TITLE
HYPERBILIRUBINEMIA SCREENING, ASSESSMENT AND TREATMENT (WELL NEWBORN GREATER THAN 35 WEEKS GESTATION)

SCOPE
Provincial: Postpartum, Well Newborn Units, and Emergency Departments

APPROVAL AUTHORITY
Vice President, System Innovations & Programs

SPONSOR
Maternal, Newborn, Child & Youth Strategic Clinical Network

NOTE: The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

If you have any questions or comments regarding the information in this document, please contact the Policy & Forms Department at policy@ahs.ca. The Policy & Forms website is the official source of current approved policies, procedures, directives, standards, protocols and guidelines.

OBJECTIVES
• To reduce the incidence of severe hyperbilirubinemia and related consequences in otherwise healthy term and late preterm newborns by:
  o identifying newborns at risk for hyperbilirubinemia;
  o identifying neonatal hyperbilirubinemia in a timely and accurate manner;
  o providing timely interventions and/or treatment(s) as required; and
  o ensuring appropriate follow-up in the community after hospital discharge.

PRINCIPLES
• Prevention of bilirubin encephalopathy in the newborn requires clinical assessment and management of hyperbilirubinemia.

• Universal screening for newborn hyperbilirubinemia using either total serum bilirubin (TSB) or transcutaneous bilirubinometry (TcB) should occur prior to the period of highest risk, which is 72 hours following birth. Screening helps to determine the risk for newborn hyperbilirubinemia and facilitates anticipatory and effective management.

• The late preterm infant is more susceptible to hyperbilirubinemia.
• Use of TcB screening is highly effective. TcB is objective, non-invasive, and reduces the likelihood that a clinically significant TSB level will be missed, while significantly reducing the number of serum bilirubin measurements required. TcB results are available immediately, so there is no delay in measurement of the bilirubin level.

APPLICABILITY

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, Students, Volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

ELEMENTS

1. Points of Emphasis

1.1 Implementation of this guideline shall be in accordance with the AHS Consent to Treatment/Procedure(s) Policy Suite.

1.2 The intended application of this guideline is for the assessment and management of early acute jaundice in newborns between 12 hours and approximately 10 days of life. This guideline is not applicable to situations of prolonged or pathological jaundice and is not intended for use in the Neonatal Intensive Care Unit (NICU) setting.

1.3 A TSB screening shall be performed immediately on any newborn in the first 24 hours of life that appears to be jaundiced.

1.4 A TcB or TSB screening should be performed on all newborns in the first 24 hours of life, in accordance with a structured jaundice management plan.

1.5 Newborns’ guardians and families should be encouraged to be active partners with the healthcare team in order to improve outcomes with neonatal hyperbilirubinemia.

1.6 Effective phototherapy should be recommended as part of a treatment plan:

a) to prevent severe hyperbilirubinemia in newborns with elevated TSB concentrations; and

b) as initial therapy in newborns with severe hyperbilirubinemia.

1.7 Breastfeeding support should be provided to all breastfeeding mothers and their newborns to minimize the risk of hyperbilirubinemia.
2. Identification of Hyperbilirubinemia

2.1 The Registered Nurse (RN) or Licensed Practical Nurse (LPN) with the training to recognize hyperbilirubinemia shall clinically assess the newborn for jaundice in the first 24 hours of life and then every 24 hours until hospital discharge. Assessment should be completed as needed and may include but is not limited to:

   a) visual examination of the sclera, mucous membranes, and blanching of skin (to occur in a well-lit area);
   b) assessment of cuing and effective feeding, hydration status, and adequacy of output and stooling;
   c) daily weight assessment if there are feeding concerns; and
   d) level of alertness, lethargy, and excessive or high-pitched crying.

2.2 TcB or TSB levels shall be measured in every newborn between 12-24 hours of life and as close to discharge from hospital as possible if discharged prior to 24 hours of life.

