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**Resuscitation Council (UK)**

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**NEWBORN LIFE SUPPORT****Resuscitation Guidelines 2000****Contents**

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**Introduction**

Passage through the birth canal is, by adult standards, a relatively hypoxic experience for the fetus since significant respiratory exchange at the placenta is prevented for the 50 - 75 seconds duration of the average contraction. Though most babies tolerate this well, some do not and these few may require help to establish normal breathing at delivery. Newborn life support is designed to provide this help and it comprises the following elements: drying and covering the newborn baby to conserve heat, assessing the need for any intervention, airway opening, lung inflation, rescue breathing, chest compressions and, very rarely, the administration of drugs.

**▲ contents****Drying, covering and assessing**

Babies are born small and wet. They get cold very easily especially if they remain wet and in a draught. Whatever the problem first make sure the cord is securely clamped and then dry the baby, remove the wet towels and cover the baby with dry towels. Drying the baby will provide significant stimulation and will give you time to assess the baby's **colour, tone, breathing and heart rate**. Reassess these observations regularly every 30 seconds or so throughout the resuscitation process. Also consider and reconsider whether you require any help and, if so, ask for it immediately.

A healthy baby will be born blue but will have good tone, will cry within a few

seconds of delivery, will have a good heart rate (the heart rate of a healthy newborn baby is about 120-150 beats per minute) and will rapidly become pink during the first 90 seconds or so. A less healthy baby will be blue at birth, will have less good tone, may have a slow heart rate (less than 100 bpm) and may not establish adequate breathing by 90-120 seconds. An ill baby will be born pale and floppy, not breathing and with a slow or very slow heart rate. (The heart rate of a baby is best judged by listening with a stethoscope - in many cases it can also be felt by gently palpating the umbilical cord or by feeling for the apex beat over the anterior chest - feeling for peripheral pulses is not helpful).

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## Airway

If the baby is to breathe effectively then the airway must be open. The best way to achieve this is to place the baby on his back with the head in the neutral position. When in the neutral position the neck is neither flexed nor extended. Most newborn babies will have a relatively prominent occiput which will tend to flex the neck if the baby is placed on his back. This can be avoided by placing some support under the shoulders of the baby. If the baby is very floppy it may also be necessary to apply chin lift or jaw thrust.

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## Breathing

If the baby is not breathing adequately by about 90 seconds give five inflation breaths. Until now the baby's lungs will have been filled with fluid. To inflate lungs in these circumstances will require sustained application of pressures of about 30 cms of water for 2-3 seconds - these are 'inflation breaths'.

In response to these inflation breaths the heart rate should increase from its previous rate. If it does do so then you can assume that you have successfully inflated the chest. If the heart rate increases but the baby does not start breathing for himself then continue to provide regular breaths at a rate of about 30-40 per minute until the baby starts to breathe on his own.

If the heart rate does not increase following inflation breaths then either you have not inflated the chest or the baby needs more help. By far the most likely is that you have failed to inflate the chest. If the chest does not move then you have not inflated it.

Consider:

- Is the baby's head in the neutral position ?
- Do you need jaw thrust ?
- Do you need a longer inflation time ?
- Do you need a second person's help with the airway ?
- Is there an obstruction in the oropharynx (laryngoscope & suction) ?
- What about an oropharyngeal (Guedel) airway ?

Go back and check that the baby's head and neck are in the neutral position, that your inflation breaths are at the correct pressure (30 cms of water) and



applied for the correct time (2-3 seconds inspiration) and that the chest moves with each breath. If the chest still does not move ask for help in maintaining the airway and consider an obstruction in the oropharynx which could be removed by suction under direct vision. An oropharyngeal (Guedel) airway may be helpful. If, following five inflation breaths, the heart rate remains slow (less than 60 per minute) or absent **despite good chest movement** then start chest compressions.

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## Chest compressions

Almost all babies needing help at birth will respond to successful lung inflation with an increase in heart rate and the onset, soon after, of normal breathing. However, in some cases chest compressions are necessary. Chest compressions should only commence after inflation of the lungs. In babies, the most efficient method of delivering chest compressions is to grip the chest in both hands in such a way that the thumbs of both hands can press on the sternum at a point just below an imaginary line joining the nipples and with the fingers over the spine at the back. Compress the chest quickly and firmly in such a way as to reduce the antero-posterior diameter of the chest by about one third. The ratio of compressions to inflations in newborn resuscitation is 3:1 which is different from any other time of life.

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## Drugs

In a very few babies inflation of the chest and effective chest compressions will not be sufficient to produce an effective circulation. In these babies drugs may be helpful. *Drugs are only needed if there is **no significant cardiac output despite effective lung inflation and effective chest compression***. The drugs used are epinephrine (adrenaline) 1:10,000, sodium bicarbonate (ideally 4.2%) and 10% dextrose. If drugs are to be effective in this situation where there is inadequate circulation they must be delivered close to the heart, usually via an umbilical venous catheter. The recommended dose for epinephrine is 10 microgram/kg (0.1 ml/kg of 1:10,000 solution). If this is not effective an increased dose of 30 microgram/kg (0.3 ml/kg of 1:10,000 solution) may be tried. The dose for sodium bicarbonate is between 1 and 2 mmol of bicarbonate per kg (2 to 4 ml of 4.2% bicarbonate solution). If there is no response to an initial dose of epinephrine it is worth repeating the epinephrine after a dose of bicarbonate. The dose of dextrose recommended is 250 milligrams/kg (2.5 ml/kg of 10% dextrose).

