

Basic newborn resuscitation

About one quarter of all neonatal deaths around the world are as a result of birth asphyxia and the incidence is higher in low-income countries. Risk factors such as poor maternal health and cephalopelvic disproportion, or delays in recognizing, referring or responding to difficulties in labour and birth, put babies in danger of birth asphyxia. However, about half the cases occur where no risk factors were apparently present. Effective resuscitation at birth can prevent a large proportion of the deaths and disabilities associated with birth asphyxia, even in settings with limited resources. All women should be assisted during birth by a person skilled in neonatal resuscitation and with access to the correct and functioning equipment for resuscitating newly-born babies who do not breathe spontaneously.

In 2012, WHO reviewed the scientific evidence and updated guidelines for the resuscitation of newborns in resource-limited settings. These guidelines outline the recommended clinical actions to be taken by health workers. They are designed in a way to allow a single health care provider, such as midwife, to effectively resuscitate a newborn baby. They will help programme managers to develop or adapt national and local guidelines, standards and training materials.

KEY ACTIONS

1. The cord should be clamped after 1 to 3 minutes in all newly-born babies; the cord should be clamped and cut before one minute only if this is needed for resuscitation.
2. If newly-born babies start breathing on their own, suctioning of the mouth and nose and/or trachea should not be performed, even if the baby is born through meconium-stained amniotic fluid.
3. If the mouth of the non-breathing baby is full of secretions preventing effective ventilation, the mouth and nose should be suctioned.
4. If the non-breathing baby is born through meconium-stained amniotic fluid, the mouth and nose (and trachea if possible) should be suctioned before initiating ventilation.
5. Where single use suction catheters are not available, use a bulb syringe to suction the mouth and nose. Tracheal suctioning requires highly skilled personnel and equipment often not available in low-resource settings.
6. In newly-born babies who do not start breathing despite drying and additional stimulation, positive pressure ventilation should be started within one minute.
7. When positive-pressure ventilation is needed in babies, in most cases it should be started with air and using a self-inflating bag and face-mask; in preterm babies born before 32 weeks of gestation, it is preferable to start with 30% oxygen, if this is available.
8. Newly-born babies requiring ventilation should be assessed by measuring heart rate after 60 seconds.
9. In newborn resuscitation providing adequate ventilation is more important than chest compressions.
10. Ventilation should be stopped if the baby has no detectable heart beat after 10 minutes of effective ventilation, or continues to have a heart rate below 60/min and no spontaneous breathing after 20 minutes.

EVIDENCE

In drafting the recommendations for basic newborn resuscitation, the WHO Guideline Development Group considered evidence and critical outcomes with respect to timing of cord clamping; the efficacy of additional stimulation; when and how to suction the baby's mouth and nose or trachea before initiating positive-pressure ventilation; when and with what gas and equipment positive-pressure ventilation should be initiated and how long this should continue for when there are no signs of improvement. Details of the systematic reviews of the scientific literature and full recommendations are available in the *WHO Guidelines on basic newborn resuscitation, 2012 (1)*.

ACTIONS

Policy changes: National policy should clearly state the recommended practices for the management of a newly-born baby who does not breathe spontaneously. Clinical care standards and locally adapted guidelines on newborn resuscitation for each level of care should be available and promoted.

Standards for preventing and managing newborn asphyxia

- All women giving birth should be assisted by a person skilled in newborn resuscitation, with access to the correct equipment for resuscitating newly-born babies who do not breathe spontaneously.
- These skilled birth attendants should be competent to review the partograph and anticipate any risk of intrapartum hypoxia; assess the newborn and normal initiation of breathing; resuscitate and stabilise the newborn if necessary; and correctly use and maintain resuscitation equipment.
- Minimum equipment and supplies for resuscitation should be available, properly maintained, clean and functioning. This includes a heat source or pre-warmed towels, a suction device, a self-inflating bag with 2 face masks of appropriate size for normal and small babies and a clock.
- A functioning referral system, through which skilled attendants are linked to a referral centre offering comprehensive neonatal care for newborns with birth asphyxia, is needed.
- A mechanism must be in place to record the health and care of each newborn. This includes facility records, referral records and baby health cards to ensure continuity of care.
- Newborn babies who have needed resuscitation at the time of birth should be monitored more closely to assess and assist with any breastfeeding difficulties and refer for further care if necessary.