2.3 Newborns who remain in hospital for longer than 24 hours should have repeat TcB screening performed every 24 hours, and within 12 hours of discharge.

2.4 All newborns shall be assessed by the health care professional for risk factors of hyperbilirubinemia which should be considered in conjunction with the clinical assessment and TcB/TSB results. Newborns at risk for hyperbilirubinemia include newborns with the following characteristics:

   a) gestational age is less than 38 weeks;
   b) exclusive or partial breastfeeding (higher concern if suboptimal intake at feedings, as evidenced by ineffective milk transfer and signs of dehydration);
   c) isoimmune or haemolytic disease;
   d) previous sibling with jaundice requiring phototherapy as a newborn;
   e) visible jaundice in the first 24 hours of life;
   f) cephalohematoma/severe bruising or sustained trauma;
   g) East Asian ethnicity;
   h) male gender; and/or
   i) maternal age greater than 25 years.
The process for screening the newborn with a gestational age of greater than 35 weeks for the risk of the development of hyperbilirubinemia is outlined in Appendix A: Acute Care Screening and Management for Hyperbilirubinemia.

3. TcB Measurement

3.1 If available, a newborn’s bilirubin level should be measured with a transcutaneous bilirubin meter (TcB meter).

3.2 TcB measurement should only be performed using a meter that has been correctly validated according to Point of Care program standards on:
   a) newborns equal to or less than 10 days of life;
   b) newborns who have not received phototherapy; and
   c) newborns who have not received an exchange transfusion.

3.3 TcB measurements shall only be performed by health care professionals who have successfully completed the AHS Point of Care Testing Jaundice Meter education resource for the TcB meter used in their practice setting.

3.4 The health care professional shall perform the TcB measurement using the method described by the AHS Point of Care Testing Jaundice Meter program.

3.5 TcB measurements shall only be taken with a TcB meter that meets AHS lab services point-of-care quality control requirements.

3.6 Either the forehead or the sternum may be used as the TcB measurement site providing that the location is consistently used and identified, and the measurements documented in the newborn’s health record.

3.7 To manage the TcB results, see Section 4 below for communities without an established community TcB screening program or Section 5 below for communities with an established community TcB screening program.

4. Management of TcB and TSB Results for Communities Without an Established Community TcB Screening Program (All Communities Outside of Calgary Zone - Urban)

4.1 TcB levels and/or TSB levels should be plotted by the RN or LPN on the Bhutani predictive nomogram as per Appendix B below.
   a) The zone in which the value falls will predict the risk of the newborn developing hyperbilirubinemia. Refer to Appendix C below.

4.2 If the TcB or TSB level plots on the Bhutani predictive nomogram in the low or low-intermediate risk zone (see Appendix B below), only routine care is required (e.g., continue TcB or TSB testing every 24 hours while in hospital).
4.3 If the TcB level plots on the Bhutani predictive nomogram in the high-intermediate or high risk zone (see Appendix B below), a TSB level should be drawn to determine if further investigation, initiation of phototherapy, or other management is required.

4.4 TSB levels that plot in the high-intermediate or high risk zone on the Bhutani predictive nomogram shall also be plotted by the RN or LPN on the *Indication for Phototherapy or Exchange Transfusion* graph as per Appendix D below, to determine appropriate management. Notify the most responsible health practitioner (MRHP).

   a) The MRHP shall consider the rate of rise, and trending. All treatment decisions should be based on a TSB level (refer to Section 6 below).

   b) The Bhutani predictive nomogram is associated with false negatives (i.e., may fail to predict significant hyperbilirubinemia) and therefore ongoing clinical vigilance is required in all newborns, particularly those feeding poorly or with other clinical risk factors.

4.5 The rate of rise, and trending of the TcB measurements should be considered when determining the next action.

4.6 If the TcB measurement is inconsistent with the clinical assessment outlined in Section 2.4 above, the RN or LPN shall use clinical judgment to determine if an assessment by the MRHP and an order for a TSB test is necessary.

