



CLINICAL PRACTICE GUIDELINE

TITLE

MANAGEMENT OF HYPERBILIRUBINEMIA IN THE COMBINED HOSPITAL – COMMUNITY HOME PHOTOTHERAPY PROGRAM

CODE

AUTHORIZED BY: Population and Public Health & Children's Hospital Emergency Department

EFFECTIVE DATE:
March 2, 2020

REVISED DATE
DECEMBER 2019

PAGE

PURPOSE

The purpose of these guidelines is to provide direction in the management of neonatal hyperbilirubinemia in Children's Hospital Emergency Department (ED) and in the community. These guidelines apply to the following health care providers in the Winnipeg Health Region: Children's Hospital Emergency Department Physicians and Nurses, Public Health Nurses (PHN), Pediatricians, Family Physicians, Community Emergency Physicians and Midwives.

GOALS

1. To ensure that families have access to evidence-based care for infants with neonatal hyperbilirubinemia by providing appropriate services in the hospital and community settings.
2. To provide a safe alternative to hospital care for infants who require phototherapy for uncomplicated neonatal hyperbilirubinemia.
3. To streamline the monitoring and follow-up in the community for the newborn/family with hyperbilirubinemia

SCOPE

- The target population for this guideline and algorithm (see Appendix A) is neonates requiring care for hyperbilirubinemia that can be provided in an outpatient setting.
- To be eligible for the Home Phototherapy Program, the infant must be assessed for eligibility and monitored by a pediatrician.
- Home Phototherapy is a treatment option for infants who meet the following criteria:
 - The infant is full term at birth (≥ 38 weeks gestation)¹
 - The infant is ≥ 48 hours of age at initiation of phototherapy
 - There are no co-existing indications for hospitalization
 - Serum bilirubin levels meet age appropriate criteria for the initiation of phototherapy but do not exceed these levels by ≥ 50 $\mu\text{mol/L}$ (see Appendix B)
 - The infant has no significant abnormalities, e.g., cardiac defect, Down Syndrome
 - The infant has no evidence of dehydration and is not $\geq 10\%$ below birth weight
 - The infant is passing urine and stool
 - The family resides in Winnipeg (temporary or permanent: includes those staying with family or in a boarding home / hotel for the duration of the phototherapy treatment)
 - Parents/caregivers consent to Home Phototherapy treatment
 - Pre-treatment laboratory analysis including serum bilirubin and Direct Antigen Testing (Coombs) is completed and the Coombs test is negative

¹The symbol \geq means "equal to or greater than", i.e., infant is equal to or greater than 38 weeks, 0 days gestation.



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RECOMMENDATIONS FOR CARE

The assessment of suspected cases of neonatal hyperbilirubinemia in the community may be initiated by the PHN, midwife, pediatrician, family physician or emergency physician. The assessment results in the following communications / referrals / processes.

1.0 Assessment of suspected neonatal hyperbilirubinemia by PHN / midwife during a home visit

1.1 Upon identification of a concerning degree of jaundice in a newborn in the home, the PHN / midwife discusses neonatal jaundice with the family and explains the process for further assessment and treatment. Home Phototherapy Program referral parameters include infants (see Appendices B & C) who are:

- 1.1.1 Full term at birth (≥ 38 weeks gestation)
- 1.1.2 ≥ 48 hours of age
- 1.1.3 No co-existing indications for hospitalization
- 1.1.4 No significant abnormalities, e.g., cardiac defect, Down Syndrome
- 1.1.5 No evidence of dehydration and not $\geq 10\%$ below birth weight
- 1.1.6 Passing urine and stool

1.2 The PHN / midwife consults with the family’s physician or pediatrician to inform him / her:

- 1.2.1 Of infant with potential for hyperbilirubinemia
- 1.2.2 To arrange same day pediatric appointment to rule out other causes for jaundice

1.3 If hyperbilirubinemia is suspected by a PHN / midwife but she / he is unable to make contact with the pediatrician, the PHN / midwife:

- 1.3.1 Refers the family for medical assessment and blood work to Children’s Hospital ED to rule out other causes for hyperbilirubinemia and assess for eligibility for the Home Phototherapy Program.
- 1.3.2 Leaves a message about the referral on the pediatrician’s / family physician’s answering service or office voicemail.

