Supplement: Neonatal stabilisation for retrieval
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1 Introduction
This document is a supplement to the Queensland Maternity and Neonatal Clinical Guideline: *Neonatal stabilisation for retrieval*. It provides supplementary information regarding guideline development, makes summary recommendations, suggests measures to assist implementation and quality activities and summarises changes to the guideline since original publication (if any). Refer to the guideline for abbreviations, acronyms, flow charts and acknowledgements.

1.1 Funding
The development of this guideline was supported with funding from the Centre for Health Care Improvement Queensland Health. The Clinical Lead and Working Party including consumer representatives participated on a voluntary basis however the consumer representative on the Steering Committee was paid a sitting fee.

1.2 Conflict of interest
No conflict of interest was identified.

1.3 Guideline review
The Queensland Maternity and Neonatal Clinical Guidelines are reviewed every 5 years or earlier if significant new evidence emerges. Table 1 provides a summary of changes made to the guidelines since original publication.

<table>
<thead>
<tr>
<th>Date</th>
<th>Identifier</th>
<th>Summary of major change</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2011</td>
<td>MN11.18-V1-R16</td>
<td>First publication</td>
</tr>
</tbody>
</table>

2 Methodology
The Queensland Maternity and Neonatal Clinical Guideline Program (the Program) follows a rigorous process of guideline development. This process was endorsed by the Queensland Health Patient Safety and Quality Executive Committee in December 2009. The guidelines are best described as "evidence informed consensus guidelines" and draw from the evidence base, existing national and international guidelines and the expert opinion of the working party.

2.1 Topic identification
The topic was identified as a priority by the Statewide Maternity and Neonatal Clinical Network at a forum in 2009.

2.2 Scope
The scope of the guideline was determined using the PICO (Population, Intervention, Comparison, Outcome) criteria identified in Table 2.

<table>
<thead>
<tr>
<th>PICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Intervention</td>
</tr>
<tr>
<td>Comparison</td>
</tr>
<tr>
<td>Outcome</td>
</tr>
</tbody>
</table>
2.3 Clinical questions
The following clinical questions were generated to inform the guideline scope and purpose:
- What factors influence the decision to transfer a baby?
- What care may be required?
- What care is essential when stabilising specific conditions?
- What preparation is required for retrieval?
- How can parent(s) be supported?
- What quality improvement opportunities can be identified?

Exclusions
- Transport process
- Back transfers

2.4 Search strategy
A search of the literature was conducted during January 2010 using multiple techniques including search and review of:
- Known guideline sites (e.g. Royal Australian and New Zealand College of Obstetricians and Gynaecologists, National Guideline Clearing House, Royal College of Obstetrician and Gynaecologists, Society of Obstetricians and Gynaecologists of Canada)
- Synthesised evidence (e.g. UpToDate, Cochrane reviews)
- Summaries of relevant literature (e.g. searching Cinahl, PubMed)
- Individual case reports, studies and trials identified in the literature
- Relevant reference lists

2.5 Consultation
Major consultative and development processes occurred between October 2010 and March 2011. These are outlined in Table 3.

Table 3. Major guideline development processes

<table>
<thead>
<tr>
<th>Process</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical lead</td>
<td>• The nominated clinical lead was approved by the Program Steering Committee</td>
</tr>
<tr>
<td>Consumer participation</td>
<td>• Consumer participation was invited from a range of consumer focused organisations who had previously accepted an invitation for on-going involvement with the Program and guideline development</td>
</tr>
</tbody>
</table>
| Working party       | • An EOI for working party membership was distributed via email to Queensland clinicians and stakeholders (~1000) in July 2010  
                        • The working party was recruited from responses received  
                        • Working party members who participated in the working party consultation processes are acknowledged in the guideline  
                        • Working party consultation occurred in a virtual group via email                                                                 |
| Statewide consultation | • Consultation was invited via email from Queensland clinicians and stakeholders (~1000) during February 2011  
                             • Feedback was received primarily via email  
                             • All feedback was compiled and provided to the clinical lead and working party members for review and comment |
| Endorsement         | • The guideline was endorsed by:  
                             o The Program Steering Committee in June 2011  
                             o Statewide Maternity and Neonatal Clinical Network in July 2011  
                             o Queensland Health Patient and Safety Quality Executive Committee in August 2011 |
2.6 Publication
The guideline was published on the Program website in October 2011
The guideline can be cited as:


