



CLINICAL GUIDELINE	
Monitoring and Observation Frequency	
Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

This document should be read in conjunction with this [DISCLAIMER](#)

Contents

Pulse Oximetry	2
Cardiac Monitoring	3
Blood Pressure Monitoring	3
Observation Frequency	4
Appendix – Normal Blood Pressure Limits	6

Vital Sign	Range	Comment
Heart Rate	120-160	Set alarm 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°C-37.4°C	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.

Key Points

- If oximeter insitu on admission, probe must be released and circulation assessed prior to reapplying probe. Assessment to be documented in comments section of MR489/491.
- Oximeter probe to be placed on right hand on admission – pre-ductal.
- Oximeter probe is to be re-sited at least 2- 4 hourly. Document on MR489/491 location of new site (eg. ® LH = re-sited left hand, ® RF = re-sited right foot).
- Do not overtighten strappit – observe hand or foot for swelling, colour change and perfusion.

Gestation	Infants receiving O₂ Therapy Target Saturations	Infants receiving O₂ Therapy Alarm Limits	Infant Self Ventilating in Room Air
< 37 weeks	91-95%	90-96%	90-100%
> 37 weeks	94-97%	93-98%	93-100%

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 infants with difficult ventilation.

If using a different target range please document in the medical progress notes the target range and reasons.

Oxygen Saturation Monitor as follows:

- Infants with respiratory distress or compromise.
- Preterm infants until they reach 34 weeks CGA (unless otherwise documented): this should be then be reviewed daily on ward round until monitor can be ceased.
- Monitoring can be ceased a minimum of 5 days after stopping caffeine and when there are no significant apnoea's. Mild self-limiting desaturation in well infants is not an indication to continue monitoring.
- The use of histograms to see the average saturations is recommended.
- Monitor for a further five days after supplemental oxygen has been ceased for infants with chronic lung disease.

- Respiratory distress for <24 hours (TTN), monitor for a minimum of 4 hours after ceasing respiratory support.
- Stable infants being discharged home on oxygen may have SaO₂ once per shift for two hours.
- Infants receiving a course of caffeine and for a minimum of 5 days following cessation of caffeine.
- NAS infants receiving PO Morphine > 0.9 mg/kg/day.
- Infants nursed prone (i.e. Neural tube defect).

Cardiac Monitoring

- All infants with respiratory support (ventilated, CPAP, HHF).
- All infants with apnoea and bradycardia of prematurity - required for 48 hours after last episode of bradycardia.
- Infants receiving a blood transfusion. Remove 2 hours after completion of transfusion.
- Infants having 8 week and 16 week immunisation, monitor for 48 hours.
- Investigation of cardiac arrhythmia.
- All preterm infants until 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 includes metabolic acid base balance, urine output and skin perfusion (capillary refill time).

Estimates of systemic blood flow may be obtained from cardiac echocardiogram; 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.

See [Appendix A – Blood Pressure Normal Limits](#)

New Admissions

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

Any Unstable Infant - Monitor Hourly

Other infants requiring hourly monitoring include

- Cardiac disease.
- Renal disease.
- Infants on inotropes.

Post-Operative

Refer to [Post-Operative Care](#).

Non-Invasive BP Monitoring in Stable Infants

- Infants born < 32 weeks gestation or < 1250 grams and who are < 1 week of age - BD.
- Infants born < 32 weeks or < 1250 grams and who are > 1 week old - daily.
- Infants receiving steroid therapy (including Budesonide) - 8 hourly then daily when dose weaning.
- Infants with O₂ dependency, > 28 days of age, weekly.
- Infants receiving oral morphine > 0.9 mg/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 - Temperature, Heart Rate, Respiratory Rate**Full Observations - Hourly**

- New admissions - first 3 hours - then reassess.
- Infants with unstable vital signs.
- Infants receiving blood transfusion (refer to [Blood and Blood Products: Administration](#) for extra observations needed pre and during transfusion).

