Alberta Health Services

GUIDELINE

TITLE

HYPERBILIRUBINEMIA SCREENING, ASSESSMENT AND TREATMENT – WELL NEWBORN 35 0/7 WEEKS GESTATION AND GREATER

SCOPE
Provincial: Postpartum and Well Newborn Care Areas

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Maternal, Newborn, Child & Youth Strategic Clinical Network

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Not applicable

SCHEDULED REVIEW DATE
March 18, 2023

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:
  - identifying newborns at risk for hyperbilirubinemia;
  - identifying neonatal hyperbilirubinemia in a timely and accurate manner;
  - providing timely interventions and/or treatment(s) as required; and
  - 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 Where available, a TcB shall be performed on all newborns born in hospital in the first 24 hours of life, in accordance with a structured jaundice management plan.

1.5 If TcB screening is not available in the hospital setting, a TSB shall be drawn prior to discharge. In the absence of clinical symptoms, the TSB should be completed within 24-36 hours, while the newborn is still in hospital, to coincide with the Newborn Metabolic Screen.

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

1.7 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.

1.8 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.

2.2 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.

2.3 In addition to initial TcB or TSB screening, Newborns who remain in hospital for longer than 24 hours should have repeat TcB or TSB screening performed daily until 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.

2.5 Predictive risk includes factors that determine how likely it is that the newborn may need treatment for jaundice. These factors influence the plan for medical follow-up post discharge. These factors include:

a) early onset jaundice (e.g. visible jaundice observed in the first 24 hours, and/or visible jaundice observed before discharge at any age);

b) less than 38 weeks gestation;

c) sibling who required phototherapy as a newborn;

d) significant bruising;

e) cephalohematoma;

f) male;

g) maternal age greater than 25 years;

h) Southeast-Asian, Mediterranean, African, Middle Eastern descent;

i) if exclusive breastfeeding is not going well and/or there is excessive weight loss (weight loss greater than 10%); and/or

j) dehydration.

2.6 Susceptibility risk includes factors that increase the risk of encephalopathy. These factors play a role in determining the newborn's designated risk line and potential need for treatment on the phototherapy and exchange transfusion graph (see medium risk line legend in Appendix D). These factors also influence the plan for medical follow-up post discharge. These factors include:

a) history of birth asphyxia;

b) sepsis/acidosis;

c) lethargy;

d) temperature instability;

e) isoimmune hemolytic disease (DAT positive);

f) G6PD deficiency; or

g) respiratory distress.

2.7 The process for screening the newborn with a gestational age of 35 weeks and greater for the risk of the development of hyperbilirubinemia is outlined in Appendix A1: *Acute Care Screening and Management for Hyperbilirubinemia- non Calgary urban* and Appendix A2- *Acute Care Screening and Management of Hyperbilirubinemia- Calgary urban*.

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 for in-hospital management of TcB and TSB results outside of Calgary urban facilities or Section 5 for in-hospital management of TcB and TSB results within Calgary urban facilities.

4. Hospital Management of TcB and TSB Results (Outside of Calgary 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. The zone in which the value falls in predicts the risk of the newborn developing hyperbilirubinemia.

4.2 If the TcB or TSB level plots on the Bhutani predictive nomogram (Appendix B) in the low or low-intermediate risk zone and the newborn has no risk factors, provide routine newborn care and continue TcB or TSB testing daily and prior to discharge.

4.3 If the TcB or TSB level plots on the Bhutani predictive nomogram (Appendix B) in the low or low intermediate risk zone and the newborn has risk factors (predictive and/or susceptibility), repeat the TcB or TSB within the next 24 hours, based on clinical judgement, and reassess the newborn's clinical status.

a) If there is no rising trend in the TcB level, provide routine newborn care and continue TcB or TSB testing daily and prior to discharge.

b) If there is a rising trend in the TcB level a TSB should be drawn (refer to Section 4.5).

c) The RN or LPN shall plot all TSB levels on the Indication for Phototherapy or Exchange Transfusion graph (Appendix D).

d) The RN or LPN shall notify the MRHP of the results to determine if further investigation, or other management is required (refer to Section 7).

4.4 If the TcB or TSB plots on the Bhutani predictive nomogram (Appendix B) in the high intermediate risk zone but there are no other risk factors or clinical symptoms, repeat the TcB or TSB within the next 24 hours based on clinical judgement, and reassess the newborn's clinical status.

a) If there is a rising trend in the TcB level a TSB should be drawn (refer to Section 4.5).

b) The RN or LPN shall plot all TSB levels on the Indication for Phototherapy or Exchange Transfusion graph (Appendix D).

c) The RN or LPN shall notify the MRHP of the results to determine if further investigation, or other management is required (refer to Section 7).

