



GUIDELINE

**Monitoring, Observation and Measurement
Frequency**

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

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

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Aim

To provide appropriate monitoring (including weight, growth and fluid balance) depending on level of care, risk and acuity of the infant.

Risk

Inappropriate monitoring of infants will delay appropriate response/s to deterioration of the patient.

Vital Signs Parameters

Vital Sign	Range	Comments
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 90% 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). Several 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.

Oximetry screening to detect critical cardiac disease for infants >35 weeks should occur around 24 hours for any infants who are in SCN. See [Pulse Oximetry Screening to Detect Critical Congenital Heart Disease](#).

Key points

- If oximeter is in-situ on admission, the probe must be released, and circulation assessed prior to reapplying probe. Assessment is to be documented in the comments section of MR489/491.
- Oximeter probe is 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 (e.g. ® 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 O ₂ Therapy Target Saturations	Infants receiving O ₂ 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.

Different target ranges **MUST** be document in the medical progress notes by the treating doctor.

Oxygen Saturation Monitor as follows:

- Monitor all infants with respiratory distress or compromise.
- Preterm infants until they reach 34 weeks CGA (unless otherwise documented): this should then be reviewed daily on ward round until monitor can be ceased.
- Infants receiving caffeine.
 - For infants receiving caffeine, monitoring can be ceased a minimum of 5 days after stopping 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.
- For infants with chronic lung disease, monitor for a further five days after supplemental oxygen has been ceased.
- 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.
- 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 (NOTE, these infants remain on oxygen saturation monitoring as per above).

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 BP 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
- PPHN
- Septic shock

Post-Operative

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

Frequency	Comments
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8 hourly	Infants receiving steroid therapy (including Budesonide) - 8 hourly then <u>daily when dose weaning</u>
Twice daily (BD)	Infants born < 32 weeks gestation or < 1250 grams and who are < 1 week of age
	Infants receiving oral morphine > 0.9 mg/kg/day
Twice daily/ daily	Infants on vasoactive drugs, Sildenafil, Thyroxine, steroids, diuretics, Diazoxide. <u>As ordered by medical staff</u>
Daily	Infants born < 32 weeks or < 1250 grams and who are > 1 week old
Weekly	Infants with O ₂ dependency, > 28 days of age, weekly (usually on a Sunday)
Medication requiring specific monitoring	NOTE: Review Neonatology medication monographs for medications requiring specific BP monitoring, such as antihypertensives, hydrocortisone, anticonvulsants.

Non-Invasive BP Monitoring in Stable Infants

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 affect 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.

Cares and observations

Cares is the term used to describe the bundle of nursing care given to the neonate. Cares usually coincide with enteral feed times or at regular intervals as determined by the patient's clinical status if nil by mouth.

Infant cares include:

- [Developmental positioning](#)
- Nappy changes
- Mouth care
- CPAP Hat releases if relevant

- Repositioning of SpO2 probe and temperature probe if nursed on warmer or incubator on infant servo control (ISC)
- Application of [coconut oil](#) if < 30 weeks gestation
- Bathing, weighing and measuring.

Over handling of the infant can lead to physiological changes¹ including:

- Episodes of desaturation
- Increased oxygen requirements
- Bradycardia
- Tachycardia
- Apnoea
- Hypothermia

Observations should be taken before cares. Axillary temperature (if required) is to be taken before handling to make adjustments to heat output if necessary. Document on MR489 any changes in clinical status. Encourage parental participation in cares. The [Developmental Care: Reducing Environmental Stimuli](#) outlines the importance of developmental care for the neonatal patient.

Observation Frequencies - Temperature, Heart Rate, Respiratory Rate

Full Observations – Hourly (includes blood pressure)

- New admissions - first 3 hours - then reassess.
- Infants with unstable vital signs.
- Infants receiving blood transfusion (refer to [Blood and Blood Products: Administration](#) for observations required 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.
- Stable infants receiving caffeine therapy - and for 5 days after ceasing caffeine.

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.