Health worker skills and competencies: When a newborn baby does not breathe spontaneously, skilled resuscitation is needed immediately. For this reason, every skilled birth attendant must be competent and equipped to provide basic newborn resuscitation. Ideally, one person should be available to care for the newborn at the time of birth, while another cares for the mother.

The *WHO recommendations: Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting (2)* state that health worker cadres such as auxiliary nurse midwives can deliver neonatal resuscitation. Programme planners need to consider regulatory issues, training and supervision, as well as referral systems when shifting tasks from one cadre of health worker to another. WHO is updating existing clinical guides (3–6) and training manuals (7), and developing job aids and computer-assisted learning tools which can be

used to ensure that all skilled birth attendants have the necessary competencies to resuscitate newly-born babies.

Because newborn resuscitation is needed relatively infrequently (an incidence of about 5–10% of all births), training programmes should take into consideration the need to retrain birth attendants in order to maintain their skills. Supervision and mentoring of birth attendants, with feedback of routine monitoring data, can help to support and sustain key competencies.

Commodities: All skilled birth attendants, whether assisting women at home or at a health facility, should have the necessary equipment at every birth to carry out newborn resuscitation. Equipment needs to be regularly checked to ensure it is clean and in full working order.

Essential equipment for basic newborn resuscitation

- A heat source and pre-warmed towels to dry baby.
- A suction device: where available, mechanical equipment generating negative pressure and single-use catheters are preferable to bulb syringes; if these are the only option, it must be possible to open them for cleaning and sterilization.
- A self-inflating bag and mask of appropriate size for normal and small babies.
- A clock or watch to measure heart rate and length of time that ventilation was required.
- Documentation to record that resuscitation was required, and progress and outcome.

Community awareness: Increasing community awareness of the risks of birth asphyxia, the importance of skilled care at birth and the potential to prevent death and disability through basic newborn resuscitation should be part of any programme to improve maternal and newborn health. Promoting knowledge of risk factors and the value of having a skilled birth attendant, who can detect and manage birth asphyxia, as well as the importance of referral when danger signs are present, can contribute to improvements in birth outcomes. Women and their families should be encouraged to develop a birth and emergency plan in conjunction with their health provider. This should include practical considerations such as where and with what skilled birth attendant the birth is planned and anticipation of any costs that will be incurred. Women and their families should be aware of the danger signs during pregnancy and birth and develop a plan for emergency transport to a referral centre if complications arise.

Service delivery: The quality of care available through health facilities depends on all of the above conditions being met. In developing a strategy to ensure that every birth is attended by a health worker skilled and equipped to perform basic newborn resuscitation, it is important to consider each of these elements.

IMPACT

At local health facilities and in district health systems the following may be routinely recorded and reviewed:

1. Proportions of birth attendants competent in basic newborn resuscitation.
2. Proportion of health care facilities with maternity services with sufficient and functional resuscitation equipment.
3. Proportion of births assisted by a health care worker skilled and equipped to perform basic newborn resuscitation.

REFERENCES

4. Number of newborns requiring resuscitation and a review of causes (obstetric complications, delays).
 5. Review of referrals due to birth asphyxia, efficiency of referral, including transport time.
 6. Audit of fresh stillbirths and neonatal deaths, possible causes and preventable factors.
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1. WHO. *Guidelines on basic newborn resuscitation*. Geneva: World Health Organization, 2012.
 2. WHO. *WHO recommendations: optimizing health worker roles to improve access to key maternal and neonatal health interventions through task shifting*. Geneva: World Health Organization, 2012.
 3. WHO, et al. *Pregnancy, childbirth, postpartum and newborn care. A guide for essential practice*. Geneva: World Health Organization, 2006.
 4. WHO, et al. *Managing complications in pregnancy and childbirth. A guide for midwives and doctors*. Geneva: World Health Organization, 2003.
 5. WHO, et al. *Managing newborn problems. A guide for doctors, nurses and midwives*. Geneva: World Health Organization, 2003.
 6. WHO. *Pocket book of hospital care for children: guidelines for the management of common illnesses with limited resources*. Geneva: World Health Organization, 2005.
 7. WHO. *Essential newborn care course*. Geneva: World Health Organization, 2010.

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