5. **Management of TcB Results for Communities With an Established Community TcB Screening Program (Calgary Zone - Urban)**

5.1 TcB measurements should be plotted by the RN or LPN on the TcB nomogram for newborns who are:

   a) equal to or greater than 37 weeks gestation as per Appendix E below; or

   b) between 35-36 6/7 weeks gestation as per Appendix F below.

5.2 If a TcB measurement plots in the red zone, a TSB level should be drawn as per physician’s order to determine if further investigation, initiation of phototherapy, or closer follow-up is required. Plot the result as per Appendix D below and notify the MRHP.

5.3 A newborn with a TcB measurement that plots in the yellow zone should be reassessed clinically by the health care professional (including feeding and other risk factors) and a TcB test performed the following day.

5.4 If a TcB measurement plots in the green zone, only routine care is required (e.g., continue TcB testing every 24 hrs while in hospital).
5.5 The rate of rise, and trending of the TcB measurements should be considered when determining the next action.

5.6 If the TcB measurement is inconsistent with the health care professional’s clinical assessment, then the individual assessing the newborn shall collaborate with the MRHP regarding further assessment needs including an order for a TSB test as indicated.

6. Managing Hyperbilirubinemia

6.1 The RN or LPN shall plot TSB levels on the Indication for Phototherapy or Exchange Transfusion graph as per Appendix D below to determine the potential need for phototherapy treatment or the potential for exchange transfusion and referral to Neonatology or Pediatrics.

6.2 If neonatal sepsis is suspected, the MRHP shall consider consultation with Neonatology or Pediatrics.

6.3 The MRHP is responsible for ordering any additional diagnostic testing and treatment decisions including transfer to an appropriate level of care or other care provider if required.

a) Newborns with TSB plots in the high or high-intermediate risk zone on the Bhutani predictive nomogram or a TcB level that falls within the red zone of the TcB nomogram should have the following laboratory tests if clinically indicated:

   (i) complete blood count (CBC);

   (ii) reticulocyte count;

   (iii) albumin; and

   (iv) direct antiglobulin test (DAT). If the mother is Type O or has RBC antibodies, consider the strength of reaction and whether the mother received prophylactic anti-D immunoglobulin during pregnancy.

b) The following laboratory tests may also be clinically indicated:

   (i) blood glucose-6-phosphate dehydrogenase (G6PD) levels (dependent on ethnic origin or family history); or

   (ii) blood for culture and sensitivity, if infection is suspected.
7. **Phototherapy**

7.1 Phototherapy shall not be used for newborns whose TSB level does not exceed the phototherapy threshold level on the *Indication for Phototherapy or Exchange Transfusion* graph as per Appendix D below.

7.2 The health care team shall ensure all phototherapy equipment is maintained and used according to the manufacturers’ guidelines and that proper biomedical support is in place.

7.3 Blue light is recommended in the 430-490 nanometre (nm) spectrum as light penetrates skin well and is absorbed maximally by bilirubin at these wavelengths.

   a) Spectral irradiance of phototherapy equipment shall be measured by the health care team with an appropriate radiometer.

   b) Radiance measurements should be taken from multiple sites on the surface area with at least one (1) measurement of at least 30 µW/cm²/nm, and documented in the newborn’s health record.

   c) It is recommended that irradiance levels of phototherapy be measured and documented any time that phototherapy equipment is initiated or repositioned.

7.4 When there is indication for phototherapy and upon issuance of the physician order, irradiance should be delivered to as much of the newborn’s skin surface area as possible.

   a) Place the newborn in the supine position

   b) Avoid the use of creams or petroleum jelly on skin area.

   c) Newborns should only be wearing a diaper and eye cover.

7.5 The RN or LPN shall monitor and document the newborn’s vital signs, tone, level of alertness, and intake and output every four (4) hours while under phototherapy.