Full Observations - 3 or 4 Hourly / 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 Hourly / 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 in the NICU

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

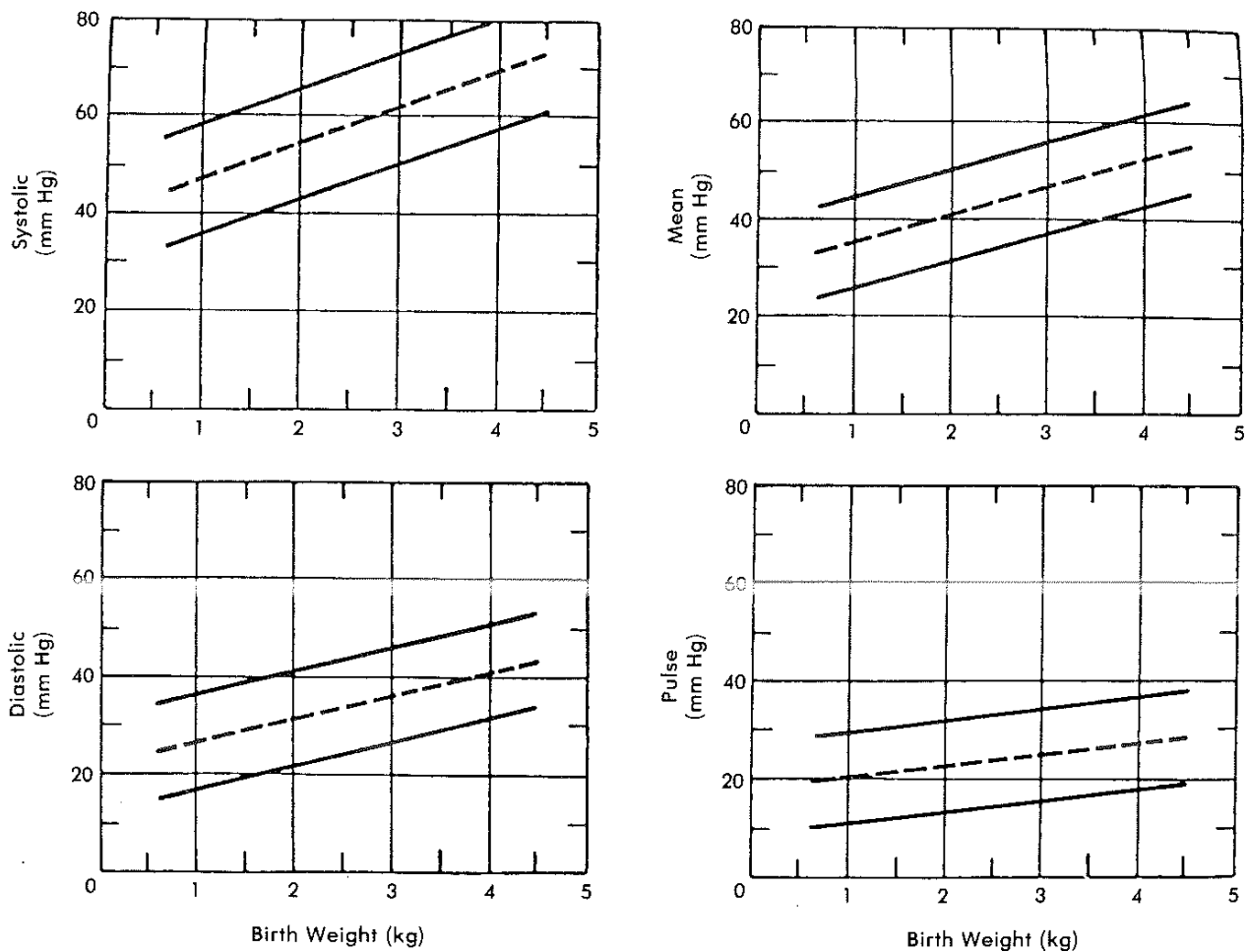
Related CAHS internal policies, procedures and guidelines
Post-Operative Care Pre-Operative Care Blood and Blood Products: Administration

This document can be made available in alternative formats on request for a person with a disability.