The guideline supplement can be cited as:


3 Summary recommendations
The Australian Resuscitation Council’s (ARC) levels of evidence inform the summary recommendations in Table 5. The ARC use the National Health and Medical Research Council’s level of evidence (refer to Table 4) and have added the terms ‘expert consensus opinion’ and ‘treatment recommendations’. These are defined by ARC (Guideline 1.4) as follows.

‘Expert consensus opinion’:
Where the development of a guideline has been based on “expert consensus opinion” or other levels of evidence [not included in the NHMRC levels of evidence]…

‘Treatment recommendations’:
… a ‘treatment recommendation’…brings together scientific evidence, clinical experience, community values and good sense in apply the guideline. Treatment recommendation criteria includes:

- **Class A** Recommended: Treatment recommendations are given to those guidelines which are considered to be beneficial and should be used
- **Class B** Recommendation: treatment recommendations are given to those guidelines which may be beneficial and are acceptable to be used if considered appropriate in that setting

Table 4. Levels of evidence

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Evidence obtained from a systematic review of all relevant randomised controlled trials</td>
</tr>
<tr>
<td>II</td>
<td>Evidence obtained from at least one properly designed randomised controlled trial</td>
</tr>
<tr>
<td>III-1</td>
<td>Evidence obtained from well-designed pseudo randomised controlled trials (alternate allocation or some other method)</td>
</tr>
<tr>
<td>III-2</td>
<td>Evidence obtained from comparative studies including systematic review of such studies with concurrent controls and allocation not randomised (cohort studies), case control studies or interrupted time series with a control group</td>
</tr>
<tr>
<td>III-3</td>
<td>Evidence obtained from comparative studies with historical control, two or more single arm studies, or interrupted time series without parallel control group</td>
</tr>
<tr>
<td>IV</td>
<td>Evidence obtained from case series, either post-test or pre-test and post-test</td>
</tr>
</tbody>
</table>
### 3.1 Summary recommendations

Summary recommendations (refer to Table 5) and levels of evidence are as per the ARC Neonatal guidelines.

