Royal Hospital for Women (RHW)
NEONATAL BUSINESS RULE
COVER SHEET

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NAME OF DOCUMENT	Neonatal Jaundice – Management in Neonates <32 Weeks Gestation
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FORMER REFERENCE(S)	Neonatal Jaundice – Management in Infants <32 weeks. NSW Health GL2016-027: Neonatal – Jaundice Identification and Management in Neonates ≥32 weeks gestation.
EXECUTIVE SPONSOR	Sally Wise, Nursing Co- Director Neonatal Services Srinivas Bolisetty, Medical Co- Director Neonatal Services
AUTHOR	D Nair Sudhaharan (Fellow), S Bolisetty (Medical Co- Director)
SUMMARY	To guide clinicians in the identification and management of unconjugated jaundiced neonates below 32 weeks gestation
Key Words	Jaundice, Phototherapy, hyperbilirubinemia, neonate

Contents

Within this document we will use the term woman, this is not to exclude those who give birth and do not identify as female. It is crucial to use the preferred language and terminology as described and guided by each individual person when providing care.

1 BACKGROUND

Jaundice is one of the most common medical conditions requiring medical attention in newborns. While the cause is mostly physiological, co-existing pathological causes and high levels of bilirubin need to be identified as they may have serious consequences if left untreated. Preterm and sick newborns are more vulnerable to brain toxicity from high bilirubin levels.

The aim of this CBR is to provide a framework for the early identification and management of jaundice in neonates <32 weeks gestation at birth.

2 RESPONSIBILITIES

2.1 Staff

2.1.1 Medical- examine neonates as required, identify neonates with jaundice, order and carry out required investigations, plot bilirubin levels on phototherapy chart, prescribe phototherapy treatment, manage neonates receiving phototherapy, cease phototherapy when indicated, escalate treatment for jaundice when required, liaise with Sydney Children's Hospital (SCH) gastroenterology team as required.

2.1.2 Nursing- examine neonates as required, identify neonates with jaundice, carry out required investigations, plot bilirubin levels on phototherapy chart, initiate prescribed phototherapy treatment, manage neonates receiving phototherapy, cease phototherapy as prescribed, escalate treatment for jaundice when required.

2.1.3 SCH Gastroenterology team- provide consultation and management plans for neonates with conjugated hyperbilirubinemia when required.

3 PROCEDURE

3.1 Equipment

- Drager Photo- Therapy 4000
- Drager Bililux
- GE Bili- soft blanket
- Disposable blanket cover (small or large)
- Disposable eye protection mask (correct size for neonate)
- Neonatal Jaundice Threshold Graphs (appropriate graph for gestation) (Appendix 2-10)
- Serum, full blood count (FBC) tubes, blood gas

3.2 Clinical Practice

3.2.1 Screening for Jaundice (Appendix 1)

3.2.1.1: All neonates

- Medical or nursing staff should visually examine the baby for jaundice at least every 12 hours in the first 72 hours of life or until discharge.
- Check for any risk factors that can cause significant jaundice soon after birth. These include:
  1. Previous sibling with neonatal jaundice requiring phototherapy
  2. Visible Jaundice within the first 24 hours of life
  3. Rhesus negative babies (Rhesus incompatibility)
  4. O blood group mothers (ABO incompatibility)
  5. Family history or genetic ancestry of red cell disorders (including G6PD deficiency)
  6. Delayed cord clamping
  7. Growth restricted neonates (increased risk of polycythaemia)
  8. Twin-twin transfusion syndrome
  9. Birth trauma (including bruising, haematoma, and haemorrhages)
  10. Lower gestational age (increased risk with each additional week below 40 weeks)
  11. Trisomy 21
  12. Macrosomic neonate of diabetic mother

- Serum bilirubin (SBR) or blood gas bilirubin may be used in any neonate that is visibly jaundiced especially if <24 hours of life or having risk factors.

3.2.1.2 Additional care if jaundice is visible in the first 24 hours of life

- Obtain SBR urgently (within 2 hours) and record.
- Urgent medical review and investigations including:
  - Review of mother's blood group and Rhesus status and neonate's blood group and typing and direct anti-globulin test (DAT or direct coombs' test) and
  - FBC to rule out haemolysis from blood group incompatibility and haemoglobinopathies.

NOTE:
Glucose-6-Phosphate Dehydrogenase (G6PD) screening is performed when unconjugated jaundice is recurrent, especially if neonate is male, there is a family history of G6PD or at the medical officer's discretion.

3.2.2 Management of hyperbilirubinemia

- Use SBR to determine therapy.
- Do not subtract conjugated bilirubin from total serum bilirubin (TSB) when making decisions about the management of hyperbilirubinemia.
  - If conjugated fraction of the TSB exceeds 50% of the TSB, consultation with a paediatric gastroenterologist or neonatologist is warranted.
- Phototherapy (PT) is the first line treatment.
- All modes of PT are safe and effective in preterm neonates.
- Ensure as much surface area of the neonate is exposed to PT

3.2.3 Contraindications for phototherapy

- Neonates with congenital porphyria.
- Family history of porphyria.
- Concurrent treatment with photosensitising drugs.
- Conjugated hyperbilirubinemia.

3.2.4 Starting phototherapy

- Use PT threshold graphs to decide on PT (Refer to Appendix 2-10).
- Look for any risk factors such as:
  - Prematurity
  - Iso-immune haemolytic disease
  - G6PD deficiency
  - Polycythaemia
  - Asphyxia
  - Bruising or haemorrhages
  - Temperature instability
  - Sepsis or
  - Acidosis as this increases the risk of bilirubin neurotoxicity
- Consider PT at TSB levels 20 µmol/L below thresholds shown on the graphs in neonates with risk factors.
- Use single light PT when:
  - SBR is at or above treatment threshold.
  - SBR is not rising rapidly.
  - SBR is more than 50 µmol/L below the exchange transfusion threshold
- Use multiple light PT when:
  - SBR is rapidly rising (>8.5 µmol/L per hour)
  - SBR is within 50 µmol/L from the exchange transfusion threshold.
  - SBR fails to respond to single light phototherapy (static or continues to rise despite 6 hours of therapy).
  - Rapid reduction in SBR is required.
- Document the time of both commencement and cessation in the patient's medical record and integrated notes.

3.2.5 Types of phototherapy machines available

- GE Bilisoft (Picture 1)- a fibreoptic blue Light emitting diode (LED) PT system.
- Dräger Bililux (Picture 2)- A compact and lightweight LED PT
  - Irradiance can be dimmed in 5 steps to provide individualised patient therapy
- Dräger Photo-Therapy 4000 lamps (Picture 3)- a conventional overhead PT device.
  - Blue tubes provide the therapeutic light and the white tubes provide light to make it easier for the nurses to work with the lamp by balancing the intense blue colour.
  - The white lights do not produce therapeutic light.