1.4 The PHN assesses breastfeeding and develops a feeding plan with the family.



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1.5 The PHN completes the *Community Health Services Communication Form* including the following information:

- 1.5.1 PHN contact information
- 1.5.2 Symptoms triggering the consult, e.g., jaundice, poor feeding (breast or formula)
- 1.5.3 Infant’s birth, discharge and current weight
- 1.5.4 Interventions e.g., breastfeeding support, explanation of phototherapy
- 1.5.5 Communication with Pediatrician

1.6 The PHN gives the Community Health Services Communication Form to the family with the instruction to share the information on the form with the pediatrician and / or Children’s Hospital ED and documents this on the public health client record.

1.7 The PHN / midwife follows up with the family the next day to ensure the infant was assessed by a pediatrician and / or in Children’s Hospital ED.

2.0 Assessment of suspected neonatal hyperbilirubinemia by other care providers

2.1 If a family physician or a physician in an ED other than Children’s Hospital suspects hyperbilirubinemia, the physician refers the family for medical assessment to a pediatrician or the Children’s Hospital Emergency Department to rule out hyperbilirubinemia from other causes.

3.0 Decision to proceed with the treatment plan

3.1 If the infant is deemed by the pediatrician to be eligible for the Home Phototherapy Program based on clinical assessment, the pediatrician sends the infant to Children’s Hospital ED.

3.2 The Children’s Hospital ED physician and nurse:

- 3.2.1 Assess the infant as per usual protocols.
- 3.2.2 Draw blood for serum bilirubin and Direct Antigen Testing (Coombs test).
- 3.2.3 Send the specimens to the Health Sciences Centre (HSC) laboratory (bilirubin) and Canadian Blood Services (Coombs).

3.3 The decision to treat the infant is made by the pediatrician / Children’s Hospital ED physician based on age appropriate treatment criteria / guidelines (Appendix C: *Guidelines for Total Serum Bilirubin Values for Phototherapy Without Risk Factors*).



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3.4 If the mother and infant are in the care of a midwife, the midwife transfers the care of the infant to the pediatrician for the duration of home phototherapy treatment. The midwife continues to be the primary care provider for the mother. Further involvement of the midwife (i.e., home visits) for the duration of the phototherapy will be in consultation with the PHN. The midwife will be kept informed of the infant’s bilirubin levels where possible.

3.5 If the level is below age appropriate treatment criteria, a decision is made by the pediatrician / Children’s Hospital ED physician that treatment is not necessary and determines follow-up.

4.0 Initiation of treatment by the Children’s Hospital ED

4.1 The ED nurse initiates treatment once the decision is made:

- 4.1.1 Explains the care of an infant with neonatal jaundice (if this has not already occurred).
- 4.1.2 Gives the family the Home Phototherapy Program Pamphlet (Appendix D).
- 4.1.3 Obtains written consent for treatment (Appendix E) and places it on the infant’s chart. If the parent does not consent to Home Phototherapy, the infant is admitted to hospital for treatment.
- 4.1.4 Applies the fiberoptic phototherapy unit to the infant.
- 4.1.5 Instructs the family on the care and use of the fiberoptic phototherapy unit.
- 4.1.6 Ensures the family has received adequate breastfeeding support using the questions in the pamphlet. If same-day breastfeeding support is required, see #5.
- 4.1.7 Documents the initiation of treatment.

4.2 The ED nurse communicates the referral to Public Health:

- 4.2.1 For all referrals, completes the *Home Phototherapy Referral* Form (Appendix F) including the following information:
 - Name and telephone number of infant’s pediatrician
 - Infant / mother’s name, current address and phone number / alternative phone number
 - Infant’s birth and current weight
 - Criteria met for referral to the program
 - Lab results i.e., bilirubin and other results as applicable
 - Parent education, breastfeeding support provided / required
 - Relevant family issues

4.2.2 **On weekdays**, the ED nurse faxes the referral form to Public Health Central Intake at 940-2635 and files the original form on the chart.