4.5 If the TcB level plots on the Bhutani predictive nomogram (Appendix B) in the high-intermediate zone and the newborn has other risk factors (predictive and/or susceptibility), or clinical symptoms, or the TcB plots in the high risk zone (regardless of risk factors), a TSB level shall be collected.

a) The RN or LPN shall plot all TSB results on the Indication for Phototherapy or Exchange Transfusion graph (Appendix D).

b) The RN or LPN shall notify the MRHP to determine if further investigation, or other management is required. (Refer to Section 7).

4.6 The MRHP shall consider the rate of rise (i.e. the slope of the graph related to the predictive line), and trending of either TcB or TSB levels, and clinical status. All treatment decisions shall be based on a TSB level (refer to Section 6).

4.7 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.

4.8 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. Hospital Management of TcB Results (Calgary 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 (see Appendix E); or

b) between 35-36 6/7 weeks gestation (see Appendix F).

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 on the Indication for Phototherapy or Exchange Transfusion Graph (Appendix D) 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 all TSB levels on the *Indication for Phototherapy or Exchange Transfusion* graph (Appendix D) to determine the potential need for phototherapy treatment or the potential for exchange transfusion and referral to Neonatology or Pediatrics.

6.2 If a TcB or TSB plots in the high intermediate or high risk zone on the Bhutani nomogram (Appendix B) but the subsequent TSB level does not fall above a risk line that indicates the need for phototherapy on the Indication for phototherapy or exchange transfusion graph (Appendix D) the newborn's TSB levels should be assessed for ascending rate of rise and if clinically indicated, a repeat TSB should be completed in 12-24 hours.

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

6.4 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 that have a TcB that 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 result confirmed with a TSB and 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 (Appendix D).

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 $\mu W/cm^2/nm$, 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

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, regardless of risk factors, who received phototherapy and are discharged at less than 72 hours of life; and

b) newborns who received phototherapy and are discharged before 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.

9. Discharge and Follow-Up in the Community

9.1 Medical follow-up planning for newborns according to gestational age, risk factors and identified Bhutani risk zone should be according to Appendix C.

9.2 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.

9.3 The health care professional shall provide the 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. The requisition shall include the name of the ordering physician as well as the primary health care provider who is responsible for the newborn's follow-up in the community, where available.

9.4 Newborns born in Calgary urban and discharged home outside of Calgary urban (Calgary zone rural and all other zones) with a TcB plotting in the red or yellow zone on the Calgary TcB nomogram should have a follow - up TSB (ordered by the MRHP) the day following discharge. The results should be reported to both the ordering and family physician.

9.5 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.

9.6 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).

9.7 In all areas except Calgary urban, the predictive risk zone on the Bhutani predictive nomogram (see Appendix B) 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.

9.8 Within Calgary urban 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.

9.9 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.

9.10 A copy of the newborn TcB nomogram should be provided to the newborn's guardian by the RN or LPN and sent to Public 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.

9.11 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.

9.12 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 Healthy Parents, Healthy Children Client Resource Card and recommend reading the 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.

9.13 In all areas outside of Calgary urban, medical follow-up should be in accordance with the management and follow-up recommendations as per Appendix C.

9.14 Public Health Nursing follow-up should be provided as per zone processes.

9.15 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.

Lethargy means that the baby appears to be listless and have little or no energy and is drowsy or sluggish. The lethargic baby may sleep longer than usual, be hard to wake for feedings and even when awake, may not be alert or attentive to sounds and visual cues.