Picture 1

Picture 2

Picture 3

3.2.6 Care during phototherapy

- Skin to skin:
  - Continuous, rather than intermittent PT is recommended. Short breaks of up to 30 minutes for kangaroo care can be considered at the medical officer's discretion.
  - If neonate is on a bili- soft blanket, encourage PT to remain in place during skin to skin to ensure continuous PT delivery
  - Remove eye protection during kangaroo care (if not actively receiving PT)
- Assessments:
  - Document input/output - loose stools are common (dark urine and or light stools may indicate obstructive causes of jaundice)
  - Bare weigh, as necessary
  - Daily assessment of neonatal wellbeing should include assessment of skin integrity
  - Observe and record assessments 6 hourly in clinical record
- Monitoring:
  - Continue cardiorespiratory monitoring as per unit policy
- Temperature:
  - Continue temperature monitoring as per unit policy
- SBR Measurement:
  - If SBR prior to starting PT is within 50 µmol/L of exchange transfusion threshold, repeat SBR 4-6 hours after initiating phototherapy PT (the total SBR should decrease by 34 µmol/L in this time period for both term and preterm neonates).
  - Subsequent SBRs 6-24 hourly interval depending on the severity and rate of rise of SBR.
  - If SBR is rapidly rising (> 8.5 µmol/L/hour) or continuing to rise under single light PT consider changing to multiple light sources and repeat SBR in 4-6 hours
  - Repeat SBR 12-24 hours after PT ceases to assess for rebound in the bilirubin level.
- Feeding:
  - Encourage feeding the neonate as appropriate
  - Intravenous (IV) fluids or additional nasogastric enteral feeds may be needed in neonates who are needing multiple light PT and
    1. The SBR is rising rapidly (>8.5 µmol/L/hour)
    2. The SBR level is within 50 µmol/L below the threshold for exchange transfusion
- Position:
  - Neonates can be nursed in any position as per unit developmental care policy

- Skin care:
  - Do not use lotions or lubricants
  - Monitor for skin breakdown from increased faecal loss
  - Eye care with eye protective mask/patch
  - Ensure PT is applied to the maximum area of skin
  - Position PT device according to manufacturer's instructions
  - Remove clothing but leave the nappy on for PT

Note
Do NOT turn the humidicrib off during PT.
Plastic heat shields are no longer recommended for use.
If using Draeger 4000 lamp, it may be necessary to decrease humidicrib temperature to prevent overheating.

3.2.7 Escalation of care

- Escalation of care threshold is within 50 µmol of the exchange transfusion threshold and this refers to when a baby may receive increased measures that can be taken to prevent the need for exchange transfusion and possibly prevent kernicterus.
- Measures that may be taken include:
  - Collect blood for Total and Conjugated bilirubin component, FBC, albumin, electrolytes, urea and creatinine (EUC), crossmatch and DAT
  - Intensive phototherapy/Multi light PT (ensure continuous non interrupted PT)
  - Enteral + IV hydration
  - Monitoring of TSB 2 hourly till below escalation threshold
  - Intravenous Immunoglobulin (IVIG) if indicated

3.2.8 Intravenous Immunoglobulin (IVIG)

- IVIG acts by blocking antibody site and preventing the destruction of sensitised erythrocytes.
- IVIG contains pooled IgG extracted from the plasma of over 1000 blood donors.
- Use IVIG as an adjunct to PT in cases of Rhesus or ABO haemolytic disease (with positive DAT) when SBR continues to rise rapidly (>8.5 µmol/L/hour) or exceeds escalation of care threshold. Refer to IVIG ANMF for dose and administration requirements. The dose can be repeated in 12 hours if required.
- IVIG should only be given with the consent of the neonatologist on-call.
- IVIG is a blood product, so written consent should be obtained from parents (Appendix 11).

3.2.9 Exchange transfusion

- Use a single or double volume exchange transfusion to treat neonates:
  - Whose SBR indicates its necessity according to treatment threshold graphs and/or
  - With clinical features and signs of acute bilirubin encephalopathy
  - In neonates who have not been on PT at the time of SBR measurement:

- Commence multiple light PT with IV hydration while preparing for exchange transfusion
- If SBR falls below exchange transfusion threshold, do not commence exchange transfusion but continue PT and monitor TSB every 2 hours till below the escalation of care threshold

- During Exchange transfusion:
  - Do not stop PT if possible
  - Do not use albumin priming
  - Do not routinely administer IV calcium following exchange transfusion
  - Continue PT post exchange transfusion, measure SBR within 2 hours and manage according to threshold graphs

3.2.10 Ceasing phototherapy

- Consider stopping PT once SBR has fallen to 50 µmol below the PT threshold and clinically stable.
- Measure SBR 12-24 hours after ceasing PT to rule out significant rebound.
  - Rebound jaundice is defined as TSB concentrations that reaches treatment threshold for age within 72-96 hours post cessation of phototherapy
  - Phototherapy within 48 hours of life, haemolytic disease, prematurity, and higher TSB at the time of PT discontinuation in relation to PT threshold increase the risk of having significant rebound jaundice.

3.3 Documentation

- eRIC
- Neonatal Jaundice Threshold Graphs
- eMR
- Blood and Blood Product Administration Form

3.4 Education Notes

- Approximately 60% of term and 80% of preterm neonates develop jaundice in the first week of life, and about 10% of breastfed babies are still jaundiced at 1 month of age.
- In most neonates including preterm, jaundice is attributed to neonatal physiology with no underlying disease.
- Neurotoxicity of bilirubin:
  - When the level of serum unconjugated bilirubin exceeds the binding capacity of albumin, the excess unbound bilirubin crosses the blood-brain barrier, resulting in neuronal injury.
  - Prematurity, low birthweight, and clinical complications, such as sepsis, acidosis and asphyxia have an increased risk of bilirubin neurotoxicity.
  - The exact level of bilirubin to induce neurotoxicity is contested. Preterm neonates have been observed to develop kernicterus at relatively lower TSB levels 170-206µmol/L (10-18mg/dL)[20].

- The goal of management is to lower the concentration of circulating bilirubin.
- Phototherapy is the recommended first line treatment. It employs blue wavelengths of light which are absorbed by dermal and subcutaneous bilirubin, inducing a fraction of the pigment to undergo photochemical reactions. These reactions alter the structure of bilirubin to make it less lipophilic and can be excreted in bile or urine without the need for conjugation[12].
- Bilirubin Encephalopathy or Kernicterus
  - Clinically, kernicterus presents as follows:
    - Stage 1: Poor Moro Reflex, decreased tone, lethargy, poor feeding, vomiting, high-pitched cry.
    - Stage 2: Opisthotonus, seizures, fever, rigidity, oculogyric crises, paralysis of upward gaze.
    - Stage 3: Spasticity is decreased at about 1 week of age.
    - Stage 4: Late sequelae include spasticity, athetosis, deafness, mild cognitive disability, paralysis of upward gaze and dental dysplasia.
- Other therapies
  - Albumin - The use of albumin is not currently recommended and there is insufficient evidence to support its routine use as an adjunct therapy prior to exchange transfusion.
  - Do not use any of the following to treat hyperbilirubinemia:
    - Agar
    - Barbiturates
    - Charcoal
    - Cholestyramine
    - Clofibrate
    - D-penicillamine
    - Metalloporphyrin
- Types of PT:
  - Fibre optic PT - comprises a light generator, a fibre optic cable carrying light to a flexible light pad or blanket placed under or around the neonate.
  - LED PT - emits high intensity light in a narrow wavelength spectrum and produces minimal heat.
  - Conventional or Single light PT - a single fluorescent blue light unit positioned above the neonate (irradiance of 15 μW/nm/cm² to 30 μW/nm/cm2) - one unit of PT light; either fluorescent, LED or fibre optic phototherapy.
  - Intensive or Multiple light PT (irradiance of > 30 μW/nm/cm2) - more than one light source used simultaneously.
- The response to PT depends on several factors including clinical circumstance, gestational and post-natal age, birthweight, cause of jaundice, initial bilirubin level, light dosage, and spectral emission. A decrease of 6-20% of the initial bilirubin level can be expected in the first 24 hours of standard phototherapy. Other studies have also observed higher reductions of 32-50% by varying spectral irradiance and configuration of standard phototherapy units[11]. However, a reduction in TSB levels alone is not adequate to substantiate a clear relationship between phototherapy and kernicterus as it is not simply a function of TSB but involves an interaction with the blood-brain barrier[18].