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4.2.3 *On weekend and statutory holidays*, the ED nurse faxes the referral to Public Health After-Hours at 940-2227 *and* Public Health Central Intake at 940-2635 for the PHN#1 to arrange for a PHN to monitor the infant and files the original form on the chart.

5.0 Providing breastfeeding education and support


5.1 If same day breastfeeding support is required weekdays during regular working hours (0830 -1630), the ED nurse will endeavor to assist the family as able and may also direct the family to contact the BFHL (breastfeeding hotline), their midwife or public health nurse as needed for additional support. The midwife / and or public health nurse will be available to provide breastfeeding support for clients in their care during regular working hours.

5.1.1 The ED nurse will complete the Home Phototherapy Referral form as soon as it is identified that the baby fits the criteria for / is a candidate for the Home Phototherapy Program and parental consent is obtained. The ED nurse will fax the referral form Public Health Central Intake at 940-2635. If the family **also** needs same day breastfeeding support, the ED nurse will indicate this on the referral form.

5.1.2 Upon receipt of the referral on weekdays during regular working hours (0830-1630), the PHN will contact the family by phone to assess their needs / provide support /plan for follow up as required.

5.2 If same day BF support is required on weekends or stats during regular working hours (0900-1700), the ED nurse will complete the Home Phototherapy Referral form as soon as it is identified that the baby fits the criteria and is a candidate for the Home Phototherapy Program and will fax the referral form Public Health Central Intake at 940-2635 **and** to PHCC (Provincial Health Calls Centre) at 940-2227 if the family **also** needs same day breastfeeding support.

5.2.1 Upon receipt of a referral for same day breastfeeding support on weekend / statutory holidays between 0900 and 1700, the PHCC calls the PHN #1 at (204) 795-1520 and informs PHN #1 that: “There is a newborn who has just been started on the Home Phototherapy Program and needs the support of a Public Health Nurse for breastfeeding today.”

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5.2.2 PHN #1 gathers the relevant information from PHCC (204-788-8327 and press #7):

- Infant/family’s name, address, phone number
- Infant’s birth, discharge and current weight

5.2.3 PHN #1 or designate contacts the family by phone during regular working hours to provide breastfeeding support / plan for follow up as required, completes a variance transfer form or progress note, and leaves the form with Public Health Central Intake.


5.2.4 Public Health Central Intake sends this documentation to the appropriate Community Area office the following morning (the Home Phototherapy Referral form from Children’s ED and the variance transfer form / progress note), or redistributes the referral if additional PHN service is still required the following day of a weekend or stat holiday.

5.3 If next day BF support is required on a weekday or weekend / stat (ie. referral is sent to Public Health late in the day or after hours), the ED nurse completes the Home Phototherapy Referral form as soon as it is identified that the baby is on the Home Phototherapy Program and needs next day breastfeeding support, faxes the referral form to Public Health Central Intake at 940-2635 and to PHCC at 940-2227 on weekends and stats. The PHN will follow up with the family by the next day during regular working hours.

5.4 Weekdays from 1630 to 0830 or weekends / stats after 1700, BF support by public health is not available. The ED nurse will endeavor to assist the family as able afterhours and / or connect them to the BFHL for additional support. The ED nurse will explain to the family that a PHN will contact them during regular working hours the same day or the next day to provide BF support services based on their assessed need and time of assessment in CH ER.

6.0 Monitoring of the infant by the PHN and the pediatrician

6.1 The PHN and pediatrician monitor (average duration of treatment is 3-4 days) the newborn *daily* using the parameters outlined in the algorithm and in Appendix B.

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6.2 If the infant has no designated pediatrician, consult the pediatrician on call for the Children’s Hospital Ambulatory Care group, Social Northern, and Ambulatory Pediatrics (SNAP) (contact through HSC paging at (204)787-2071)

6.3 The monitoring occurs as follows:

6.3.1 The PHN:

- Visits the family before noon (to ensure timely communication of lab results)
- Takes blood sample for serum bilirubin as outlined in Appendix G.
- Assesses the degree of infant jaundice
- Weighs the infant
- Assesses infant hydration / nutrition
- Completes the Public Health Infant Hydration Assessment forms
- Provides breastfeeding support in collaboration with the midwife as applicable

6.3.2 The PHN sends blood for serum bilirubin to the HSC laboratory by TFORCE

– Final Mile Canada Inc (formerly Dynamex courier) daily:

- Determines the infant identifier which will be “PHOT + infant’s birthdate” i.e., PHOT DD/MMM/YY (e.g., PHOT 02/Aug/06). This identifier **must be on all subsequent requisitions.**
- Completes the Lab Requisition.
- Label the specimen container: The name of the infant and at least one other unique identifier (eg. DOB or PHOT) must be marked on the sample. Can also include family MHSC #.