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

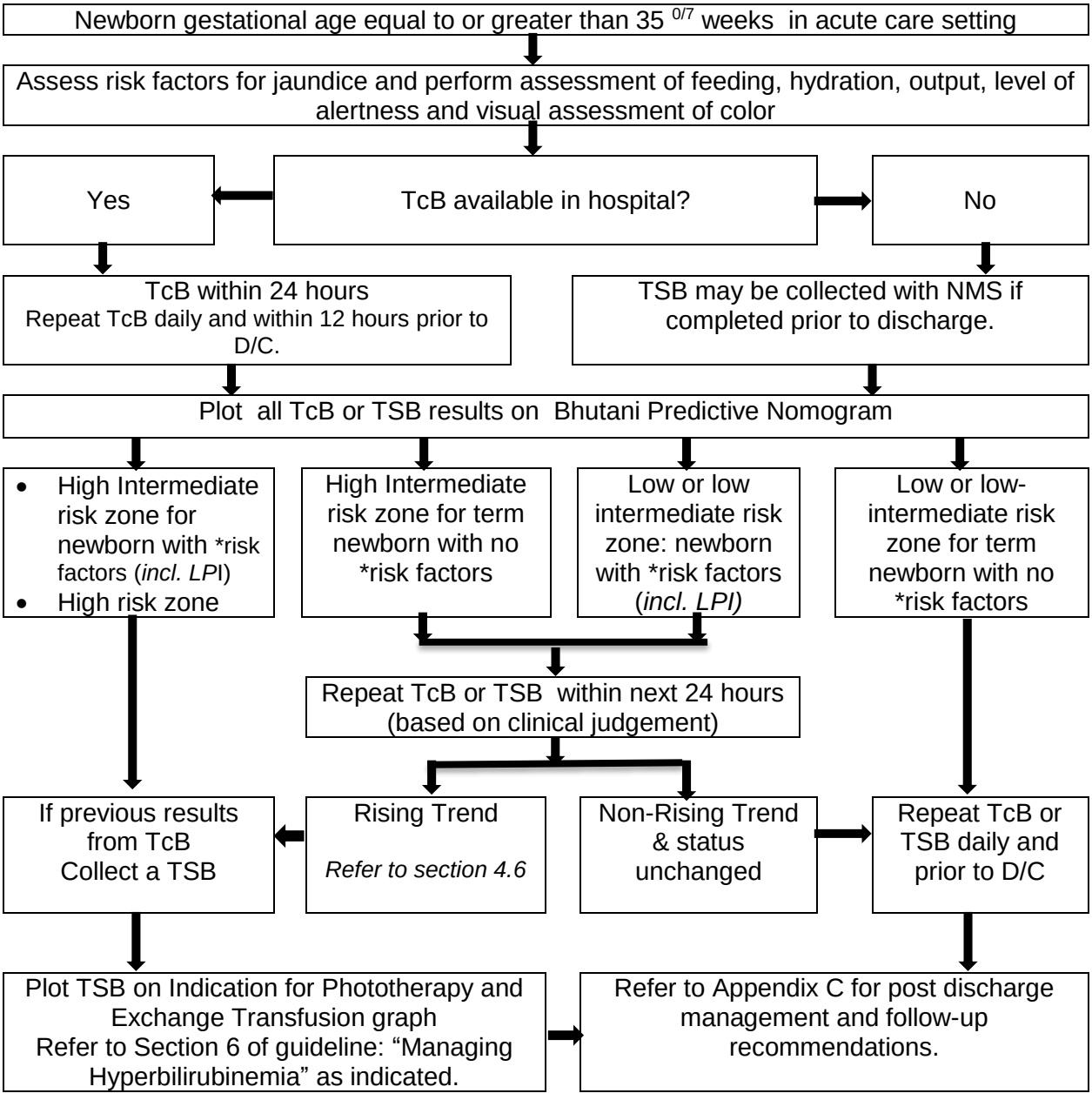
- Appendix A: *Acute Care Screening and Management for Hyperbilirubinemia* (*Non - Calgary Urban)*
- Appendix B: *Acute Care Screening and Management for Hyperbilirubinemia (Calgary Urban)*
- Appendix C: *Bhutani Predictive Nomogram for Designation of Risk of Hyperbilirubinemia*
- Appendix D: *Plan for Medical Follow-up Post Discharge (All Communities Other Than Calgary Urban)*
- Appendix E: *Indication for Phototherapy or Exchange Transfusion*
- Appendix F: *TcB Nomogram for Term Newborn > 37 Weeks Gestation*
- Appendix G: *TcB Nomogram for Newborns Between 35-36 6/7 Weeks Gestation*
- Appendix H: *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

Date	Action Taken
June 10, 2019	Revised
August 12, 2019	Revised
March 18, 2020	Revised, includes change in Title from “Hyperbilirubinemia Screening, Assessment and Treatment (Well Newborn Greater Than 35 Weeks Gestation)” and addition to Version History table “June 10, 2019 - Revised”
March 27, 2020	Non-substantive change

APPENDIX A

Acute Care Screening and Management for Hyperbilirubinemia (Non - Calgary Urban)