- RCT comparing PT against a control group found no statistically significant differences in neurodevelopmental outcomes at 1 and 6 years of age[16]. Similarly, Morris[13] conducted a comparison of aggressive vs conservative PT in ELBW neonates and found no significant difference in the rate of death or neurodevelopmental impairments. However, aggressive PT reduced the rate of neurodevelopmental impairment and significantly reduced the mean peak TSB level. This reduction was offset by a 5% increase in risk of death (34% vs 29%) with aggressive PT in neonates weighing 501-750 grams. While it was not statistically significant, a post-hoc analysis estimated a 93-99% probability that mortality was increased in this subgroup. The mechanism is unclear, but evidence suggest an oxidative injury as these neonates have gelatinous, thin skin which readily transmits light. The antioxidant properties of bilirubin are also reduced in aggressive PT[4,13]
- Recommendations on PT thresholds vary across the regions and is considered more of a consensus view than thoroughly evidence based.
- UK NICE Guidelines for PT for preterm neonates were based on a longstanding and common approach simple formula for bilirubin in µmol/L = (gestational age × 10) − 100 UK NICE Guidelines used this formula for babies aged 72 hours or older. The threshold levels during the first 72 hours were determined by drawing a straight line from a level of 40 µmol/L (the upper limit of normal for the umbilical cord blood bilirubin) at 0 hour of age to the formula-based level at 72 hours. From 72 hours of age, the line is horizontal[15]
- American Academy of Paediatrics (AAP) Guidelines: The AAP guideline provides age and gestation specific bilirubin treatment thresholds for those with and without bilirubin neurotoxicity risk factors[2].
- Norwegian Guidelines: The Norwegian Guidelines use birth weight as a measure of prematurity instead of gestational age. There is no treatment indication defined during the first 24 hours as health newborns without haemolytic jaundice rarely present with visible jaundice at this time[26].
- Short-Term Side Effects of PT:
  - Neonate-Parent Interaction: Phototherapy separates neonates from mothers, which may interfere with establishing parent-child bonding[23].
  - Dehydration: There is an acute change in the thermal environment of neonates, leading to insensible water loss, hypothermia/hyperthermia, and dehydration.
    - Impaired water and electrolyte absorption induces phototherapy-associated diarrhoea, increasing intestinal fluid losses.
    - Close monitoring and fluid supplementation is recommended for newborns, especially low birth weight neonates.
  - Hypocalcaemia: Phototherapy can also lead to hypocalcaemia due to increased urinary calcium excretion and disruption of calcium homeostasis by light inhibiting pineal secretion of melatonin. Covering the head by applying a hat reduces the incidence of hypocalcaemia, especially in preterm neonates[24]
  - Patent Ductus Arteriosus: It is hypothesised that light penetrating the chest wall of preterm neonates can cause the relaxation of aortic smooth muscle, thus preventing the closure of or reopening ductus arteriosus. A study on ELBW neonates undergoing phototherapy had a significantly increased incidence of PDA compared to those not undergoing phototherapy [76% vs 53%]. It was also

reported that more than 50% of small preterm infants had reopening of a closed ductus arteriosus after phototherapy[24].

- Retinal Damage: As photon absorption is increased during blue light exposure, the retina is more susceptible to light-induced apoptosis. To prevent this, the neonate's eyes should be protected by eye pads or head shields. There is some evidence suggesting an association between phototherapy and retinopathy of prematurity (ROP). A retrospective study found that infants with ROP had a significantly longer duration of phototherapy than those without[23].
- Oxidative Stress: Bilirubin is an endogenous antioxidant. At moderate levels, it scavenges reactive oxygen species, reduces oxidant-induced cellular injury and attenuate oxidation stress. In term neonates, total bilirubin up to 20 mg/dL has a positive correlation with total antioxidant capacity and negative correlation with malondialdehyde, an important marker of lipid peroxidation. It has been suggested that PT induces the release of reactive nitrogen and oxygen species, and photolysis products that are cytotoxic. In term and late-preterm infants, phototherapy leads to lower Total Antioxidant Capacity levels and increase oxidative stress index (OSI). While this has the propensity to cause DNA damage, there have not been any widespread consequences. As a precaution, gonadal shielding is recommended[24].
- Bronze Baby Syndrome (BBS): BBS is characterised by brown discolouration of skin, serum, and urine. It is a rare complication in neonates with raised conjugated bilirubin level. While BBS subsides after discontinuation of phototherapy, it may be an additional risk for developing kernicterus[24].
- Neonates with cholestatic jaundice have developed rare purpuric and bullous eruptions, possibly attributable to sensitisation by accumulating porphyrins[12].

- Long-Term Side Effects of PT
  - Allergic Diseases: A recent systematic review showed a significant increase in the odds of asthma [OR 4.26] and allergic rhinitis [OR 5.37] after neonatal phototherapy. The exact mechanism is unknown but could involve abnormalities in Th-2/Th-1, cytokine levels, impaired bilirubin antioxidant defence and increased eosinophilic cationic protein levels after PT[24].
  - Cancer: Wickremasinghe et al found that phototherapy was associated with an increased risk of cancer in the first year after birth, although the absolute risk increase is small[21]. Newman et al also explored an association between phototherapy and childhood cancer and found that PT was no longer significant when adjusted for potential confounders. In vivo experiments on neonates have demonstrated DNA damage, alterations in cytokine levels and evidence of oxidative stress after treatment with phototherapy. These conditions are implicated in the pathogenesis of cancer, providing a potential mechanism for causality[21].

3.5 Abbreviations

SCH	Sydney Children's Hospital	FBC	Full blood count
SBR	Serum Bilirubin	DAT	Direct Anti-globulin Test

G6PD	Glucose-6-phosphate Dehydrogenase	TSB	Total Serum Bilirubin
PT	Phototherapy	LED	Light Emitting Diode
IV	Intravenous	EUC	Electrolytes, Urea, Creatinine
IVIG	Intravenous Immunoglobulin	AAP	American Academy of Paediatrics

3.6 Related Policies/procedures

- NSW Health GL2016-027: Neonatal – Jaundice Identification and Management in Neonates ≥32 weeks gestation.
- RHW NCC CBR- Blood product transfusion - Neonate
- RHW NCC CBR- Exchange Transfusion
- RHW NCC CBR- Heel prick for blood sampling
- RHW NCC CBR- Transcutaneous Bilirubin (TcB) measurement
- IVIG ANMF

3.7 References

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4 ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for an Aboriginal and/or Torres Strait Islander woman or family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.