- ***On Weekdays:*** phones TFORCE Courier @ (204) 832-7171 and requests an **“On and Gone”** service to take blood sample to the HSC laboratory (the “On and Gone” service should deliver the sample to HSC within 1 hour.).

-Informs courier of the account information when calling for a pick-up, i.e., Account #18417 Code 8020. *(Refer to Home Phototherapy– Revised Memo dated May 18, 2018).

-***On Weekends / Stat Holidays:*** decided by consensus at 2016 PHN #1 meeting to transport specimens directly to HSC lab and not use courier due courier-related efficiency issues on weekends /stats.



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- Provides specific information on how to enter the client's home, e.g., entrance code if the client resides in an apartment building.
- Enters the courier tracking number in the designated column on the Bilirubin Monitoring Sheet for each courier trip.

6.3.3 The PHN obtains the bilirubin results 2 – 2 ½ hours from the time the blood is picked up by calling:

- The community area (CA) Public Health office to obtain the results.
- The HSC laboratory at (204) 787-1534 if unable to obtain result from CA Public Health office.

6.3.4 The PHN documents lab results and other relevant details on the Hyperbilirubinemia Monitoring Sheet (see Appendix H).

6.4 Note: No decrease or a rising serum bilirubin while the infant is on phototherapy should alert the PHN to the possible need for further medical assessment of the infant, particularly if the bilirubin is outside the allowable range (see Appendix A) and / or there are other symptoms. The PHN should contact the pediatrician and then instruct the family to take the infant to either the pediatrician or the Children's Hospital ED, depending on the direction received from or the availability of the pediatrician. The PHN refers the family to the Children's Hospital ED if unable to contact the pediatrician within 2 hours.

6.5 The HSC laboratory:

6.5.1 Auto faxes the lab results to Public Health Central Intake.

6.5.2 Sends the lab results to the pediatrician by fax or mail (depending on the pediatrician's preferred method). This does not replace direct daily communication of lab results with the pediatrician.

6.6 The PHN communicates regarding the infant's progress:

6.6.1 Phones the pediatrician daily, identifies self to reception as "Home Phototherapy Program", reports the bilirubin result and discusses the general status of the infant (e.g., feeding, weight, stools) with the pediatrician.

6.6.2 Liaises with the midwife as applicable.



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7.0 Discontinuation of home phototherapy

7.1 When the serum bilirubin meets criteria for discontinuing phototherapy (30 µmol/l or lower than the age appropriate level for initiation of phototherapy) the PHN confers with the pediatrician who makes the decision to discontinue phototherapy.

7.2 The PHN calls the family to discontinue phototherapy.

7.3 The PHN repeats the serum bilirubin the following day.

7.4 If the results remain below treatment level, the PHN:

7.4.1 Calls the pediatrician to confirm discontinuation of the treatment.

7.4.2 Makes arrangements for the courier to pick up and deliver the phototherapy unit to the Children’s Hospital ED (requesting 3-hour turnaround time). ***Please note that arrangements for the return of the home phototherapy equipment are to be done by the primary PHN on the earliest weekday following discontinuation of therapy on a weekend or stat.**

7.5 Once phototherapy is discontinued, care of the infant is transferred back to the midwife by the pediatrician.

8.0 Processing bloodwork for neonatal hyperbilirubinemia for the Home Phototherapy Program

8.1 The initial blood specimen for serum bilirubin will be sent to the Clinical Chemistry Dept at the HSC from Children’s Hospital ED

8.2 Subsequently, bloodwork will be sent directly to the HSC Clinical Chemistry laboratory by TFORCE courier from the family’s home

8.3 The Clinical Chemistry Dept. will process all blood specimens as soon as they are received

8.4 Initial results are sent by computer to the Children’s Hospital ED as soon as the sample is processed.

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8.5 Ongoing results will be:

8.5.1 Auto faxed to Public Health Central Intake at 940-2635.

8.5.2 Sent to the pediatrician by fax or mail (depending on the pediatrician's preferred method) for the patient records. This does not replace direct daily communication of the results to the pediatrician by the PHN.