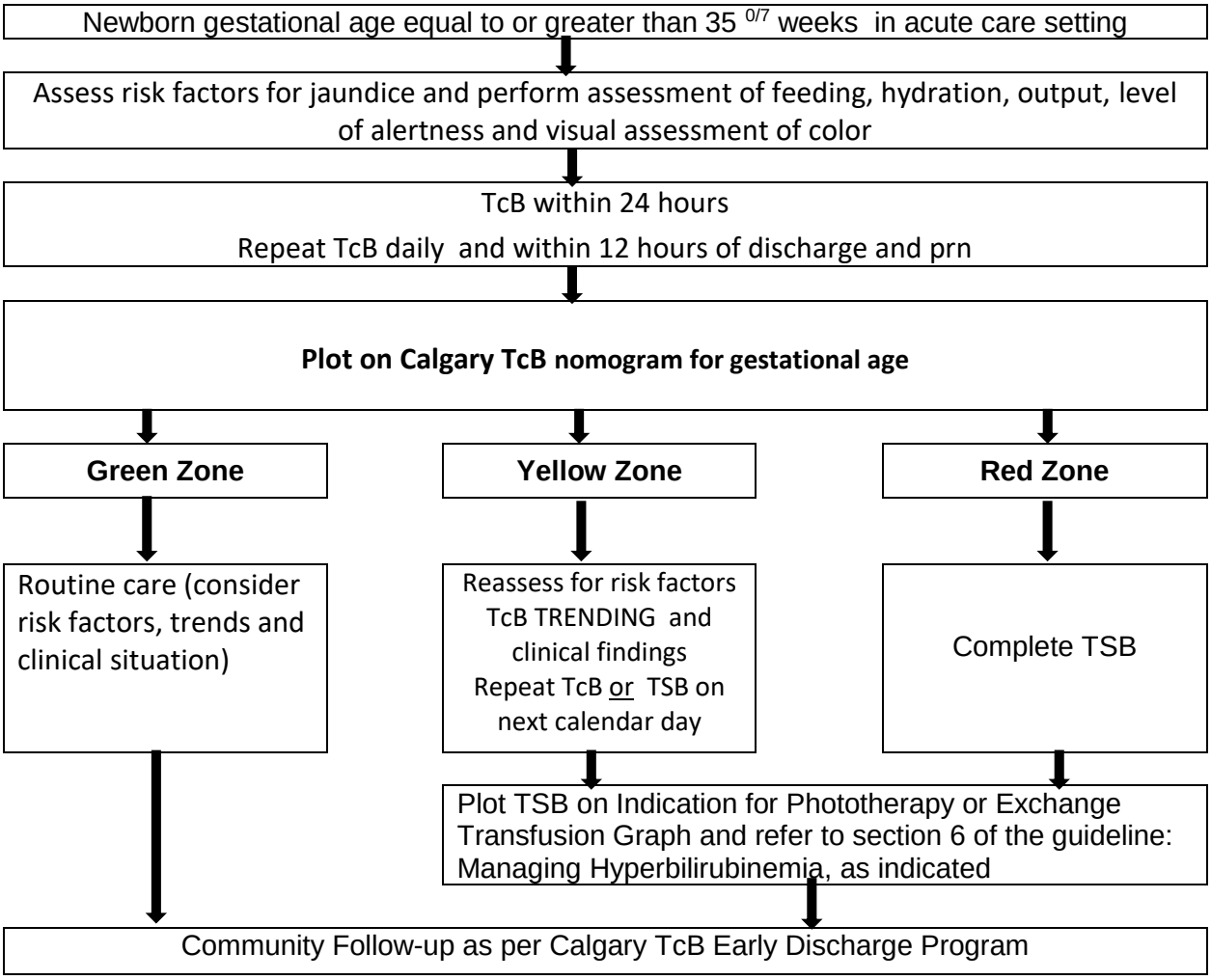
**Risk factors include those indicated under section 2.5 (predictability of developing jaundice) and section 2.6 (susceptibility of developing encephalitis) in this guideline.*

Note: The late preterm (LPI) should not be discharged prior to 72 hours.

Provide guardian with outpatient laboratory requisition for TSB as indicated in Appendix C

APPENDIX B

Acute Care Screening and Management for Hyperbilirubinemia (Calgary Urban)



If Calgary urban discharging to non-Calgary urban community 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 as per Neonatal Transcutaneous And Serum Bilirubin Screening – Public Health Postpartum Services, Calgary Zone – Urban"

APPENDIX C

Bhutani Predictive Nomogram for Designation of Risk of Hyperbilirubinemia

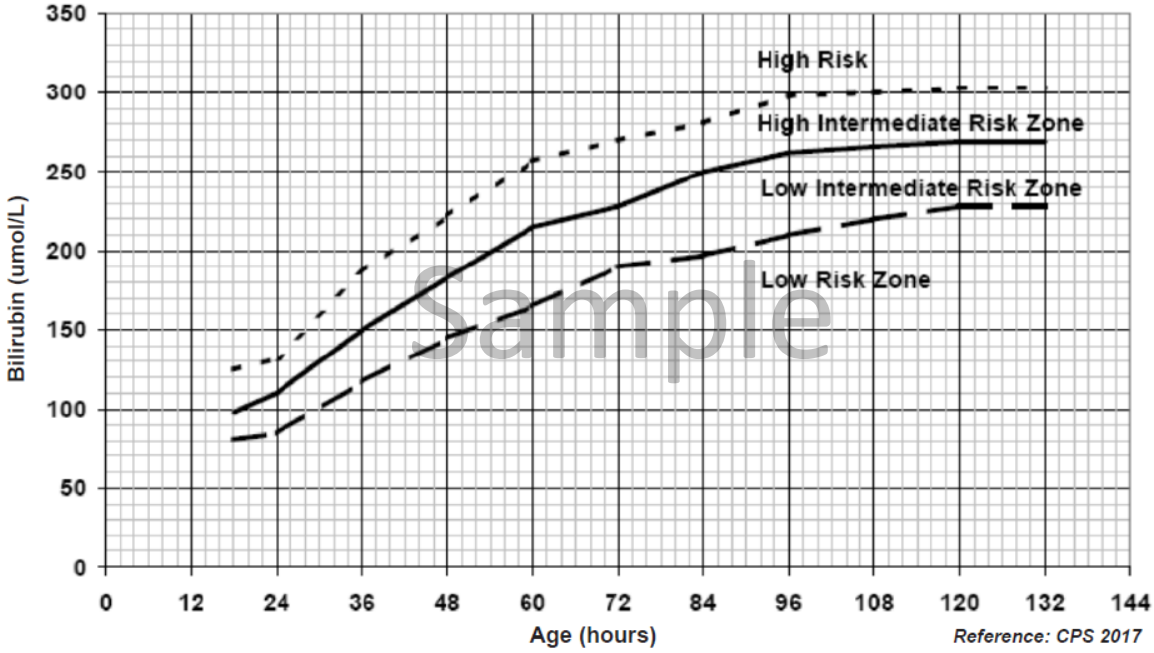
This nomogram is for use in communities where there is not an established TcB screening program.

