Background

Seventy percent of the infants requiring resuscitation at birth can be predicted from the presence of some condition of pregnancy or labour. Up to 10% of newborn infants require some form of resuscitation after birth. 1% need extensive resuscitation to survive.

Resuscitation of the newborn at delivery is a core competency and is a skill that is required of all midwives involved in home births. It is a requirement that all midwives are credentialed with this skill on an annual basis.

Where the need for newborn resuscitation can be predicted, for example where there has been shoulder dystocia, it is the responsibility of the midwife to have summoned the support midwife (if not already present), and an ambulance to provide assistance and immediate transfer with newborn resuscitation.

All infants born at home must receive appropriate resuscitation if required. There is no place for partial or graded resuscitation. Where unexpected problems arise full resuscitation must occur, followed by admission to hospital and assessment. The merits of ongoing care can be discussed with the parents by the hospital staff once a full assessment of the infant’s condition has been made.

Preparation for birth in the home

All equipment necessary for resuscitation in the home must be checked by the midwife prior to attending the client’s home and again on arrival, to ensure it is fully operational prior to the birth. The equipment must be set up in a well-lit area and must be immediately accessible and ready for use. When neonatal resuscitation is anticipated, for example where significant fetal heart rate abnormalities have been detected and birth is imminent an ambulance must be called prior to the birth (refer to CMP guideline Transfer from home to hospital).

Equipment required for neonatal resuscitation in the home

- Clean/dry towels – warmed if required using a hot water bottle or heat source.
- Baby hat
- Clock/timer/fob watch
- Oxygen
- Mechanical suction
- Neonatal resuscitator (self-inflating bag and mask)
Newborn Resuscitation Algorithm

- Term gestation? 
- Breathing or crying? 
- Good tone? 
  - No 
  - Warm, clear airway if necessary, dry, stimulate 
  - No 
  - Cut cord and move baby to resuscitation area to facilitate good airway management 
  - Yes 
  - HR below 100, gasping, or apnoea? 
    - No 
    - Laboured breathing or persistent cyanosis? 
      - Yes 
      - Clear airway. Give supplemental oxygen at 6L per minute. Call ambulance 
      - No 
      - PPV 
    - Yes 
    - Check for signs of effective ventilation 
      - No 
      - HR below 60? 
        - No 
        - Chest compressions coordinated with PPV 
        - Yes 
        - Post resuscitation care 
      - Yes 
      - Call ambulance 

Routine Care
- Provide warmth 
- Clear airway if necessary 
- Dry 

© 2010 American Heart Association
* CMP modification
AIRWAY MANAGEMENT AND MANUAL VENTILATION

SUCTIONING TO CLEAR THE AIRWAY
Routine suctioning is no longer recommended at birth.³

MECONIUM STAINED LIQUOR (where birth is imminent and there is no time for transfer to hospital).

If meconium is present and the neonate is not vigorous at birth (absent or depressed respirations and decreased muscle tone), suctioning should be performed.

POSITION OF THE NEONATE HEAD
Position the neonate’s neck in a slightly extended position referred to as the “head neutral” position. This may be extended slightly if required to the “sniffing position” to maintain an open airway.¹

OPERATOR POSITIONING TO PERFORM VENTILATION
The midwife performing ventilation should position themself at the neonate’s side or head. This position allows clear visualisation of the chest and abdomen.²
TECHNIQUE FOR MASK VENTILATION

1. Ensure the airway is open by:
   - Correctly adjusting the head/neck position to ensure the airway is open and
   - Clearing the airway as required

2. Inflate the lungs with sufficient pressure and volume that the chest and upper abdomen move slightly, ensuring chest wall movement appears the same as a normal quiet respiration. The oxygen flow rate is administered at 6 L/minute.

3. Perform ventilation at a rate of 40-60 breaths per minute for approximately 30 seconds.

4. Check the neonate’s heart rate after approximately 30 seconds for no more than 6 seconds.

SIGNS OF EFFECTIVE VENTILATION

Effective ventilation is observed when

- a rise in the chest and upper abdomen is observed with each inflation.
- the heart rate is above 100/ min.

If signs of effective ventilation are not present:

- check that the airway is not blocked - reposition the head, check for secretions and perform suction as required.
- ensure the mask is the appropriate size and correct fit.
- reapply the mask and lift the jaw forward.
- reassess the ventilation technique.
- recheck the device to ensure it is correctly fitted and working. Ensure there are no leaks in the circuit or device.
- ensure enough pressure is being applied.

NEONATAL EXTERNAL CARDIAC MASSAGE

1. Chest compressions are indicated when the heart rate is less than 60 beats per minute despite adequate ventilation for 30 seconds.

