

# Resuscitation of the term and preterm infant

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## Abstract

Birth is a relatively hypoxic experience that newborns must undertake but this is generally well tolerated. The role of those responsible for Newborn Life Support is to follow best practice guidance to support those babies who need assistance with this transition from intrauterine to extra-uterine life. This article aims to give a practical guide to supporting the transition of both term and preterm infants including the recent changes to the published guidance.

**Keywords** guidelines; infant; neonatal; newborn; premature; resuscitation; transition

## Background

Approximately 10% of newborn infants require some form of assistance at birth, with less than 1% requiring more extensive resuscitation. The need for resuscitation can often be anticipated; in those with evidence of significant fetal compromise, babies delivering before 35 weeks gestation, vaginal breech deliveries, the presence of maternal infection and multiple pregnancies. Additionally, delivery by Caesarian Section is associated with an increased risk of problems with respiratory transition at birth requiring medical interventions. This is especially true for deliveries before 39 weeks gestation.

In October 2015 new guidance for resuscitation at birth was published by the UK Resuscitation Council. This article aims to give a practical guide to resuscitation at birth, giving specific recommendations for those babies born at term and preterm gestations.

Newborn life support (NLS) as stated by the UK Resuscitation Council, comprises the following elements:

- Enabling placental transfusion (when able to do so) by delaying the clamping of the umbilical cord.
- Drying and covering the newborn infant, and where necessary taking additional steps, to maintain a normal body temperature.

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- Assessing the infant's condition and the need for any intervention.
- Maintaining an open airway.
- If the infant is not breathing, aerating the lungs with inflation breaths.
- Continuing ventilation of apnoeic infants until respiration is established.
- Starting chest compressions when the heart rate remains less than 60 per minute after five effective inflation breaths and 30 seconds of effective ventilation.
- Administration of drugs (rarely).

We will take each of these elements in turn, expanding and outlining the differences for management of babies at different gestations.

## Resuscitation and support of transition of term infants at birth

### Be prepared!

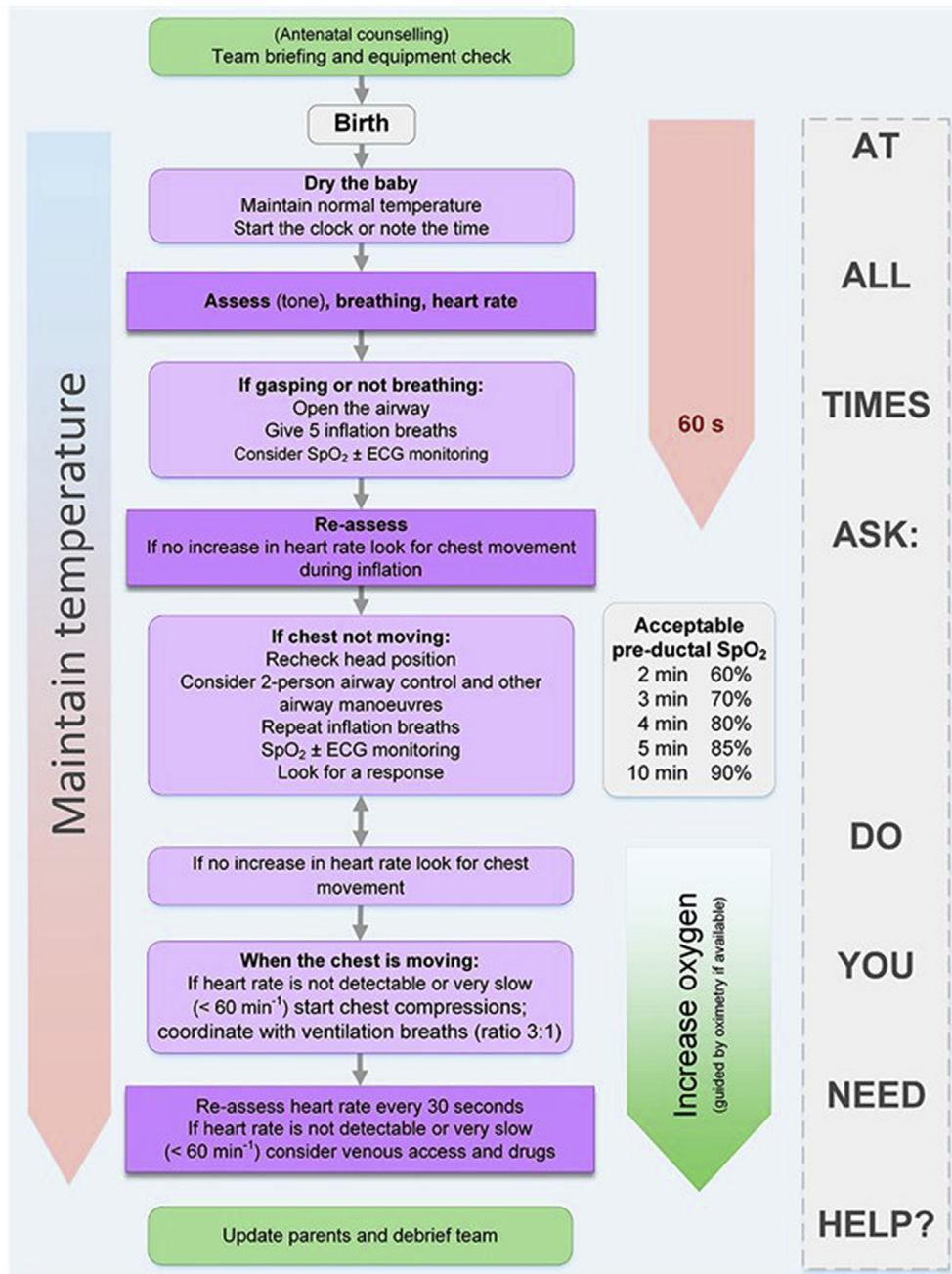
Preparation prior to delivery is the key to success. This includes selecting the team for resuscitation, obtaining a thorough antenatal history, checking the resuscitaire and equipment, communication with parents and the multidisciplinary team. Clear documentation is essential.