Alberta Health Services

Predictive Nomogram for Designation of Risk of Hyperbilirubinemia (Bhutani)

Last Name	
First Name	
PHN#	Birthdate *(yyyy-Mon-dd)*

Time of Birth *(hh:mm)*	☐ Correct Nomogram Verified Initials _____



The zone in which the value falls predicts the likelihood of a subsequent bilirubin level exceeding the 95th percentile and that the newborn requires additional follow-up.

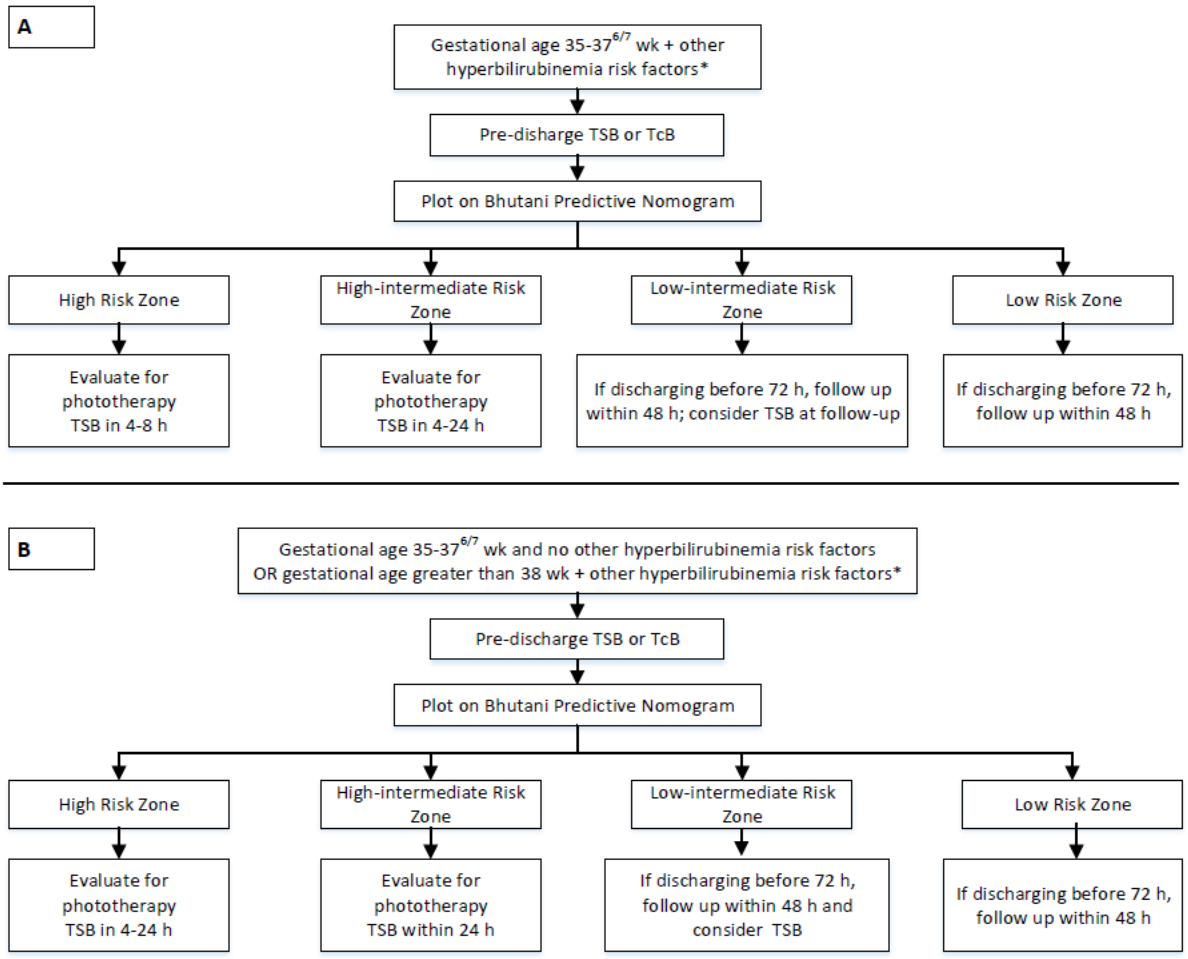
For use in all communities outside of Calgary metro. TSB and/or TcB levels may be plotted on this graph.