Minimum Observations in the NICU

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

Weight, Length and Head Circumference Measurements

All head circumferences, lengths and weights are to be plotted on MR415.01/.02 and documented on MR489/491.

Weight

Changes in infant weight provide some indication of growth and fluid balance. Acute changes in fluid balance may be reflected in changes in daily weights, while growth is better reflected in changes in body weight over time.

- All infants are to be weighed on admission to, and discharge from the NICU.
- Discuss timing of weight checks with parents to facilitate parental involvement, weights to be done during the day.
- Infants requiring intensive care are to be **weighed daily** for the first week of life. Then alternate day weight unless otherwise ordered.
- Infants on respiratory support are to be weighed by two nurses. Neonatal trained nurses should be involved in weighing ventilated infants. Unstable infants should be nursed on warmer or incubator with built in scales.
- The shift coordinator is to identify unstable infants and assess unit workload. If deemed unsafe, weighing to be deferred to a more suitable time.
- Level 2 care infants are weighed daily for the first week of life, then **weighed twice per week** e.g. Wednesdays and Sundays. Discuss with parents timing of weight to facilitate parental participation.
- **Surgical** infants are weighed **daily** until otherwise directed by medical staff.
- Daily weighing of stable infants may cause concern over clinically insignificant weight losses/gains and can be particularly unhelpful as infants near discharge.
- If [washing / bathing](#) is required at the same care time as weighing, infants should be weighed first, to minimise thermal stress.
- All weights are to be plotted on MR415.01/.02 and documented on MR489/491.00

Length and Head Circumference

- Discuss timing of measurements with parents to facilitate parental involvement.

- Changes in infant length and head circumference (HC) provide important information regarding growth as opposed to fat deposition.
- All infants should have their HC and length measured at admission. Document on MR415.01/.02 and MR489/491.00
- HC and length are then measured weekly on Sundays (if clinically appropriate) and at time of discharge or transfer.
- Inform Medical staff of unexpected changes in HC.
- If more frequent HC are indicated (e.g. hydrocephalus), it should be measured by the same person (where possible) for consistency.

Related CAHS internal policies, procedures and guidelines

Neonatology Clinical Guidelines

[Blood and Blood Products: Administration](#)

[Developmental Care: Reducing Noxious Stimuli \(health.wa.gov.au\)](http://health.wa.gov.au)


[Post-Operative Care](#)

[Pre-Operative Care](#)

[Pulse Oximetry Screening to Detect Critical Congenital Heart Disease](#)

References and related external legislation, policies, and guidelines

1. Steggerda SJ, Meijler G. Neonatal cerebellar haemorrhage. In: UpToDate, Martin R (Ed), Wolters Kluwer. (Accessed on December 24, 2024.)