5 CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours.
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

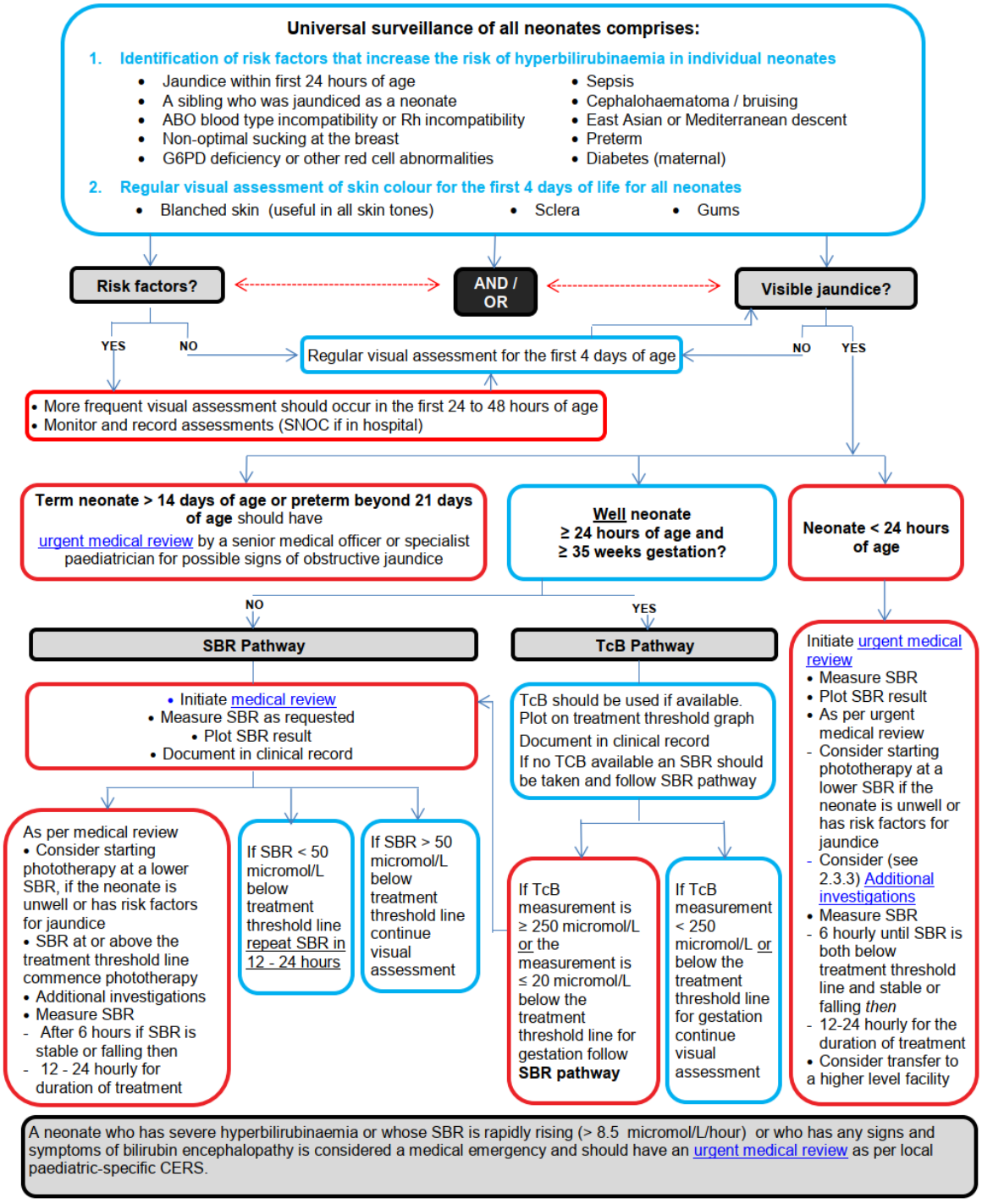
6 NATIONAL STANDARDS

- Standard 1- Clinical Governance
- Standard 2- Partnering with consumers
- Standard 4- Medication Safety
- Standard 5- Comprehensive Care
- Standard 6- Communicating for safety
- Standard 7- Blood Management
- Standard 8- Recognising and Responding to Acute Deterioration

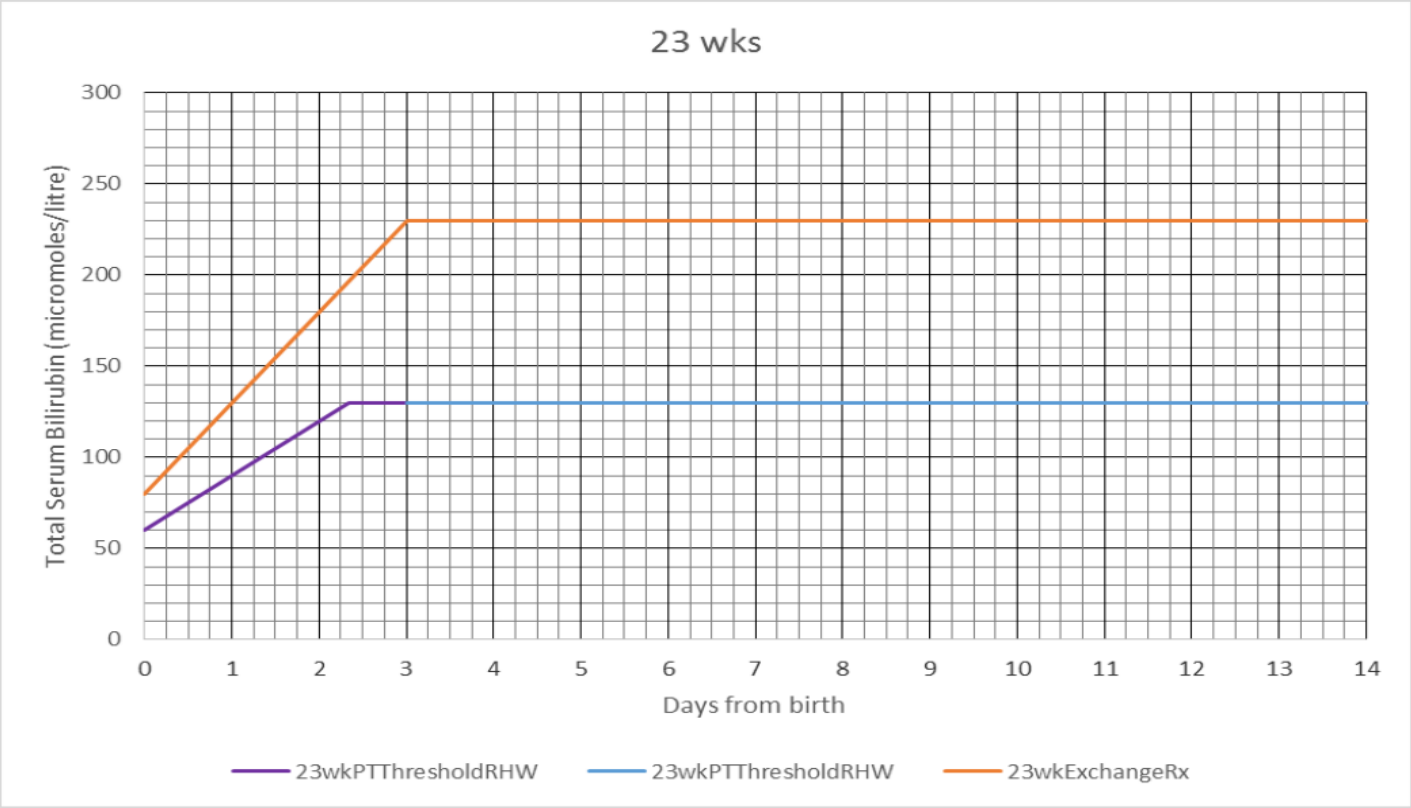
7 REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
18.11.2010	1	S Bolisetty (Neonatologist)
28.2.2017	2	S Bolisetty (Neonatologist), K Nanthakumar
4.3.2025 3.4.2025	3	D Nair Sudhaharan (Fellow), S Bolisetty (Medical Co- Director) Endorsed by NCC CBR Committee
14.4.25	3	RHW BRGC