#### Table 5. Summary recommendations

<table>
<thead>
<tr>
<th>Summary recommendations</th>
<th>Levels of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Guideline Section 1</td>
<td>Class A - expert consensus opinion</td>
</tr>
<tr>
<td>It is well established that wherever possible, babies who are likely to require neonatal, special or intensive care should be born at a centre that can provide an appropriate level of care</td>
<td></td>
</tr>
<tr>
<td>2 Guideline Section 2</td>
<td>Class A - expert consensus opinion</td>
</tr>
<tr>
<td>Early consultation should be undertaken to discuss management and arrange transport or retrieval</td>
<td></td>
</tr>
<tr>
<td>3 Guideline Section 3</td>
<td>Class A - expert consensus opinion</td>
</tr>
<tr>
<td>A person trained in advanced neonatal resuscitation (all the skills of basic neonatal resuscitation plus endotracheal intubation and ventilation, vascular cannulation and the use of drugs and fluids) should be available for low-risk births and in attendance for all births considered at high risk for needing neonatal resuscitation</td>
<td></td>
</tr>
<tr>
<td>4 Guideline Section 4.1</td>
<td>III-3</td>
</tr>
<tr>
<td>Very premature infants, (especially below 28 weeks gestation) very easily become cold and are best kept warm after birth by establishing an ambient temperature of a least 26°C and placing the infant immediately after birth (without drying) in a polyethylene bag or under a polyethylene sheet (appropriate size, food or medical grade, heat resistant), up to the neck</td>
<td></td>
</tr>
<tr>
<td>5 Guideline Section 4.4 – Table 1</td>
<td>IV</td>
</tr>
<tr>
<td>For babies requiring resuscitation and/or respiratory support, pulse oximetry is recommended both to monitor heart rate and to assess oxygenation. The sensor should be placed on the infant’s right hand or wrist before connecting the probe to the instrument</td>
<td></td>
</tr>
<tr>
<td>6 Guideline Section 4.4.1 – Table 2</td>
<td>I</td>
</tr>
<tr>
<td>Administration of endotracheal surfactant should be considered very early during the stabilisation of premature infants who have needed intubation for resuscitation</td>
<td></td>
</tr>
<tr>
<td>7 Guideline Section 4.5.2 – Table 4</td>
<td>Class A - expert consensus opinion</td>
</tr>
<tr>
<td>Volume expanding fluids: Intravascular fluids should be considered when there is suspected blood loss; the infant appears to be in shock (pale, poor perfusion, weak pulse) and has not responded adequately to other resuscitative measures</td>
<td></td>
</tr>
<tr>
<td>8 Guideline Section 4.6.1</td>
<td>I</td>
</tr>
<tr>
<td>There is increasing evidence that inducing hypothermia in infants of 36 weeks gestation and above with evolving moderate to severe hypoxic ischaemic encephalopathy may reduce the degree of brain injury in some</td>
<td></td>
</tr>
<tr>
<td>9 Guideline Section 4.6.1</td>
<td>Class A - expert consensus opinion</td>
</tr>
<tr>
<td>Any infant who is considered a candidate for therapeutic hypothermia should be discussed promptly with a Neonatologist and plans should be made for admission to a neonatal intensive care unit</td>
<td></td>
</tr>
<tr>
<td>10 Guideline Section 4.7 – Table 7</td>
<td>Class B - expert consensus opinion</td>
</tr>
<tr>
<td>Blood glucose level should be checked soon after resuscitation. Infants who require resuscitation are more likely to develop hypoglycaemia</td>
<td></td>
</tr>
</tbody>
</table>
4 Implementation

This guideline is applicable to all Queensland public and private maternity facilities and can be downloaded in Portable Document Format (PDF) from www.health.qld.gov.au/qcg

4.1 Guideline resources

The following guideline components are provided on the website as separate resources:
- Flowchart: Antenatal in-utero transfer
- Flowchart: Postnatal stabilisation for retrieval
- Checklist: Preparation for neonatal retrieval
- Appendix A: Peripheral intravenous insertion sites
- Appendix B: UAC and UVC insertion distances

4.2 Suggested resources

During the development process stakeholders identified additional resources with potential to compliment and enhance guideline implementation and application. The following resources have not been sourced or developed by the Program but are suggested as complimentary to the guideline:
- Patient information on neonatal stabilisation for retrieval
- Development of remote area Clinical Nurse Consultants’ training and accreditation in neonatal stabilisation
- Guideline education and audit tools

4.3 Implementation measures

Suggested activities to assist implementation of the guideline are outlined below:

4.3.1 Program measures
- Notify Chief Executive Officer and relevant stakeholders
- Monitor emerging new evidence to ensure guideline reflects contemporaneous practice
- Capture user feedback
- Record and manage change requests
- Review guideline in 2016

4.3.2 District Health Service measures
- Table the guideline at the local Patient Safety and Quality Committee meeting
- Replace all other guidelines on this topic with the current version of this guideline
- Promote the introduction of the guideline to relevant health care professionals. For example at staff forums, clinical handovers, incorporate into orientation packages
- Provide education and training through inservice programs
- Develop or access suggested resources as identified in the guideline, section 4.2

4.4 Clinical quality measures

The following clinical quality measures are suggested:
- Each retrieval should be reviewed in order to identify areas of educational need
- Use the Guideline’s checklist to audit retrieval preparation processes
- Referring centres should seek debriefing/feedback opportunities where relevant and also provide feedback to retrieval facility teams if quality improvement opportunities are identified
- Benchmarking and key performance indicators (KPI) are collected centrally by retrieval providers and may be accessed for feedback about individual cases
- Retrieval providers may be able to provide educational support if specific needs are identified