21246(Rev2019-03)

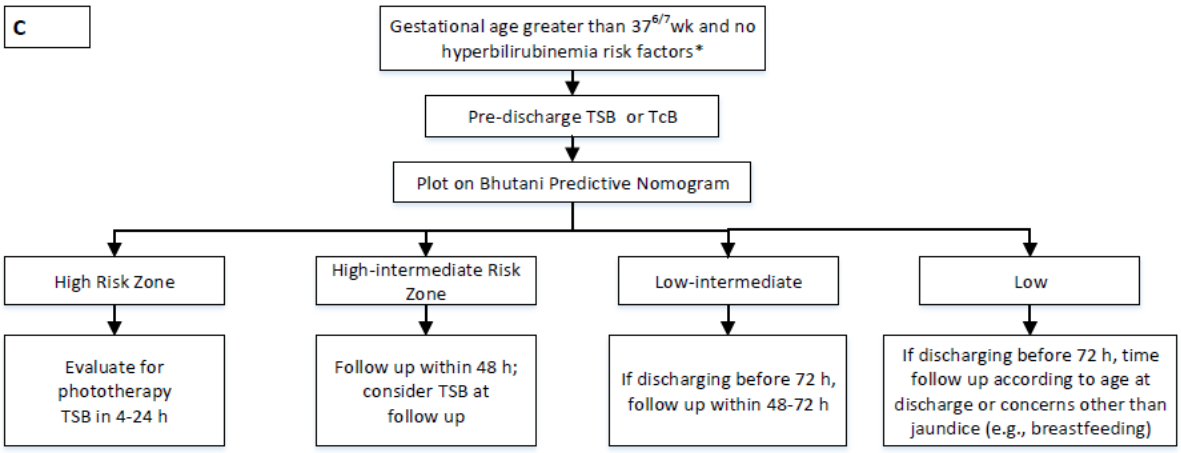
Both TcB and TSB levels may be plotted on this graph.
Plot the TSB value (µmol/L) or the TcB level vs. Age (hours) on the graph to determine the Risk Zone (Low, Low Intermediate, High Intermediate, High).

APPENDIX D

Plan for Medical Follow-up Post Discharge (All Communities Other Than Calgary Urban)



(See next page for Part C)



*Newborns with additional risk factors for the development of hyperbilirubinemia include both predictability and susceptibility factors: early onset jaundice (e.g. visible jaundice observed in the first 24 hours, and/or visible jaundice observed before discharge at any age); less than 38 weeks gestation; sibling who required phototherapy as a newborn; significant bruising; cephalohematoma; male; maternal age greater than 25 years; Southeast-Asian, Mediterranean, African, Middle Eastern descent; exclusive breastfeeding, if nursing not going well and/or excessive weight loss (weight loss greater than 10%) dehydration, history of birth asphyxia; sepsis/acidosis; lethargy; temperature instability; isoimmune hemolytic disease (DAT positive); G6PD deficiency; or respiratory distress.

Newborns in the low and low intermediate risk zones who are discharged at greater than 72 hours of age should be seen within seven days of discharge

APPENDIX E

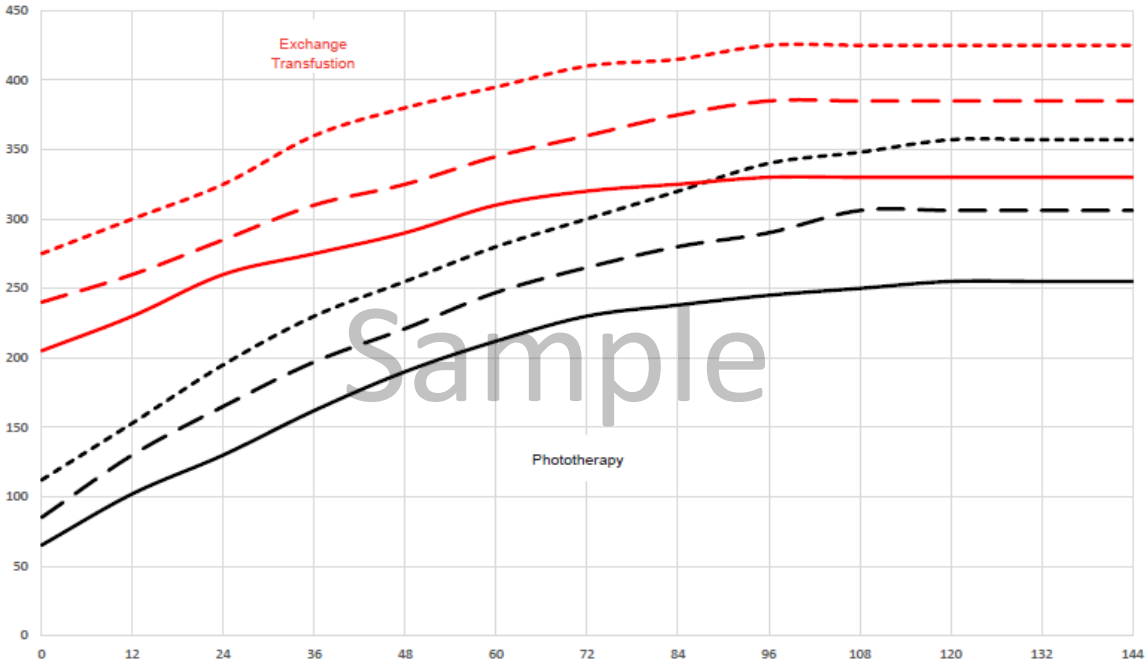
Indication for Phototherapy or Exchange Transfusion