2. During resuscitation the compression rate is 90 per minute, and the breathing rate is 30 per minute. This equates to 120 “events” per minute.
3. One cycle consisting of 3 heart compressions plus 1 ventilation takes 2 seconds. 2,3

4. Chest compressions should depress the lower half of the sternum approximately 1/3 of the chest anterior-posterior diameter. 1

TECHNIQUE OF EXTERNAL CARDIAC MASSAGE

There are two techniques used for performing external cardiac massage:

**Thumb technique** – two thumbs are used to depress the sternum, while the hands encircle the torso and the fingers support the spine. This method is less tiring, provides more consistent pressure, generates better peak systolic and coronary arterial perfusion pressure and is better at controlling the depth of the compressions. It is the preferred option. 2

**Finger technique** – the tips of the middle finger and either the index finger or ring finger of one hand are used to compress the sternum. If the neonate is *not* on a firm surface the other hand can be used to support the back. This may be more suitable if the neonate is large, or the person performing resuscitation has small hands.

POSITIONING OF THE THUMBS OR FINGERS DURING COMPRESSIONS

Pressure is applied to the lower third of the sternum, which lies between the xyphoid and a line drawn between the nipples. 2

DEPTH OF CARDIAC COMPRESSIONS

Enough pressure is used during a cardiac compression to depress the sternum to a depth of approximately one third of the anterior-posterior diameter of the chest. The pressure is then released to allow the heart to refill. 2
The tips of the fingers or thumbs should be in contact with the neonatal chest at all times during both compression and release.

WHEN TO STOP CARDIAC COMPRESSIONS

- After 45 - 60 seconds of chest compressions and ventilations, the compressions should be stopped long enough to determine the heart rate for no more than 6 seconds.\textsuperscript{2}

- If the heart rate is \textbf{above} 60 beats per minute and increasing, the compressions may then be ceased.\textsuperscript{1,2} The ventilation should be continued at 40 – 60 breaths a minute.\textsuperscript{2}

- If the heart beats are \textbf{greater} than 100 beats per minute, discontinue compressions. Ventilation should continue until the newborn is breathing spontaneously.\textsuperscript{2}

- If the heart rate continues to remain \textbf{below} 60 beats per minute continue management as per the Neonatal Resuscitation Algorithm overleaf.

Post resuscitation care
Babies who require positive-pressure ventilation (PPV) or more extensive resuscitation require ongoing support. These neonates are at high risk of deterioration and are high risk for developing subsequent complications.

Transfer \textbf{must} occur with:

- Any neonate who has required > 1 minute of PPV
- Any infant remaining centrally cyanosed
- Any infant with an Apgar score of 7 or less at five minutes
- Any infant with poor muscle tone 10 minutes after birth.
- Any infant with respiratory distress / grunting > 20 minutes after birth
- Any infant requiring cardiac massage.

**In the event of a transfer:**

- Notify the receiving hospital of the impending transfer and condition of the baby.
- If active resuscitation is required during transfer ensure the receiving hospital is aware and ask them to ensure the paediatric team are available on your arrival.
- The support midwife is to remain with the mother until her transfer to the hospital can occur. Consider calling another support midwife to assist and inform the on-call manager of events.

**When to cease resuscitation attempts:**

The decision to cease resuscitation will only be made by a medical officer. Midwives are expected to continue with full resuscitative measures until such a decision is made.

If the baby is a macerated stillborn identified by broken skin, no cry, no breathing and absence of heart rate then resuscitative procedures are not appropriate. Please refer to CMP Midwifery Protocol –‘Midwifery care when no fetal heart rate has been detected’.

**Documentation**

2. Complete ‘Post Birth Clinical Hand Over/Transfer Document (M285) and give a copy to the receiving hospital.
3. Complete a CIF form.
REFERENCES / STANDARDS
4. Women's and Newborns' Health Network, Policy for Publicly Funded Home Births including Guidance for Consumers, Health Professionals and Health Services, Feb 2012
5. Women and Newborn Health service, NCCU Clinical Guideline, Section 1, 11 –Emergency Procedures, 11.6 Neonatal resuscitation, Resuscitation and Admission, Post Resuscitation Care
6. Women and Newborn Health service, NCCU Clinical Guideline, Section 1, 11 –Emergency Procedures, 11.6 Neonatal resuscitation, 11.6.1 Neonatal external cardiac massage
9. NRP WA Addendum, Andy Gill, 2013

National Standards – 1- Care Provided by the Clinical Workforce is Guided by Current Best Practice

Legislation - Nil
Related Guidelines / Policies – Antenatal care: The Initial Visit
Other related documents – Midwifery care when a Client Makes a Decision that Is Incompatible with the CMP Midwifery Standard of Practice

RESPONSIBILITY

<table>
<thead>
<tr>
<th>Policy Sponsor</th>
<th>Nursing &amp; Midwifery Director OGCCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Endorsement</td>
<td>2008</td>
</tr>
<tr>
<td>Last Reviewed</td>
<td>Sept 2013</td>
</tr>
<tr>
<td>Last Amended</td>
<td>October 2015</td>
</tr>
<tr>
<td>Review date</td>
<td>September 2016</td>
</tr>
</tbody>
</table>

Do not keep printed versions of guidelines as currency of information cannot be guaranteed. Access the current version from the WNHS website.