File Path:			
Document Owner:	Neonatology		
Reviewer / Team:	Neonatal Coordinating Group		
Date First Issued:	June 2006	Last Reviewed:	11 th March 2019
Amendment Dates:	20 th November 2019	Next Review Date:	11 th March 2022
Approved by:	Neonatal Coordinating Group	Date:	26 th March 2019
Endorsed by:	Neonatal Coordinating Group	Date:	26 th March 2019
Standards Applicable:	NSQHS Standards:   		
Printed or personally saved electronic copies of this document are considered uncontrolled			

Appendix 1: Blood Pressure Normal Limits

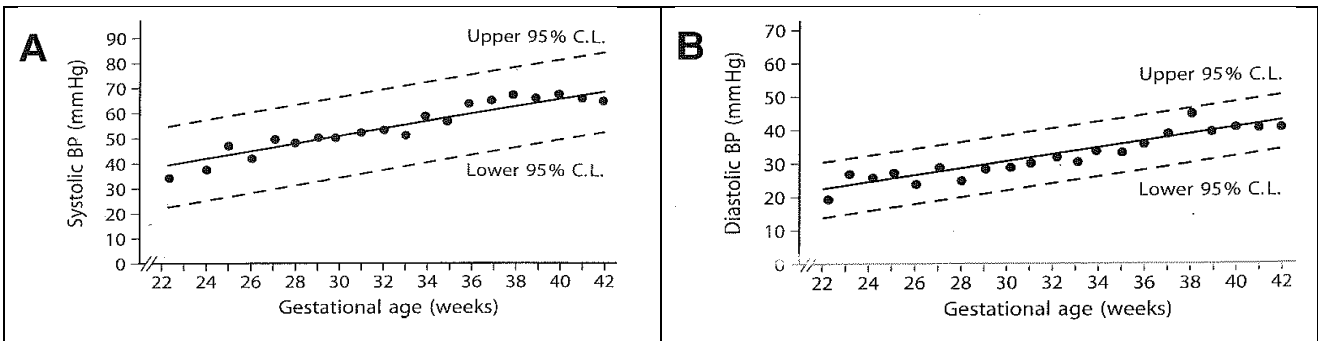
Mean Systolic, Diastolic and Mean Aortic Blood Pressures and Mean Pulse by Birthweight During the 1st 12 Hours of Life (Versmold et al) [1]



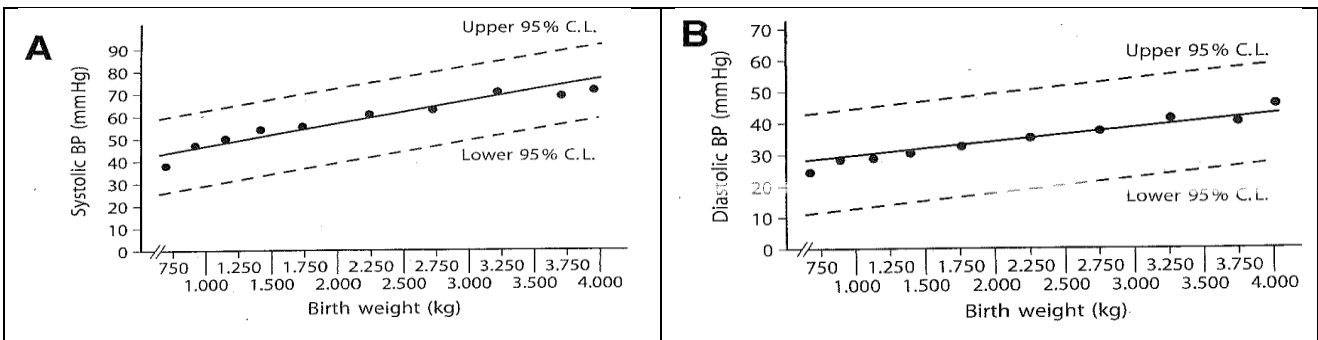
Blood Pressure Ranges in Preterm Infants by Weight during the First Hours of Life (Hegyri et al) [2]