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.

Alberta Health Services

Indication for Phototherapy or Exchange Transfusion

Last Name	
First Name	
PHN#	Birthdate *(yyyy-Mon-dd)*



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

---------- Infants at lower risk (greater than or equal to 38 weeks and no identified health concerns),

__ __ __ Infants at medium risk:

- *35 $^{0/7}$ to 37 $^{6/7}$ weeks and clinically well
- Greater than or equal to 38 weeks with susceptibility risk factors that include isoimmune hemolytic disease, G6PD deficiency, asphyxia respiratory distress, sepsis, acidosis, significant lethargy, temperature instability

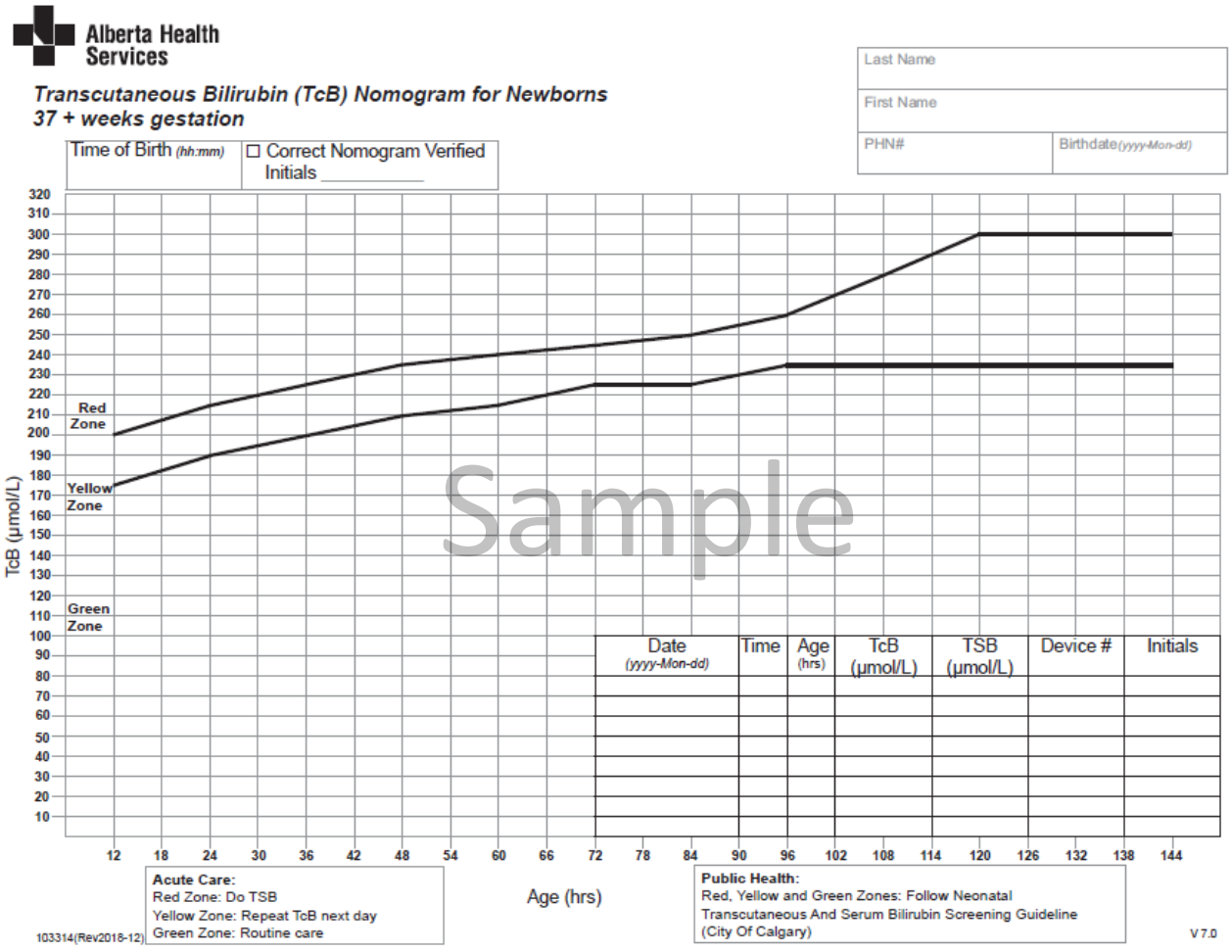
_____ Infants at higher risk (35$^{0/7}$-37 $^{6/7}$) weeks and clinically unwell or with susceptibility risk factors