9.0 VALIDATION

Jaundice is a common occurrence in the neonatal period and is usually benign. However, clinical assessment of the neonate is important to detect significant hyperbilirubinemia, provide appropriate intervention, and prevent serious complications. Since 1994, a Home Phototherapy Program has been available in Winnipeg. Approximately 75 infants per year have received Home Phototherapy since the inception of this program. Home Phototherapy treatment has resulted in safe care for these families with a 97% breastfeeding continuation rate and high family satisfaction. However, participation in this program has required daily travel to the Health Sciences Centre for blood work and assessment. This has presented hardship to the family and often redundancies in care between hospital and Public Health nursing. This practice guideline outlines collaboration between acute and community care providers to ensure safe, acceptable, and family-centered care for the infant with jaundice and the family. Continued evaluation of this innovative model of care will assist care providers to achieve these goals.

10.0 EVIDENCE

10.1 Canadian Pediatric Society, Fetus and Newborn Committee. Approach to the management of hyperbilirubinemia in term newborn infants (1999). *Pediatrics and Child Health* 4(2): 161-164.

10.2 Canadian Pediatric Society, Fetus and Newborn Committee. Use of phototherapy for neonatal hyperbilirubinemia. (1986). *Canadian Medical Association Journal* 134: 1237-1245.

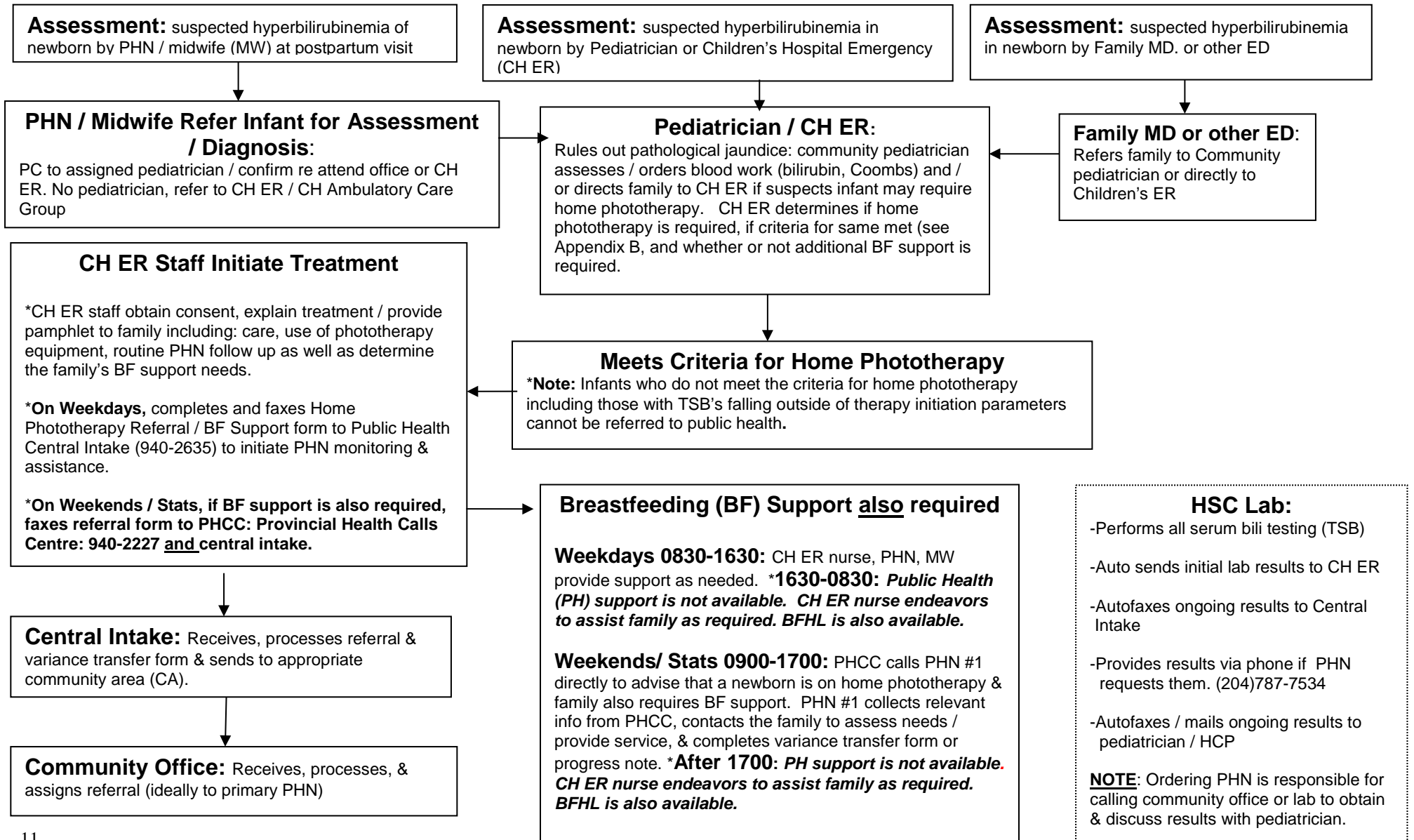
10.3 Sarici SU, Alpay F, Unay B, Ozcan O & Gokcay E. (1999). Comparison of the efficacy of conventional special blue light phototherapy and fiberoptic phototherapy in the management of neonatal hyperbilirubinemia. *Acta Paediatrica* 88(11): 1249-1253.