7.6 When supplemental feeds are indicated, expressed breast milk is the supplement of choice (if available and with the consent of the newborn’s guardian).

   a) In selected situations, specialty formula supplementation is appropriate and may enhance response to phototherapy.

   b) Phototherapy may be interrupted during feeding but interruptions in therapy should be kept to a minimum.
7.7 At the discretion of the MRHP and in consideration of the condition of the newborn and irradiance of the phototherapy equipment used, a follow-up TSB level is recommended six (6) hours following the initiation of phototherapy or four (4) hours following initiation of phototherapy if previous TSB levels demonstrated a pattern of a rapidly rising bilirubin level, or with a critical TSB level greater than 400 micromoles per litre (µmol/L).

7.8 The RN or LPN shall provide phototherapy information to the newborn’s guardian(s) including but not limited to:

   a) why phototherapy is being considered;
   b) possible adverse effects of phototherapy (interference with maternal-newborn interaction, temperature instability, intestinal hypermotility, diarrhea, and rarely, bronze discolouration of the skin);
   c) anticipated duration of treatment;
   d) importance of frequent feeding and need to wake newborn if necessary for feeds;
   e) the need for eye protection and routine eye care; and
   f) encouragement of interaction with the newborn but the need to keep breaks from phototherapy to a minimum.

8. Discontinuation of Phototherapy

8.1 The decision to discontinue phototherapy is at the discretion of the MRHP in consideration of the age of the newborn, when phototherapy was started, and the cause of the hyperbilirubinemia.

8.2 Not all newborns require TSB measurement post-phototherapy for rebound hyperbilirubinemia, nor require delayed discharge from hospital if the newborn is clinically stable otherwise.

8.3 The MRHP shall make arrangements with the guardian(s) to have a repeat ‘STAT’ TSB collected within 24 hours of discharge from hospital for the following newborns:

   a) all newborns who received phototherapy and are discharged at less than 72 hours of life; and
   b) all newborns who received phototherapy and are discharged at less than 96 hours of life with the following risk factors:
      (i) gestational age less than 37 weeks;
      (ii) DAT positive;
(iii) known G6PD deficiency;
(iv) weight loss greater than 10%;
(v) significant cephalhematoma or bruising; and/or
(vi) newborns with identified hemolysis.

8.4 The health care professional shall provide guardians of newborns who require a TSB test with an outpatient laboratory requisition and instructions to have the specimen drawn at a laboratory or hospital.

a) The requisition shall include the name of the primary health care provider who is responsible for the newborn’s follow-up in the community, where available.

9. Discharge and Follow-Up in the Community

9.1 Discharge planning for the newborn with risk factors should include follow-up with the newborn’s primary health care provider (e.g., Physician, Midwife, or Nurse Practitioner) within seven (7) days of discharge.

9.2 The term newborn who is discharged, with no other risk factors, identified on the Bhutani predictive nomogram as being within:

a) Low risk zone: routine care
b) Low-intermediate risk zone: If discharged before 72 hours follow-up within 48-72 hours.

9.3 The late preterm infant should not be discharged from hospital before 72 hours and follow-up in the community should continue for up to 10 days of life.

9.4 If clinically indicated and follow-up cannot be ensured when a TSB level plots in the high-intermediate or high risk zone of the Bhutani predictive nomogram, it may be necessary to delay hospital discharge until appropriate follow-up can be ensured or the period of risk has passed (e.g., greater than 72 hours of life).

9.5 In the absence of an established community TcB screening program, (exception Calgary zone), the predictive risk zone on the Bhutani predictive nomogram (see Appendix B below) should be documented by the RN or LPN in the newborn’s
health record. Appropriate follow-up arrangements should be made for newborns prior to hospital discharge. A copy of the Bhutani predictive nomogram should be provided to the guardian(s) with the predictive risk zone communicated.

9.6 In communities with an established community TcB screening program, a copy of the newborn TcB nomogram (see Appendix E or F) should be provided to the guardian(s) with the risk zone communicated, so that the guardian(s) are aware of and involved in the newborn’s plan of care.