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Endorsed by:	Neonatology Coordinating Group	Date:	
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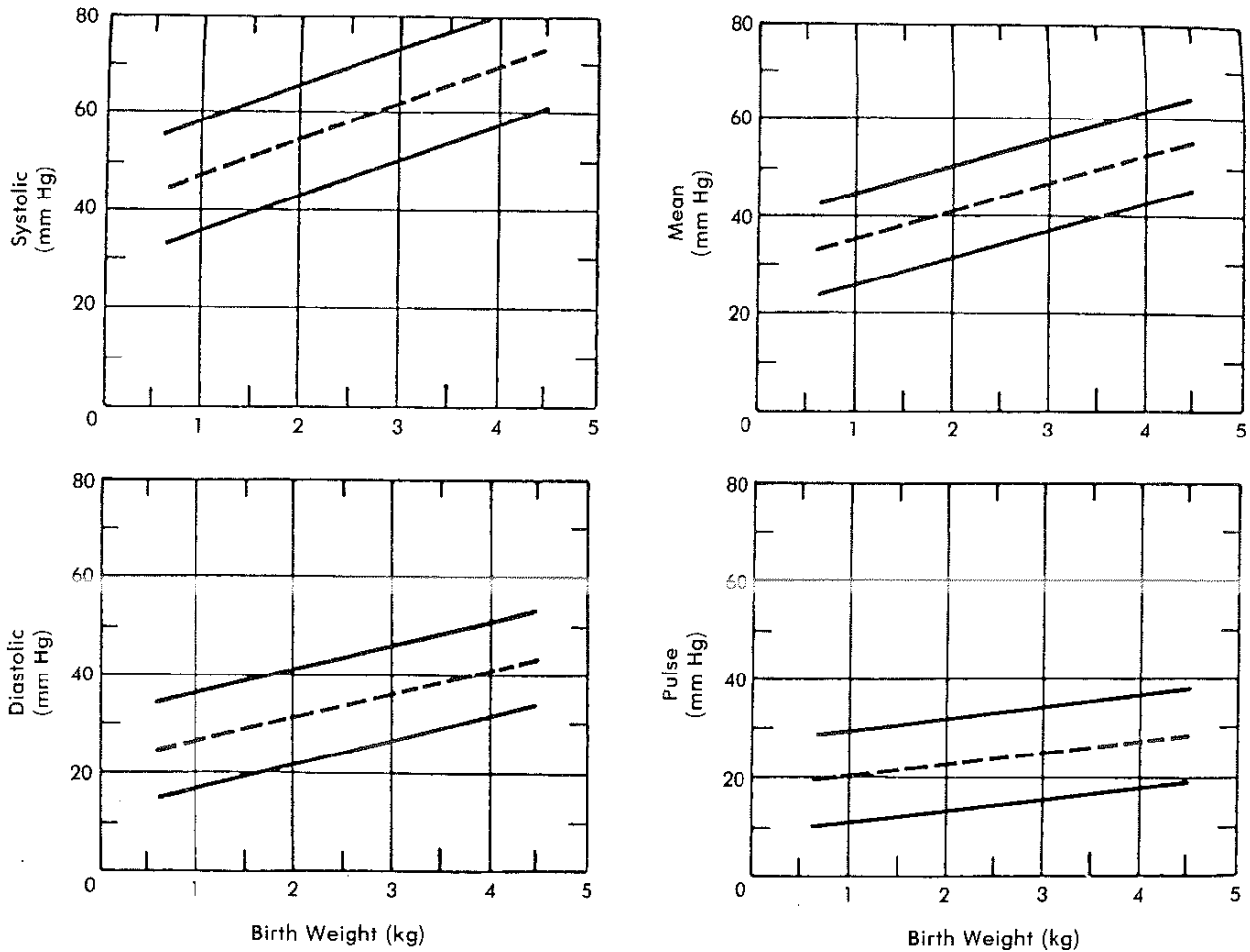
Healthy kids, healthy communities

Compassion
Excellence
Collaboration
Accountability
Equity
Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital

Appendix 1: Blood Pressure Normal Limits

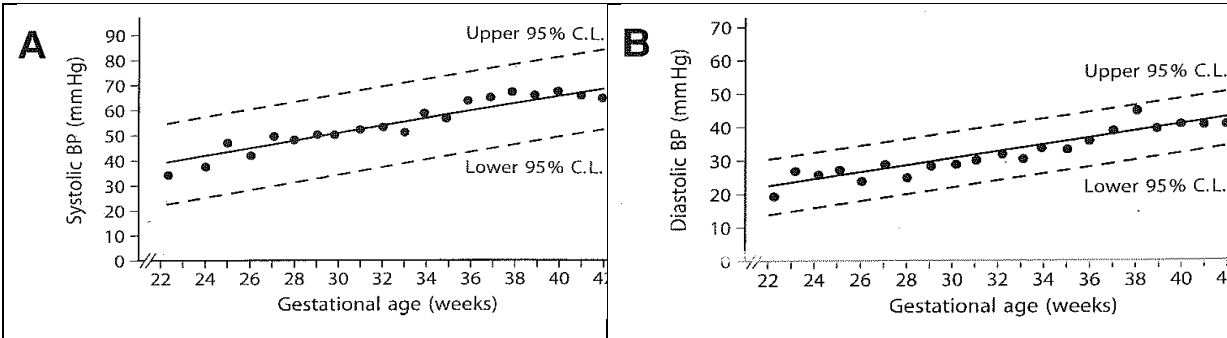
Mean Systolic, Diastolic and Mean Aortic Blood Pressures and Mean Pulse by Birthweight During the 1st 12 Hours of Life (Versmold et al) [1]