11.0 CONTRIBUTORS:

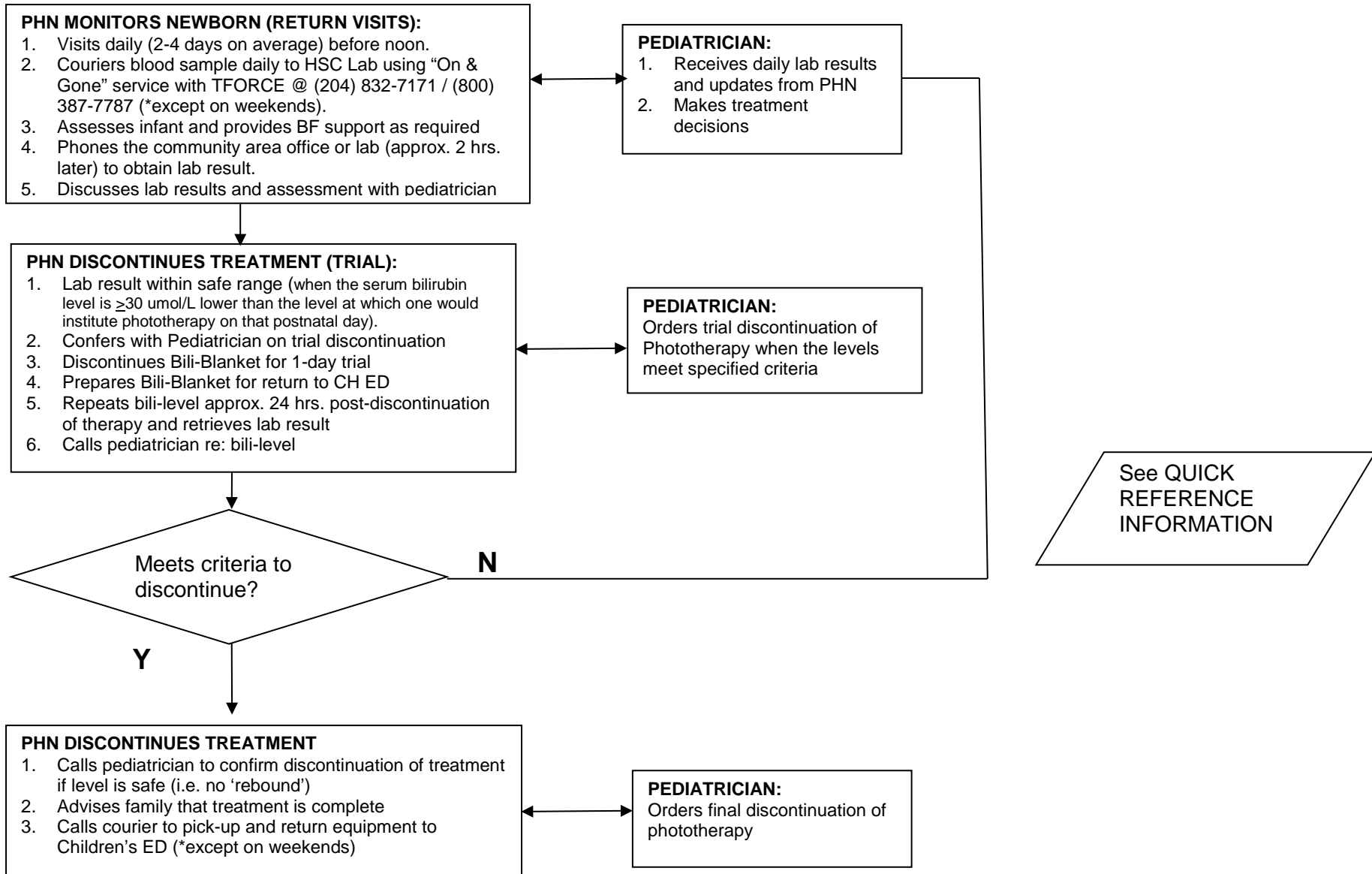
WRHA Population & Public Health (Clinical Nurse Specialist), Child Health (Community Pediatrics, Pediatric Emergency), and Primary Care (Midwifery)

