kirby RS. The coding of underlying cause of death from fetal death certificates: Issues and policy considerations. *Am J Public Health* 1993; **83**(8): 1088-91.
 35. Australian Institute of Health and Welfare. Australia's mothers and babies 2014—in brief. Canberra: AIHW; 2016.
 36. Ministry of Health. A guide to certify causes of death. Wellington, NZ: NZ Health Information Service; 2001. p. 17.
 37. World Health Organisation. Making pregnancy safer: Report by the secretariat: World Health Organisation, 2002.
 38. World Health Organization. The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM, 2016.
 39. Australian Bureau of Statistics. Causes of Death, Australia, cat. no 3302.0. Canberra: ABS, 2015.
 40. Australian Institute of Health and Welfare. Australia's mothers and babies 2013 - in brief. Canberra: AIHW, 2015.

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2.13 Appendices

Appendix E – Australian perinatal mortality audit tool

Appendix F – New Zealand rapid reporting form for a perinatal death - baby

Appendix G – New Zealand rapid reporting form for a perinatal death - mother

Appendix J – Perinatal mortality classifications: Quick reference sheet

Appendix K – WHO mortality audit meeting code of practice declaration

Appendix T – Australian and New Zealand definitions of perinatal mortality