Appendix 1 Identification and investigation of Neonatal Jaundice (NSW health guidelines GL2016_027)

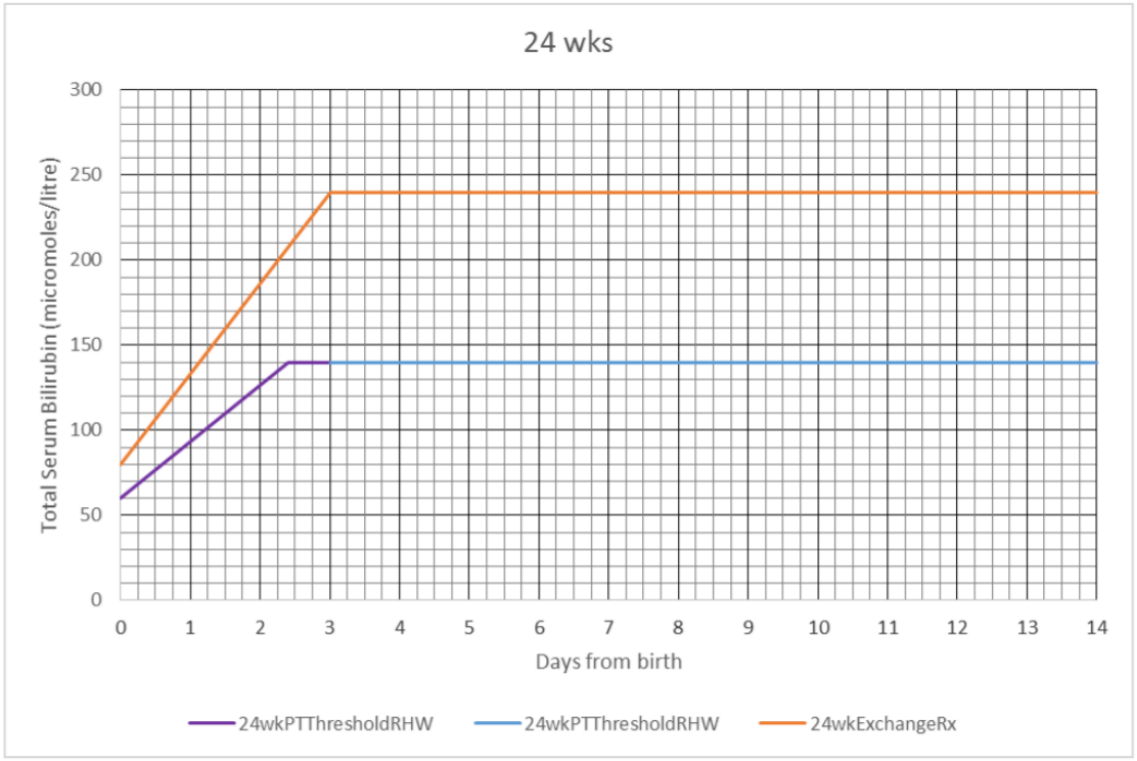


Appendix 2 RHW Neonatal Jaundice Treatment Threshold Graphs 23 weeks



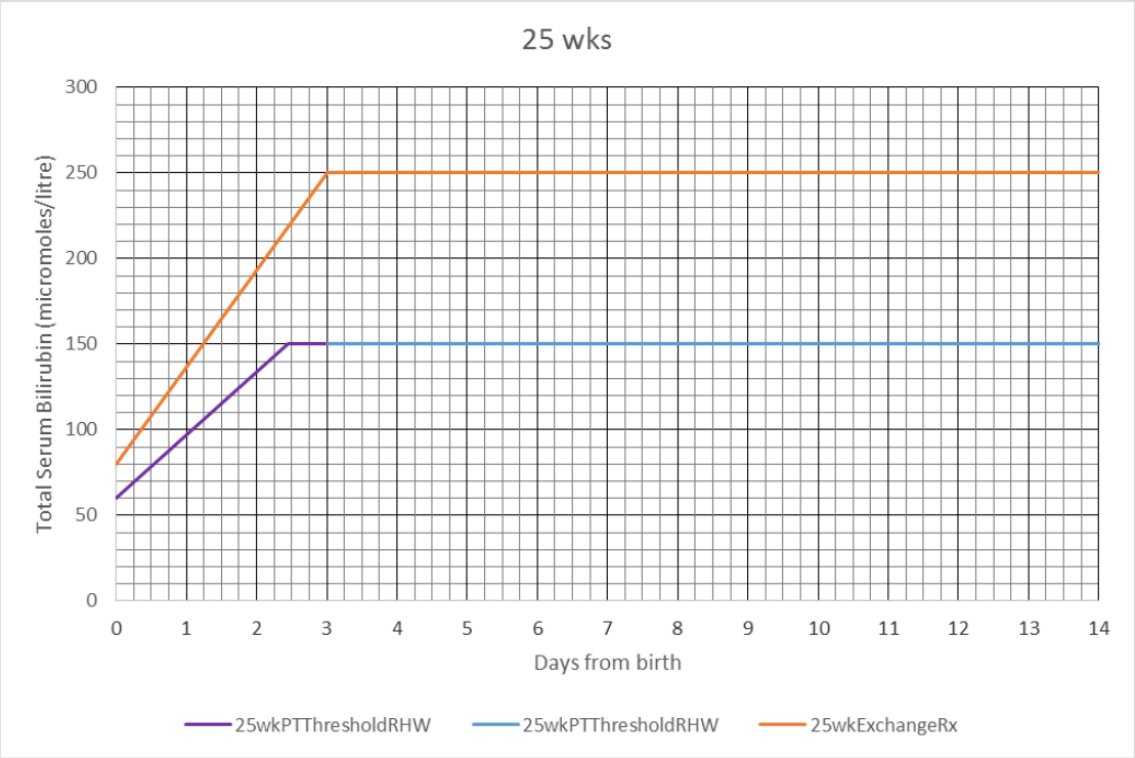
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 2. Jaundice Threshold Graphs at 24 weeks gestation at birth