9.7 Documentation on the Notice of Live Birth Form (Alberta) by the RN or LPN, shall include TSB and/or TcB results, bilirubin treatments received in hospital, DAT result (if measured), follow-up plans, feeding issues, and other pertinent information that may influence the follow-up, assessment, and management of jaundice in the newborn. In addition, a copy of the Bhutani predictive nomogram or the TcB nomogram shall be sent to Community Health.

9.8 A copy of the newborn TcB nomogram should be provided to the newborn’s guardian by the RN or LPN and sent to Community Health along with the Notice of Birth form (Alberta) so that the guardian has the newborn’s pertinent information and is involved in baby’s plan of care.

9.9 The primary health care provider that will be responsible to respond to the TSB result shall be identified on the lab requisition for reporting of critical values.

9.10 Information provided to guardian(s) prior to hospital discharge should include the following:

a) that jaundice is common, providing reassurance that it is usually transient and harmless;

b) factors that influence the development of significant hyperbilirubinemia such as lower gestational age, breastfeeding, and hemolytic disease;

c) a referral to the My Health Alberta: Healthy Parents, Healthy Children resource section on how to check the newborn for signs of increasing jaundice;

d) the designation of risk of hyperbilirubinemia and necessary follow-up for jaundice assessment;

e) to seek medical advice if visible jaundice is recognized as progressing, the newborn is not feeding well, has inadequate output, and/or decreased level of alertness;

f) with early discharge from hospital, the importance of seeking urgent medical advice if jaundice is recognized in the first 24 hours; and

g) advice on when and how to contact Health Link.
9.11 In communities without an established community TcB screening program (all communities outside of Calgary Zone - Urban), follow-up should be in accordance with the management and follow-up recommendations as per Appendix C.

9.12 In communities with an established community TcB screening program (Calgary Zone - Urban), community follow-up should be provided as per zone processes.

9.13 Assessment of newborn jaundice by Public Health Nurses shall be in accordance with recommendations in the Public Health Nursing Maternal/Newborn Practice Manual (0-2 months).

DEFINITIONS

Community means any member of the health care team that provides care in the community setting such as a Family Physician, Midwife, and Public Health Nurse or Laboratory Technician.

Direct antiglobulin test (DAT) means a test that detects the presence of antibodies bound to red blood cells.

Guardian means, where applicable:
For a minor:
   a) as defined in the Family Law Act (Alberta);
   b) as per agreement or appointment authorized by legislation (obtain copy of the agreement and verify it qualifies under legislation; e.g., agreement between the Director of Child and Family Services Authority and foster parent(s) under the Child, Youth and Family Enhancement Act [Alberta]; or agreement between parents under the Family Law Act; or as set out in the Child, Youth and Family Enhancement Act regarding Guardians of the child to be adopted once the designated form is signed);
   c) as appointed under a will (obtain a copy of the will; also obtain grant of probate, if possible);
   d) as appointed in accordance with a Personal Directive (obtain copy of Personal Directive);
   e) as appointed by court order (obtain copy of court order; e.g., order according to the Child, Youth and Family Enhancement Act); and,
   f) a divorced parent who has custody of the minor.

Health care professional means an individual who is a member of a regulated health discipline, as defined by the Health Disciplines Act (Alberta) or the Health Professions Act (Alberta), and who practises within scope and role.

Health record means the collection of all records documenting individually identifying health information, in relation to a single person.

Late preterm infant means an infant born between 35 weeks and zero (0) days and 36 weeks and six (6) days gestation.
Most responsible health practitioner (MRHP) means the health practitioner who has responsibility and accountability for the specific treatment/procedure(s) provided to a patient and who is authorized by Alberta Health Services to perform the duties required to fulfill the delivery of such a treatment/procedure(s) within the scope of his/her practice. (For the purposes of this document MRHP indicates Physician or Midwifery roles).