*For well infants 35$^{0/7}$-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/cm^2/nm) must be instituted immediately while awaiting transfer as this can prevent the need for exchange transfusion in the majority of situations.

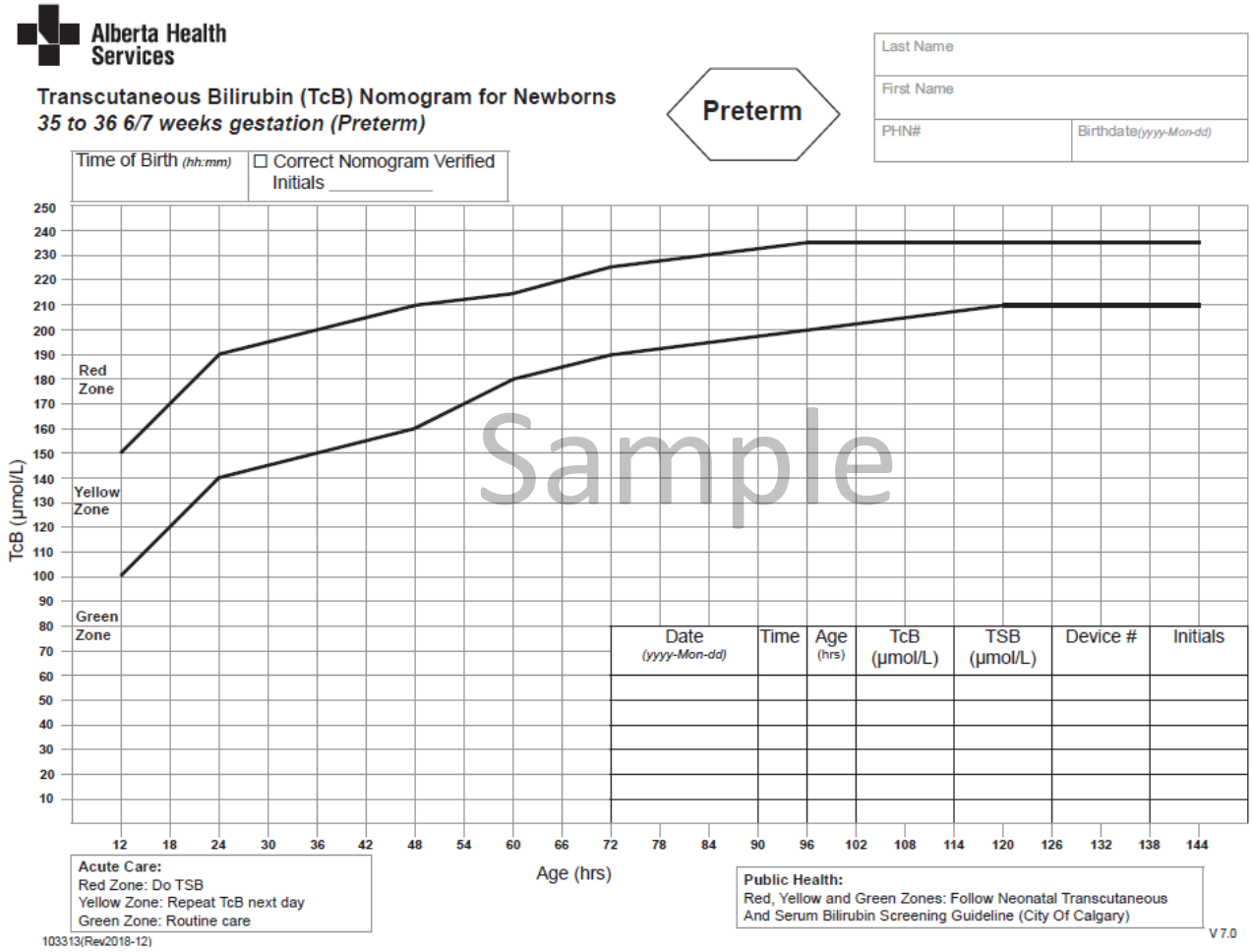
APPENDIX F

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



APPENDIX G

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



APPENDIX H

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