Appendix 3 RHW Neonatal Jaundice Treatment Threshold Graphs 24 weeks



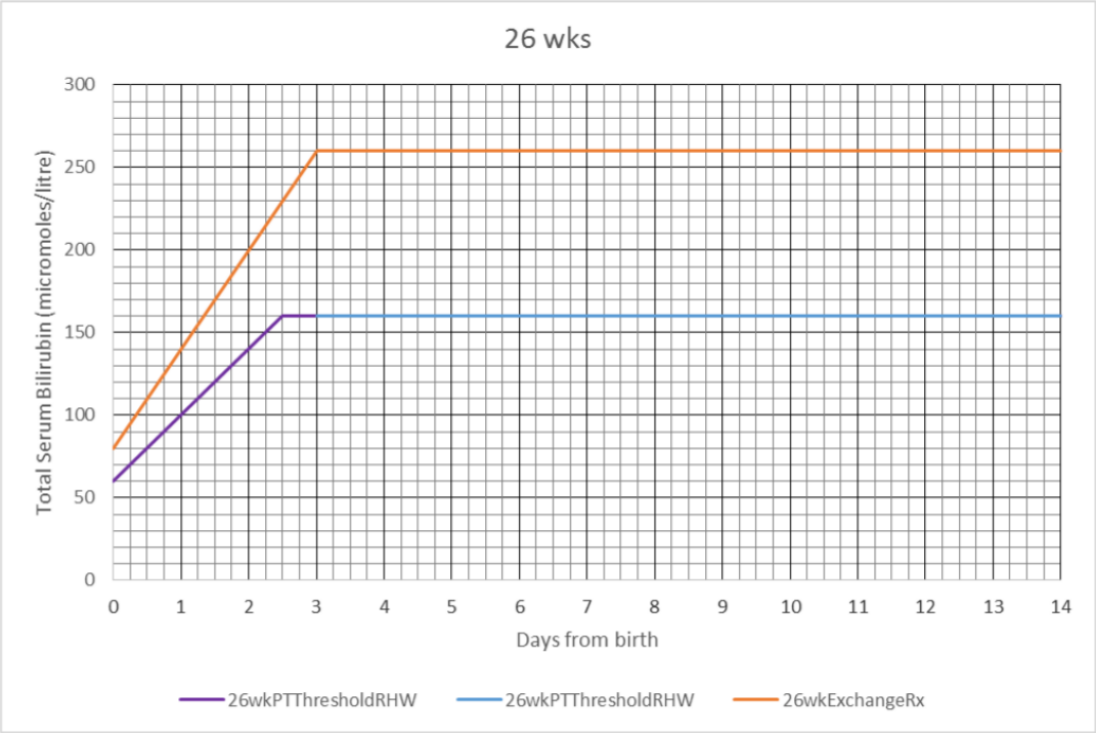
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.

Appendix 4 RHW Neonatal Jaundice Treatment Threshold Graphs 25 weeks



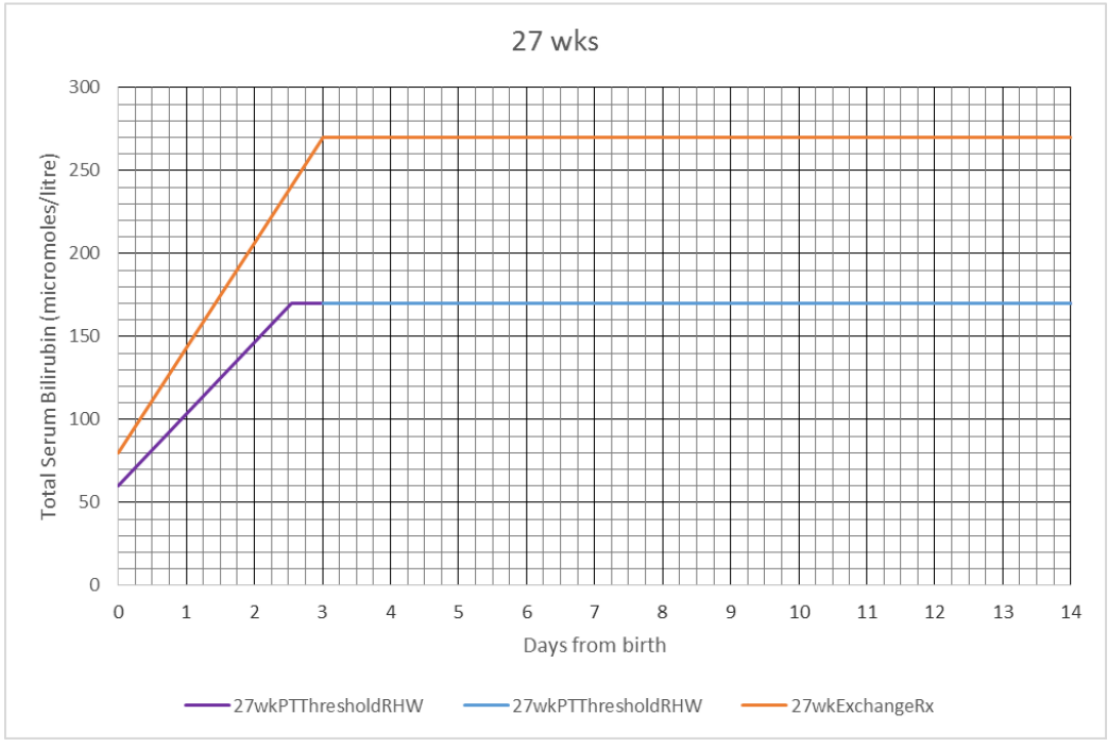
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 4. Jaundice Threshold Graphs at 26 weeks gestation at birth

Appendix 5 RHW Neonatal Jaundice Treatment Threshold Graphs 26 weeks



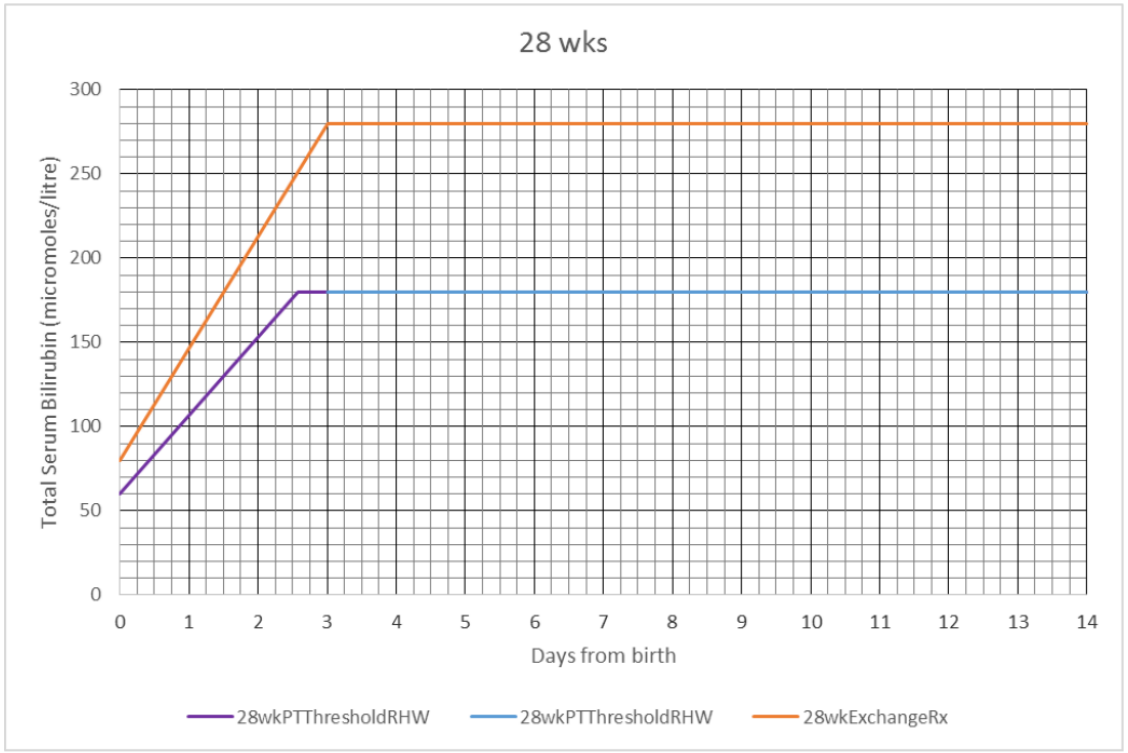
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 5. Jaundice Threshold Graphs at 27 weeks gestation at birth