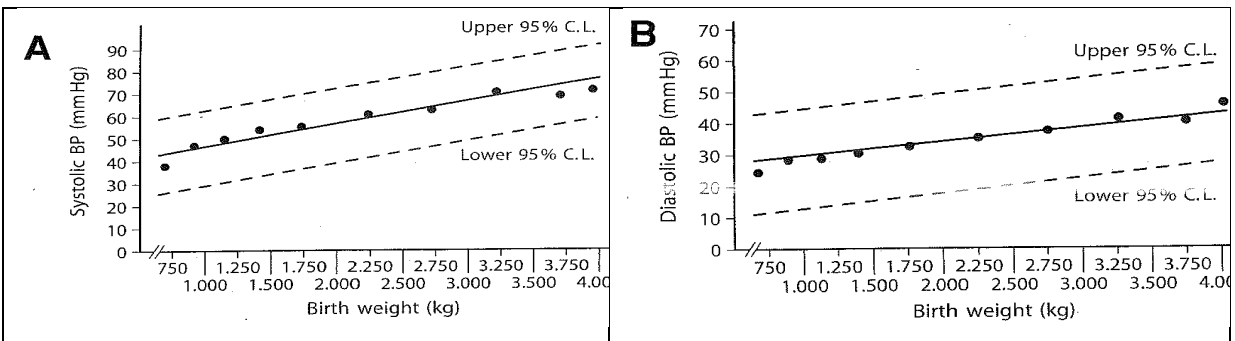
Blood Pressure Ranges in Preterm Infants by Weight during the First Hours of Life (Hegyri et al) [2]

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

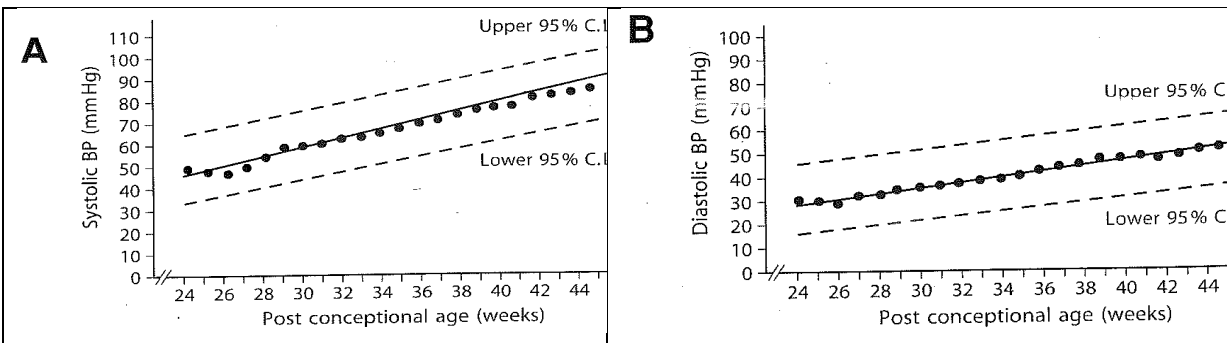
Mean Systolic (A) and Diastolic (B) Blood Pressures by Gestational Age on Day 1 of Life (Zubrow et al) [3]



