NCCU CLINICAL GUIDELINES
SECTION: 1

RESUSCITATION AND ADMISSION

Section: 1 Resuscitation and Admission
Monitoring guidelines
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Neonatology Clinical Guidelines
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Authorisation and review by
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MONITORING GUIDELINES

HEART RATE

120 – 160
Set limits at 100 – 200 if ventilated, 90 – 190 non-ventilated.
Reduce lower limit if baseline bradycardia evident and infant has been reviewed by a Doctor.

RESPIRATORY RATE

40 – 60
Without grunting, flaring or retractions.

TEMPERATURE

36.5^0C – 37.4^0C
Measured per axilla.

PULSE OXIMETRY

The majority of infants attain SaO2 above 95% within 10 minutes of birth. Therefore a failure to do so should prompt a careful assessment for underlying pathology.

Oxygen is a common therapy for very preterm and sick infants. Although it has clearly been associated with significant improvements in neonatal survival and disability, its by-products – free radicals and reactive oxygen species can cause tissue injury and have been associated with ROP and probable oxidative damage in other organs (brain and lung). A number of trials have been undertaken to better define the best oxygen saturations to target in preterm infants, balancing the risk of ROP (with higher saturations) and the risk of pulmonary hypertension and death (with lower saturations). On current evidence our decision is to target preterm infant's oxygen saturations to be 91-95% until they reach 37 weeks CGA.

Gestation	Target Saturations	Alarm limits
< 37weeks	91-95%	90-96%
≥ 37 weeks	94 –97%	93-98%
Different target saturations and alarm limits may be ordered for individual infants with specific problems such as congenital heart disease, congenital diaphragmatic hernia and PPHN and babies with difficult ventilation. If using a different target range please document in the medical progress notes the target range and reasons.		

Monitor as follows:

1. Infants with respiratory distress or compromise.

2. Infants until they reach 34 weeks CGA (unless otherwise documented).
3. Monitor for a further five days after supplemental oxygen has been ceased.
4. Stable infants being discharged home on oxygen may have Sa02 once per shift for two hours.
5. Infants receiving a course of caffeine and for a minimum of 5 days following cessation of caffeine.
6. NAS infants receiving PO Morphine >0.9mg/kg/day.

CARDIAC MONITORING

1. All ventilatory assisted infants.
2. All infants with apnoea and bradycardia of prematurity - required for 48 hours after last episode of bradycardia.
3. Infants receiving a blood transfusion. Remove 2 hours after completion of transfusion.
4. At risk infants having 1st triple immunization, monitor for 48hrs.
5. Investigation of cardiac arrhythmia.
6. All infants until reaching 32 weeks CGA.

BLOOD PRESSURE MONITORING

There is no consensus on exact definition of hypotension. Normal blood pressure in preterm infants is difficult to define and is based on small numbers. Blood pressure needs to be considered along with history of birth asphyxia, signs of adequate organ perfusion, which include metabolic acidbase balance, urine output and skin perfusion (capillary refill time).

Estimates of systemic blood flow may be obtained from cardiac echo, this is a better measure of perfusion. An echocardiogram should be part of the investigation of low blood pressure and can be used to re-evaluate any treatment instituted.

Blood pressure increases with gestation, birthweight and postnatal age, particularly over the first 24 hours of life.

1. NEW ADMISSIONS

Monitor on admission and hourly until stable (can omit non-invasive BP if an arterial line is to be promptly inserted)

2. UNSTABLE INFANTS – MONITOR HOURLY

- Cardiac disease
- Renal disease
- Infants on inotropes

3. POST OPERATIVE

See Section 13: Surgical Conditions - General Post Operative Care

NON - INVASIVE BP MONITORING IN STABLE INFANTS.

- Infants born <32 weeks gestation or <1250g and who are <1 week of age - BD
- Infants born <32 weeks or <1250gm and who are >1 week old - daily.
- Infants receiving steroid therapy (including Budesonide) – 8hrly then daily when dose weaning.
- Infants with O_2 dependant, > 28 days of age, weekly

- Infants receiving oral morphine > 0.9mg/kg/day - BD.
- Infants on other vasoactive drugs, captopril, sildenafil, thyroxine, steroids, diuretics, diazoxide – BD/daily as ordered

Factors affecting the reliability of readings include:

- Size and fit of cuff - Cuff must be attached snugly and cover 2/3 of the limb. Can use either arm or leg.
- State of alertness or agitation of the infant - After cuff application, allow a rest period to ensure the infant is in a restful state when measurement is taken.
- Non-invasive BP may over-estimate BP measurements in VLBW
- With in-dwelling arterial lines
    - Small air-bubbles may effect measurement
    - Peripheral lines tend to read higher than umbilical lines
    - Occlusion of the tip of the catheter (vessel wall or clot) may dampen the wave and underestimate BP

OBSERVATION FREQUENCIES

FULL OBSERVATIONS - HOURLY

- New admissions - first 3 hours - then reassess.
- Infants with unstable vital signs.
- Infants receiving blood transfusion (*see section 9: Administering Blood Transfusion for extra observations needed pre, during transfusion*).

FULL OBSERVATIONS – 3 OR 4 HRLY/COINCIDE WITH CARES AND FEEDS

- Infants who are tachypnoeic >60 bpm or tachycardic >160 bpm
- Following triple antigen and Hib vaccine - for 48 hours.
- Infants receiving antibiotics.
- Infants with feed intolerance.
- Infants with symptomatic patent ductus arteriosus.
- Infants receiving phototherapy.

FULL OBSERVATIONS – 6 OR 8 HRLY/COINCIDE WITH ALTERNATE CARES/FEEDS

- Stable infants receiving enteral feeds.
- Stable infants receiving oxygen therapy – and for 5 days after ceasing oxygen.
- Stable infants receiving caffeine therapy - and for 5 days after ceasing caffeine.

MINIMUM OBSERVATIONS

Temperature with each feed is performed on infants ready for discharge/level 1 care infants.

FURTHER READING

Oxygen saturation and outcomes in preterm infants. BOOST II United Kingdom Collaborative Group; BOOST II Australia Collaborative Group; BOOST II New Zealand Collaborative Group, Stenson BJ, Tarnow-Mordi WO, Darlow BA, Simes J, Juszczak E, Askie L, Battin M, Bowler U, Broadbent R, Cairns P, Davis PG, Deshpande S, Donoghoe M, Doyle L, Fleck BW, Ghadge A, Hague W, Halliday HL, Hewson M, King A, Kirby A, Marlow N, Meyer M, Morley C, Simmer K, Tin W, Wardle SP, Brocklehurst P. N Engl J Med. 2013 May 30;368(22):2094-104. doi: 10.1056/NEJMoa1302298. Epub 2013 May 5.

Manual of Neonatal Care (7th Ed. 2012). Cloherty et al. (Eds).