Appendix 6 RHW Neonatal Jaundice Treatment Threshold Graphs 27 weeks



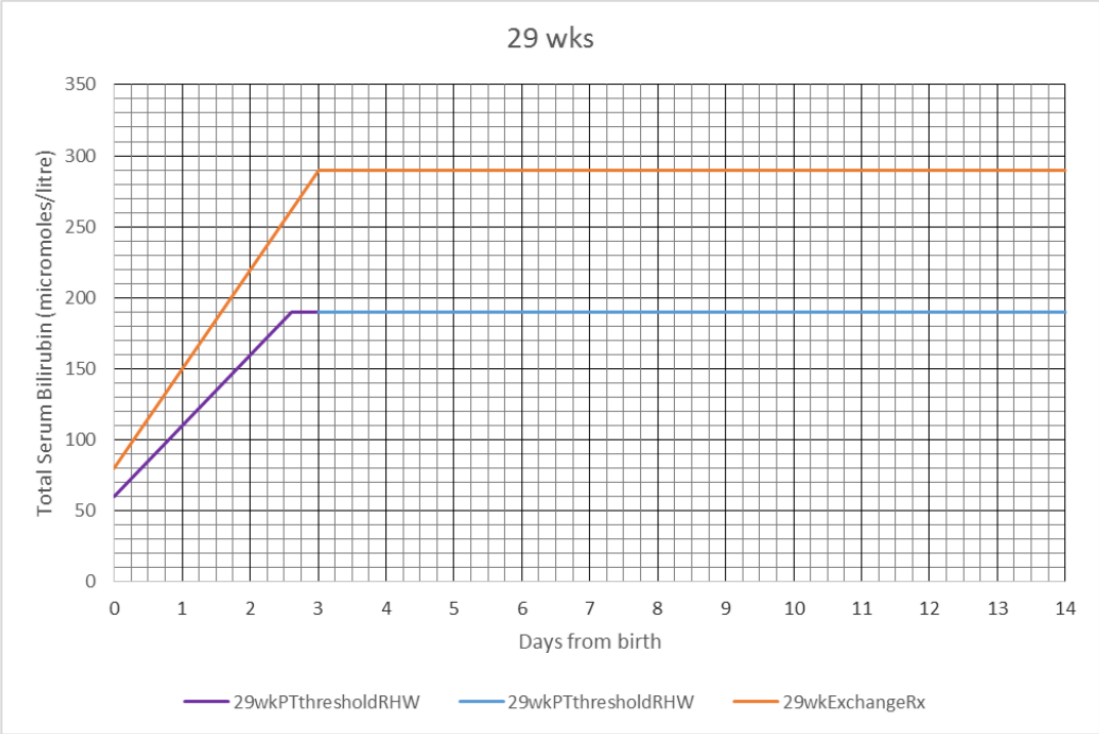
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 6. Jaundice Threshold Graphs at 28 weeks gestation at birth

Appendix 7 RHW Neonatal Jaundice Treatment Threshold Graphs 28 weeks



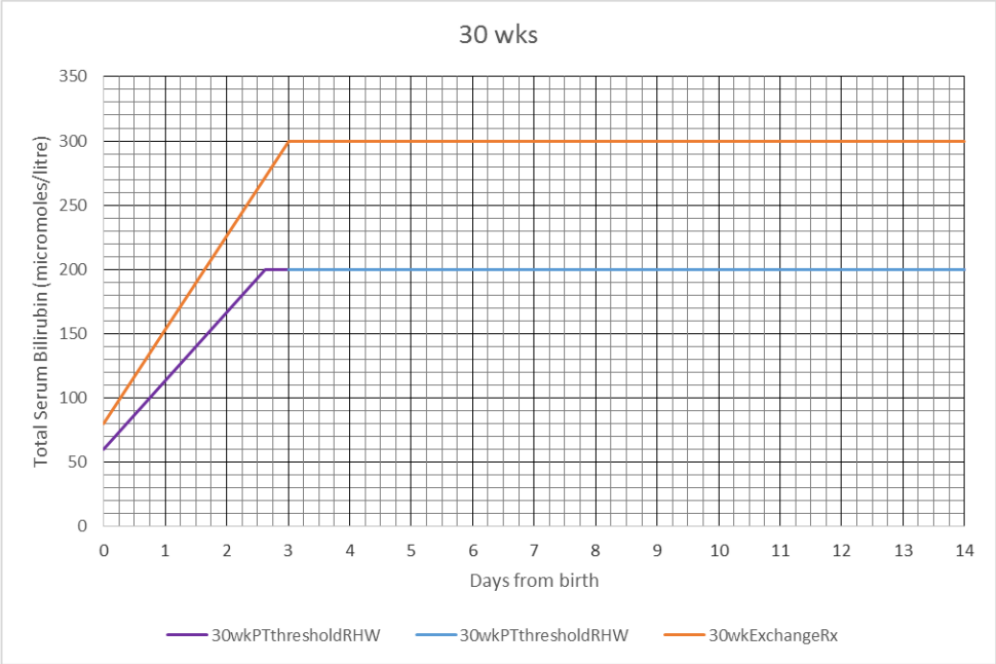
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 7. Jaundice Threshold Graphs at 29 weeks gestation at birth

Appendix 8 RHW Neonatal Jaundice Treatment Threshold Graphs 29 weeks



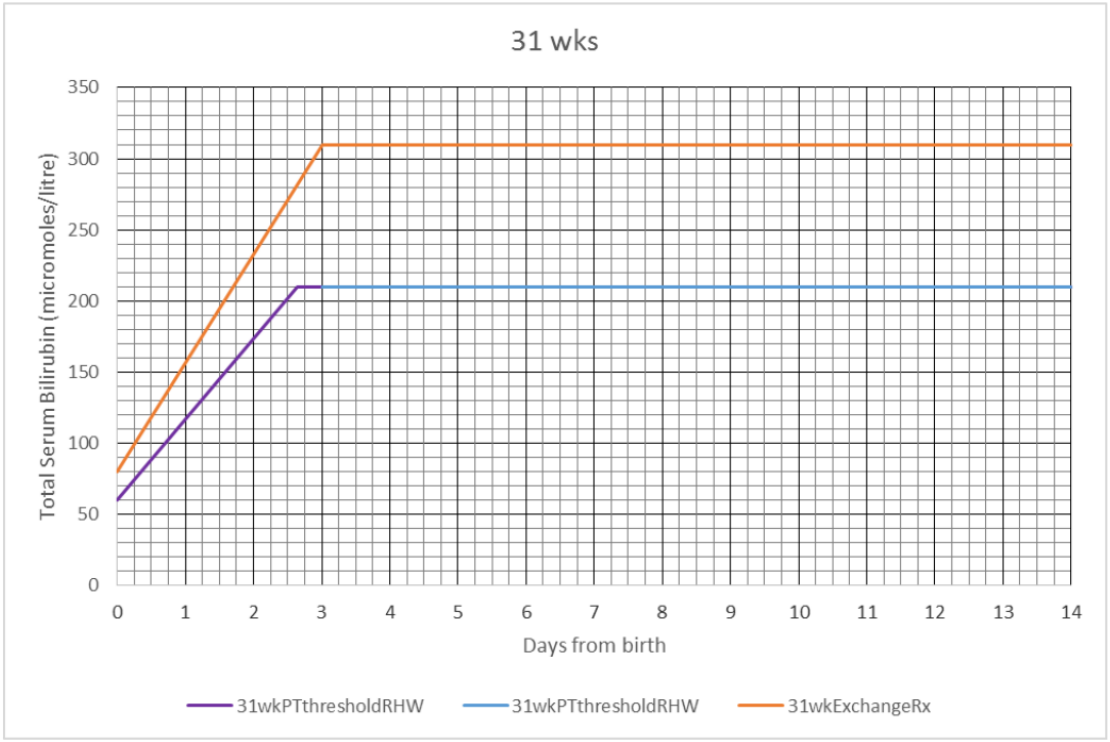
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 8. Jaundice Threshold Graphs at 30 weeks gestation at birth