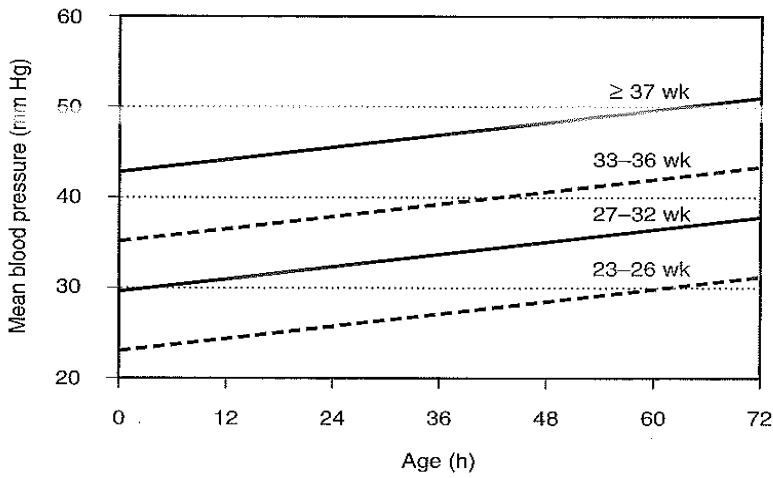
Mean Systolic (A) and Diastolic (B) Blood Pressures by Birthweight on Day 1 of Life (Zubrow et al) [3]



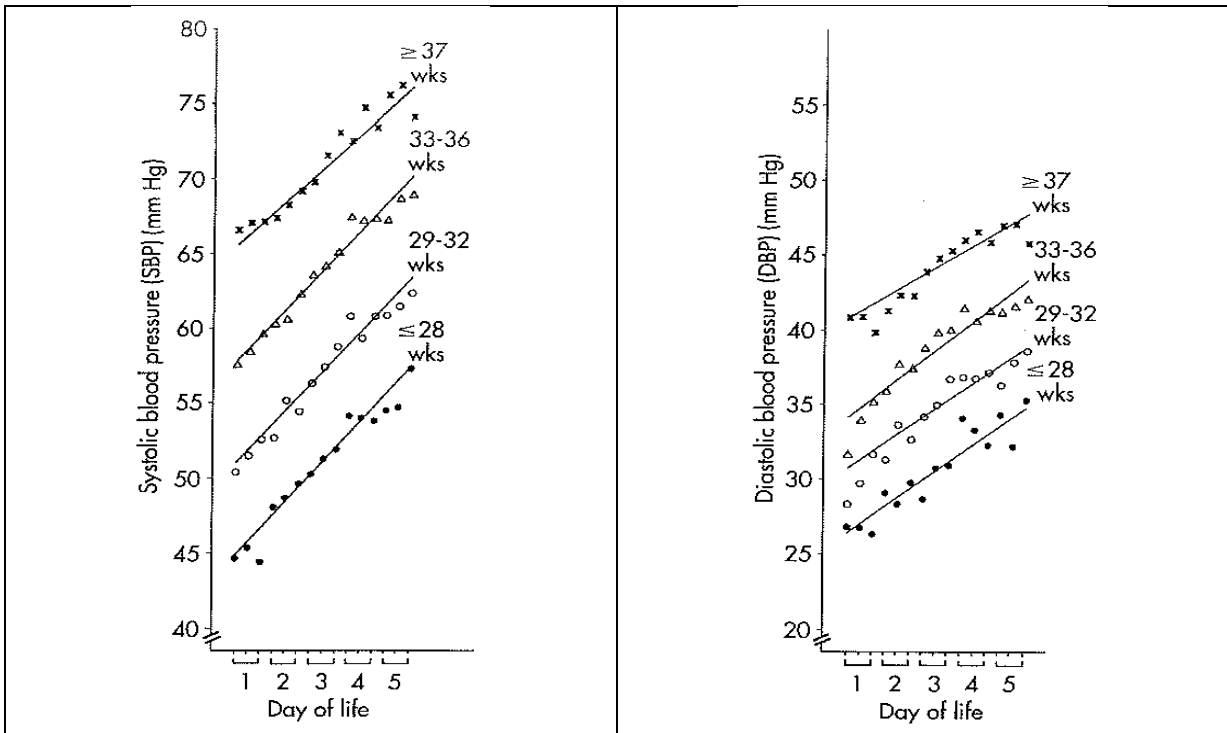
Mean Systolic (A) and Diastolic (B) Blood Pressures by Postconceptional Age in Weeks (Zubrow et al) [3]



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)