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## Further reading

Resuscitation Council (UK) Newborn Life Support Provider Manual, London 2001.

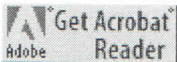
American Heart Association, Emergency Cardiovascular Care Committee

Guidelines. Neonatal resuscitation. Circulation 2000; 102 Suppl I: I 343- I 356

Hamilton P. (Chairman). Resuscitation of Babies at Birth, Royal College of Paediatrics and Child Health, Royal College of Obstetricians and Gynaecologists. BMJ Publishing Group, London 1997. ISBN 0-7279-1179-1

## NLS algorithm

The NLS algorithm is available in Adobe PDF format.

The software to read PDF files is available from 

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For full details of how to contact the Resuscitation Council please [click here](#).

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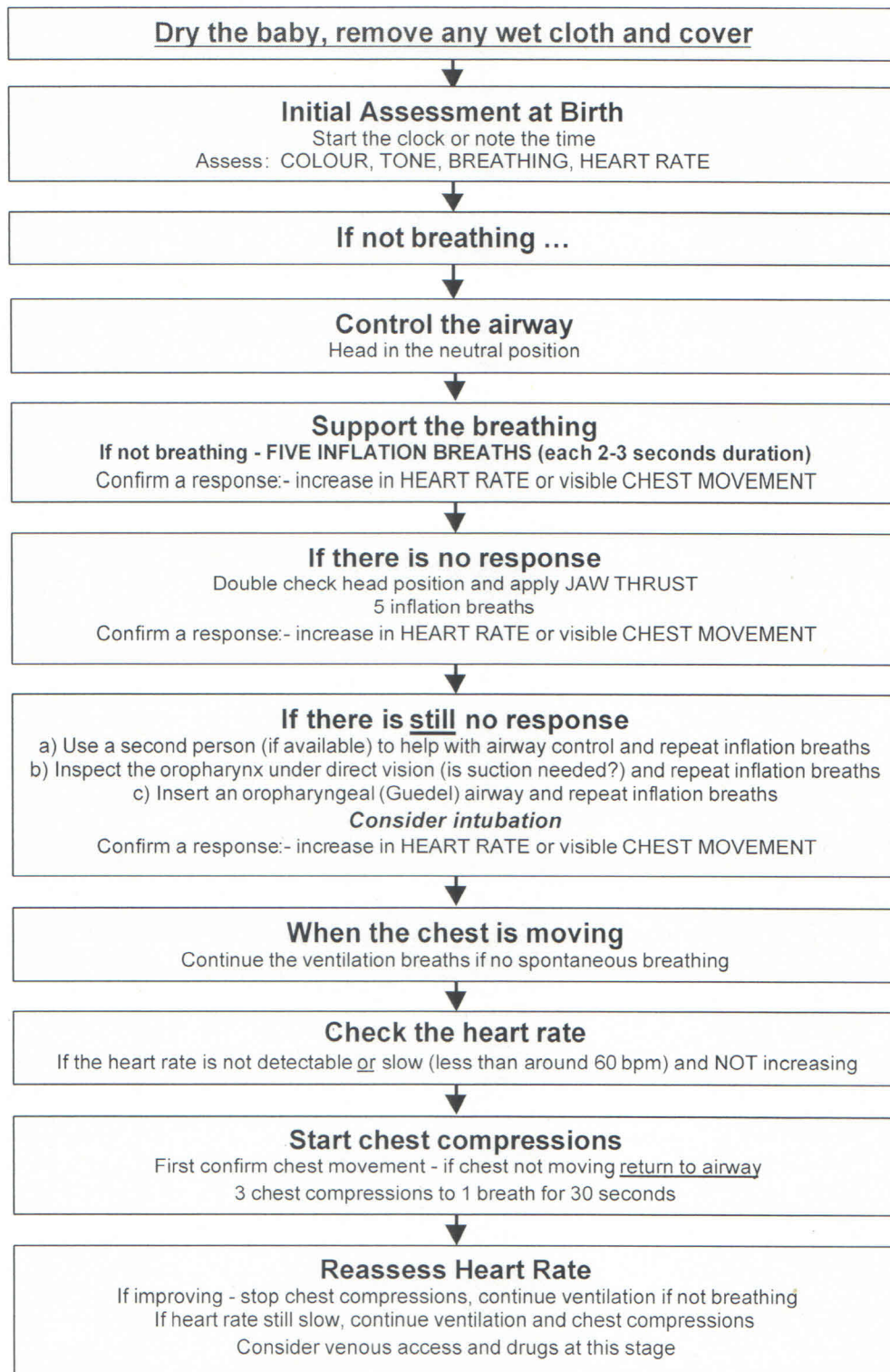
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This page last updated: 18 March 2002

## Newborn Life Support



### AT ALL STAGES, ASK ..... DO YOU NEED HELP ?

In the presence of meconium, remember:      Screaming babies :- have an open airway  
Floppy babies :- have a look