Phototherapy means an intensive light treatment used to treat jaundice. Phototherapy lights come in fluorescent, high-intensity fluorescent, fibre optic, or halogen. Different technologies provide different light intensities. Devices that emit lower irradiance may be supplemented with additional devices. Much higher doses (65 μW/cm²/nm) might have as yet unidentified adverse effects.

Severe hyperbilirubinemia means a total serum bilirubin concentration greater than 340 μmol/L at any time during the first 28 days of life (CPS 2016).

Total serum bilirubin (TSB) means the total serum bilirubin concentration in a capillary or venous blood sample, analysed in the lab.

Transcutaneous bilirubinometry (TcB) means a non-invasive, point-of-care estimate of total serum bilirubin concentration, based on the amount of bilirubin deposited in the skin, performed with a meter that uses multi-wavelength spectral analysis.

REFERENCES

- Appendix A: Acute Care Screening and Management for Hyperbilirubinemia
- Appendix B: Bhutani Predictive Nomogram for Designation of Risk of Hyperbilirubinemia
- Appendix C: Plan for Medical Follow-up Post Discharge
- Appendix D: Indication for Phototherapy or Exchange Transfusion
- Appendix E: TcB Nomogram for Term Newborn > 37 Weeks Gestation
- Appendix F: TcB Nomogram for Newborns Between 35-36 6/7 Weeks Gestation
- Appendix G: Reference List
- Alberta Health Services Governance Documents:
  - Consent to Treatment/Procedure(s) Policy Suite
- Alberta Health Services Resources:
  - Point of Care Testing Jaundice Meter Learning Module
  - Public Health Nursing Maternal/Newborn Practice Manual (0-2 months)
- Non-Alberta Health Services Documents:
  - Notice of Live Birth Form (Alberta)

VERSION HISTORY

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Acute Care Screening and Management for Hyperbilirubinemia

Newborn gestational age greater than 35 weeks

Assess risk factors for jaundice and perform assessment of feeding, hydration, output, level of alertness and visual assessment of color

YES → TcB available in hospital?

TcB within 24 hours
Repeat TcB next day and within 12 hours of discharge and ad hoc as needed

YES → Plot on TcB nomogram for gestational age

Green Zone → Routine care (consider risk factors, trends and clinical considerations)
Yellow Zone → Reassess for risk factors TcB TRENDING and clinical findings
Red Zone → Repeat TcB or TSB on next calendar day

NO → ESTABLISHED TcB Follow-up program in community? (Calgary Urban TcB Program)

TsB with NMS and/or at discharge

Plot on Bhutani Predictive Nomogram

TSB or TcB levels plot in the high intermediate or high risk zone?

TSB or TcB levels plot in the low or low-intermediate zone

If above from TcB result - obtain TSB and plot TSB on Phototherapy and Exchange Transfusion Graph

Refer to Appendix C for management and follow-up recommendations

Acute Care, prior to discharge: If there is no Established TcB Community Program in the community the baby is being discharged to, and TcB level plots in yellow or red zone, provide the parent with a lab requisition for a total serum bilirubin stat to be drawn the following day and a community physician identified for follow-up.

Public Health Follow-Up: refer to zone specific community follow-up guidelines.
APPENDIX B

Bhutani Predictive Nomogram for Designation of Risk of Hyperbilirubinemia

This nomogram is for use in communities where there is not an established TcB screening program. Both TcB and TSB levels may be plotted on this graph.