BIRTHWEIGHT (g)	<i>n</i>	SYSTOLIC (mm Hg)	DIASTOLIC (mm Hg)
501-750	18	50-62	26-36
751-1000	39	48-59	23-36
1001-1250	30	49-61	26-35
1251-1500	45	46-56	23-33
1501-1750	51	46-58	23-33
1751-2000	61	48-61	24-35

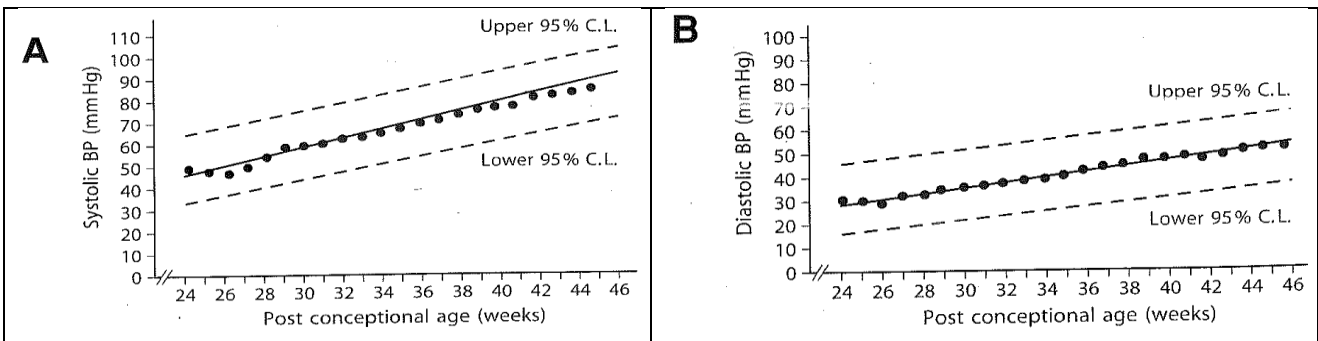
Mean Systolic (A) and Diastolic (B) Blood Pressures by Gestational Age on Day 1 of Life (Zubrow et al) [3]



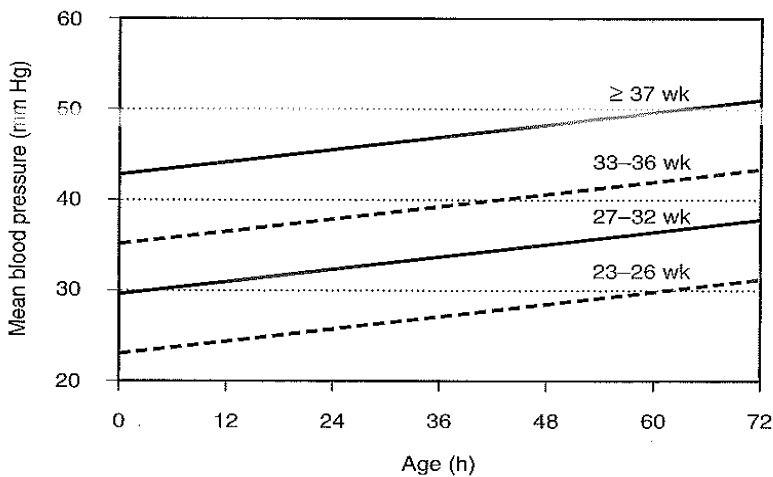
Mean Systolic (A) and Diastolic (B) Blood Pressures by Birthweight on Day 1 of Life (Zubrow et al) [3]