A combination of experienced medical and nursing personnel should form the team responsible for resuscitation, with clearly identified roles. As well as the team leader there should be two skilled professionals able to manage the airway and breathing, and the circulation respectively. At least one nurse is required, although two is desirable to check and draw up medications, hand equipment, for time keeping and to undertake timely documentation. In a low resource setting the team may be limited, necessitating the ability to multitask. Clear communication within the team is vital to conform to the fundamental principles of resuscitation.

All doctors who attend newborn deliveries as part of their duties should be trained in Neonatal Life Support (NLS). This provides the necessary skills and knowledge to perform basic resuscitation of a newborn infant, see the NLS algorithm in [Figure 1](#). If the infant has been significantly compromised more advanced resuscitation skills may be required. Situations where this may apply to term deliveries include; thick meconium stained liquor, pathological CTG and antenatally diagnosed congenital anomalies. It is not always possible to glean this information in advance and babies can be born in unexpectedly poor condition. If in doubt, call for help.

### The environment and temperature control

Thermal control has been listed as one of the key changes in the 2015 guidance. It is important to consider the wider environment as part of your preparation. Ideal room temperature for delivery of a newborn, especially those less than 30 weeks' gestation, should be 26 °C or above. The radiant heater should be switched on as soon as possible to preheat and consideration should be made as to whether thermal adjuncts are needed such as a thermal mattress. Evidence supports a correlation with significant morbidity and mortality in infants subjected to unintentional hypothermia. This clearly has more relevance in the preterm



**Figure 1** Newborn Life Support algorithm. Reproduced by kind permission of the Resuscitation Council (UK) from Resuscitation and support of transition of babies at birth: Guidelines 2015.

population but even mild hypothermia, previously thought to be inevitable, is now believed to carry unacceptable risk.

**Cord clamping**

Cord clamping receives a special mention as this is an area of practise that has recently changed. Evidence supports a delay in cord clamping for at least 1 minute after birth as beneficial for uncompromised preterm and term infants. This is felt to represent a more physiological process and has been shown to increase iron stores at 3 months. There is not sufficient evidence at present to make recommendations regarding cord clamping in

significantly compromised babies at birth. In these cases the baby should be brought directly to the resuscitaire for ongoing assessment and resuscitation as necessary.

**Assessment**

The assessment at birth should include heart rate, respiratory effort, colour and tone. This forms the basis of the APGAR score. It is useful to have ECG and pulse oximetry monitoring to improve the accuracy of the assessment of heart rate and oxygenation. Although ECG monitoring can give rapid, accurate and continuous monitoring of the heart rate it does not indicate

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