Appendix 9 RHW Neonatal Jaundice Treatment Threshold Graphs 30 weeks



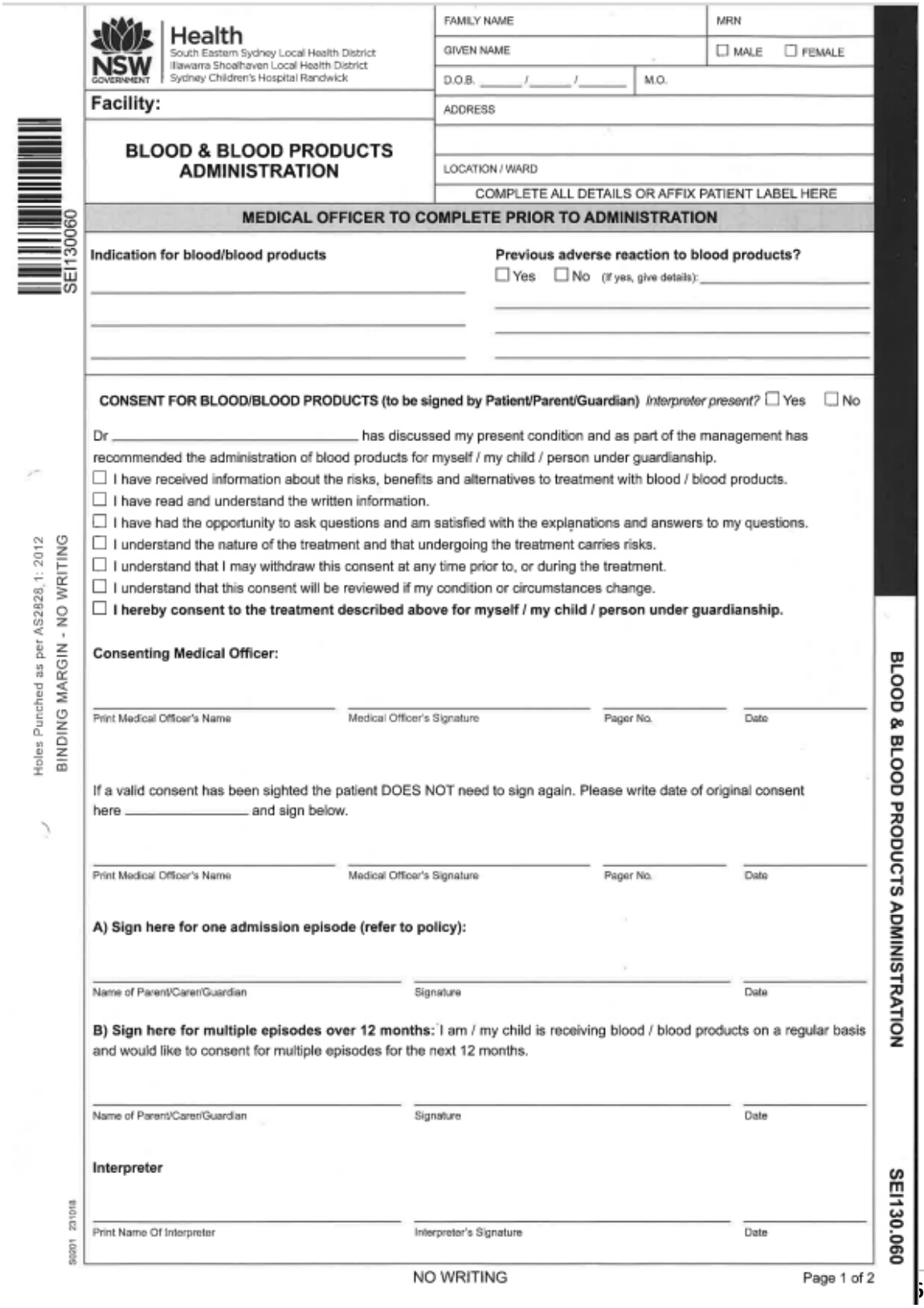
*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.
Appendix 9. Jaundice Threshold Graphs at 31 weeks gestation at birth

Appendix 10 RHW Neonatal Jaundice Treatment Threshold Graphs 31 weeks



*It is an option to start PT at SBR 20-40 µmol/L below the thresholds in the presence of risk factors including isoimmune haemolytic disease, G6PD deficiency, IUGR, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, bruising or haemorrhages.

Appendix 11 Blood and Blood Products Administration Form



Health
South Eastern Sydney Local Health District
Illawarra Shoalhaven Local Health District
Sydney Children's Hospital Randwick

Facility:

BLOOD & BLOOD PRODUCTS ADMINISTRATION

SEI130060

FAMILY NAME | MRN
GIVEN NAME | ☐ MALE ☐ FEMALE
D.O.B. ____/____/____ | M.O.
ADDRESS
LOCATION / WARD
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE

MEDICAL OFFICER TO COMPLETE PRIOR TO ADMINISTRATION

Indication for blood/blood products

Previous adverse reaction to blood products?
☐ Yes ☐ No (If yes, give details): _____

CONSENT FOR BLOOD/BLOOD PRODUCTS (to be signed by Patient/Parent/Guardian) *Interpreter present?* ☐ Yes ☐ No

Dr _____ has discussed my present condition and as part of the management has recommended the administration of blood products for myself / my child / person under guardianship.

- ☐ I have received information about the risks, benefits and alternatives to treatment with blood / blood products.
- ☐ I have read and understand the written information.
- ☐ I have had the opportunity to ask questions and am satisfied with the explanations and answers to my questions.
- ☐ I understand the nature of the treatment and that undergoing the treatment carries risks.
- ☐ I understand that I may withdraw this consent at any time prior to, or during the treatment.
- ☐ I understand that this consent will be reviewed if my condition or circumstances change.
- ☐ **I hereby consent to the treatment described above for myself / my child / person under guardianship.**

Consenting Medical Officer:

Print Medical Officer's Name | Medical Officer's Signature | Pager No. | Date

If a valid consent has been sighted the patient DOES NOT need to sign again. Please write date of original consent here _____ and sign below.

Print Medical Officer's Name | Medical Officer's Signature | Pager No. | Date

A) Sign here for one admission episode (refer to policy):

Name of Parent/Carer/Guardian | Signature | Date

B) Sign here for multiple episodes over 12 months: I am / my child is receiving blood / blood products on a regular basis and would like to consent for multiple episodes for the next 12 months.

Name of Parent/Carer/Guardian | Signature | Date

Interpreter

Print Name Of Interpreter | Interpreter's Signature | Date

NO WRITING

Page 1 of 2

BLOOD & BLOOD PRODUCTS ADMINISTRATION SEI130.060

Holes Punched as per AS2828.1: 2012
BINDING MARGIN - NO WRITING

SO201 23/10/18