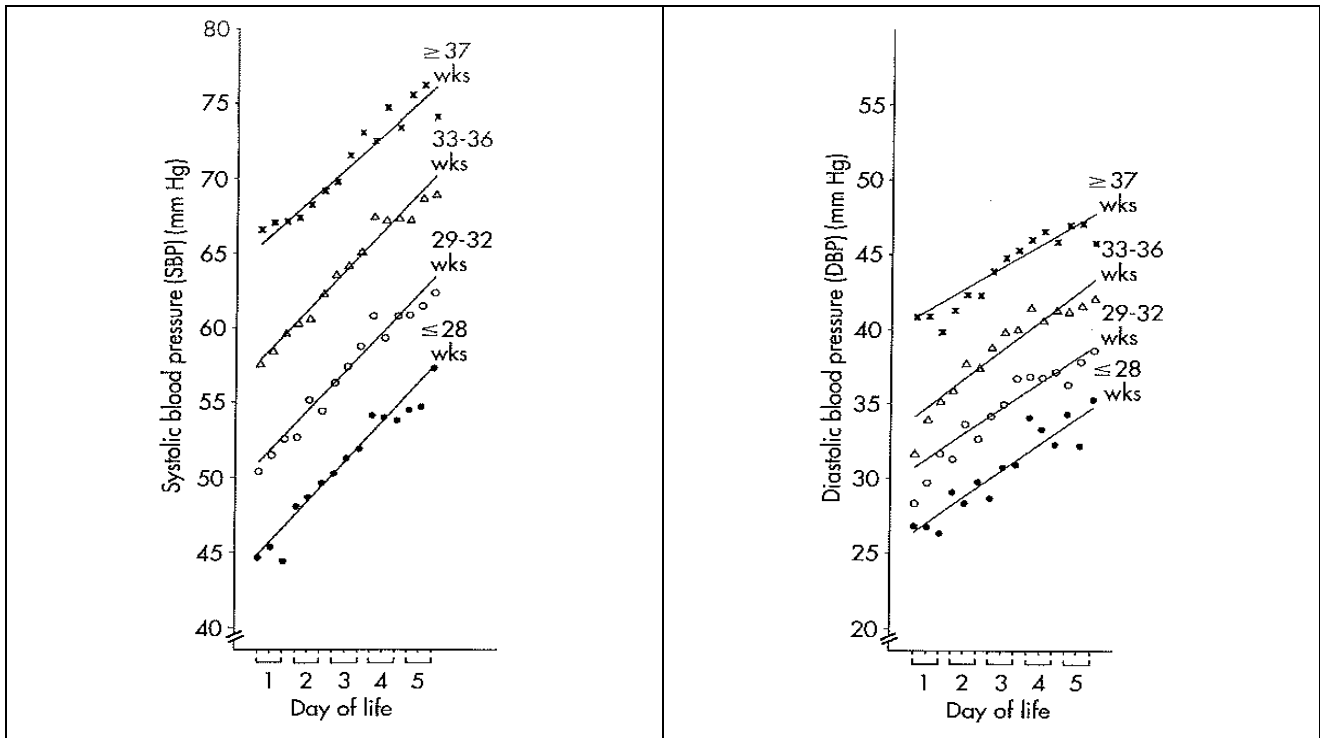
Mean Systolic (A) and Diastolic (B) Blood Pressures by Postconceptional Age in Weeks (Zubrow et al) [3]



Mean Blood Pressure by Gestational Age Over the 1st 72 Hours of Life (Nuntnarumit et al) [4]



Mean Systolic and Diastolic Blood Pressures by Gestational Age Over the 1st 5 Days of Life (Zubrow et al) [3]



Age-Specific Percentiles Of Blood Pressure Measurements In Boys (A) And Girls (B) Birth To 12 Months (Report Of The Second Task Force On Blood Pressure Control In Children—1987, Pediatrics Vol 79, 1987)