Plot the TSB value (μmol/L) or the TcB level vs. Age (hours) on the graph to determine the Risk Zone (Low, Low Intermediate, High Intermediate, High).
### APPENDIX C

**Plan for Medical Follow-up Post Discharge (Communities without established TcB Screening Program)**

**A**

Gestational age 35-37\(\frac{6}{7}\) wk + other hyperbilirubinemia risk factors*

Pre-discharge TSB or TcB

Plot on Bhutani Predictive Nomogram

- **High**
  - Evaluate for phototherapy
  - TSB in 4-8 h

- **High-intermediate**
  - Evaluate for phototherapy
  - TSB in 4-24 h

- **Low-intermediate**
  - If discharging before 72 h, follow up within 48 h; consider TSB at follow-up

- **Low**
  - If discharging before 72 h, follow up within 48 h

**B**

Gestational age 35-37\(\frac{6}{7}\) wk and no other hyperbilirubinemia risk factors OR gestational age greater than 38 wk + other hyperbilirubinemia risk factors*

Pre-discharge TSB or TcB

Plot on Bhutani Predictive Nomogram

- **High**
  - Evaluate for phototherapy
  - TSB in 4-24 h

- **High-intermediate**
  - Evaluate for phototherapy
  - TSB within 24 h

- **Low-intermediate**
  - If discharging before 72 h, follow up within 48 h and consider TSB

- **Low**
  - If discharging before 72 h, follow up within 48 h

(See next page for Part C)
Gestational age greater than 37.6/7 wk and no hyperbilirubinemia risk factors*  
Pre-discharge TSB or TcB  
Plot on Bhutani Predictive Nomogram

- **High**  
  Evaluate for phototherapy  
  TSB in 4-24 h

- **High-intermediate**  
  Follow up within 48 h;  
  consider TSB at follow up

- **Low-intermediate**  
  If discharging before 72 h,  
  follow up within 48-72 h

- **Low**  
  If discharging before 72 h, time  
  follow up according to age at  
  discharge or concerns other than  
  jaundice (e.g., breastfeeding)

*Newborns with additional risk factors for the development of hyperbilirubinemia include gestational age less than 38 weeks, exclusive or partial breastfeeding, isoimmune or haemolytic disease, sibling requiring phototherapy as a newborn, visible jaundice in the first 24 hours of life, cephalohematoma/severe bruising, any sustained fall, East Asian ethnicity, male gender, and/or maternal age greater than 25.
Indication for Phototherapy or Exchange Transfusion

Adapted from: Guidelines for detection, management and prevention of hyperbilirubinemia in term and late preterm newborn infants (35 or more weeks' gestation) - Summary. Paediatrics and Child Health. 2007;12(5):401-418.

- Infants at lower risk (> 38 weeks and no identified health concerns),
- Infants at medium risk (>38 weeks and risk factors that include: exclusive breastfeeding, isoimmune hemolytic disease, G6PD deficiency, previous sibling with jaundice requiring phototherapy as a newborn, asphyxia, respiratory distress, significant lethargy, temperature instability, sepsis, acidosis visible jaundice in the first 24 hours of life; cephalohematoma/severe bruising; East Asian ethnicity; male gender; and/or maternal age greater than 25.
- Infants at higher risk (35-37 6/7 weeks)

For well infants 35-37 6/7 weeks, adjust TSB levels for intervention around the medium risk line. It is an option to intervene at lower TSB levels for infants closer to 35 weeks and higher TSB levels for those closer to 37 6/7 weeks.

If the location of the point exceeds the appropriate risk category line for phototherapy, the MRHP should consider the need for phototherapy. If the location of the point exceeds the appropriate risk category line for exchange transfusion, an exchange transfusion may be warranted and the MRHP shall refer the newborn to a pediatrician or neonatologist for transfer to a neonatal intensive care unit (NICU). Intense phototherapy (>40µW/cm²/nm) must be instituted immediately while awaiting transfer as this can prevent the need for exchange transfusion in the majority of situations.
APPENDIX E

TcB Nomogram for Term Newborn > 37 Weeks Gestation
(Calgary Urban TcB Program, 2018)
APPENDIX F

TcB Nomogram for Newborns Between 35-36 6/7 Weeks Gestation
(Calgary Urban TcB Program, 2018)
REFERENCE LIST


*References accessed as of October 2018*