Appendix A-1: Algorithm for Home Phototherapy Referrals / Breastfeeding Support Requests for Newborns Diagnosed with Hyperbilirubinemia

(CPG: Management of Hyperbilirubinemia in the Combined Hospital / Community Home Phototherapy Program revised by Public Health December 2019)



Appendix A-2: ALGORITHM for MONITORING and DISCONTINUATION of HOME PHOTOTHERAPY



APPENDIX B

HOME PHOTOTHERAPY PROGRAM QUICK REFERENCE INFORMATION

1. PUBLIC HEALTH NURSE

1.1 Hyperbilirubinemia Home Phototherapy Program Referral Parameters

- Infant is full term at birth (≥ 38 weeks gestation)
- ≥ 48 hours of age
- No co-existing indication for hospitalization & is Coombs negative
- No significant abnormalities, e.g., cardiac defect, Down Syndrome
- No evidence of dehydration and not $>10\%$ below birth weight
- Passing urine and stool
- Resides in Winnipeg

1.2 Community Health Services Communication Form Required Information

- PHN contact information
- Symptoms triggering the consult, e.g., jaundice, poor feeding
- Infant's birth, discharge and current weight
- Interventions e.g., breastfeeding support, explanation of phototherapy
- Communication with pediatrician

2. EMERGENCY DEPARTMENT NURSE

2.1 Home Phototherapy Communication To Public Health

Fax completed **Home Phototherapy Referral Form** to Public Health Central Intake including the following information:

- Pediatrician name and telephone number
- Infant / mother's name, current address and phone number & alternate contact number
- Infant's birth and current weight
- Criteria met for referral to the program
- Lab results i.e., bilirubin and other results as applicable
- Parent education, breastfeeding support provided / required
- Relevant family issues

2.2 Between 0830-1630 on weekdays and 0900 – 1700 on weekend / stats to obtain PHN BF support:

- Explain to family that a PHN will contact the family for breastfeeding support during regular working hours (M-F 0830-1630 and on weekends / stats 0900-1700). After hours BF support by PHN is not available.
- Provide Breast Feeding Hotline number as required (204) 788-8667.
- Complete the Home Phototherapy Referral Form and faxes it to Public Health Central Intake at (204) 940-2635 and also to After Hours (PHCC) at (204) 940-2227 on weekends / stats

3. HYPERBILIRUBINEMIA SERUM BILIRUBIN MONITORING

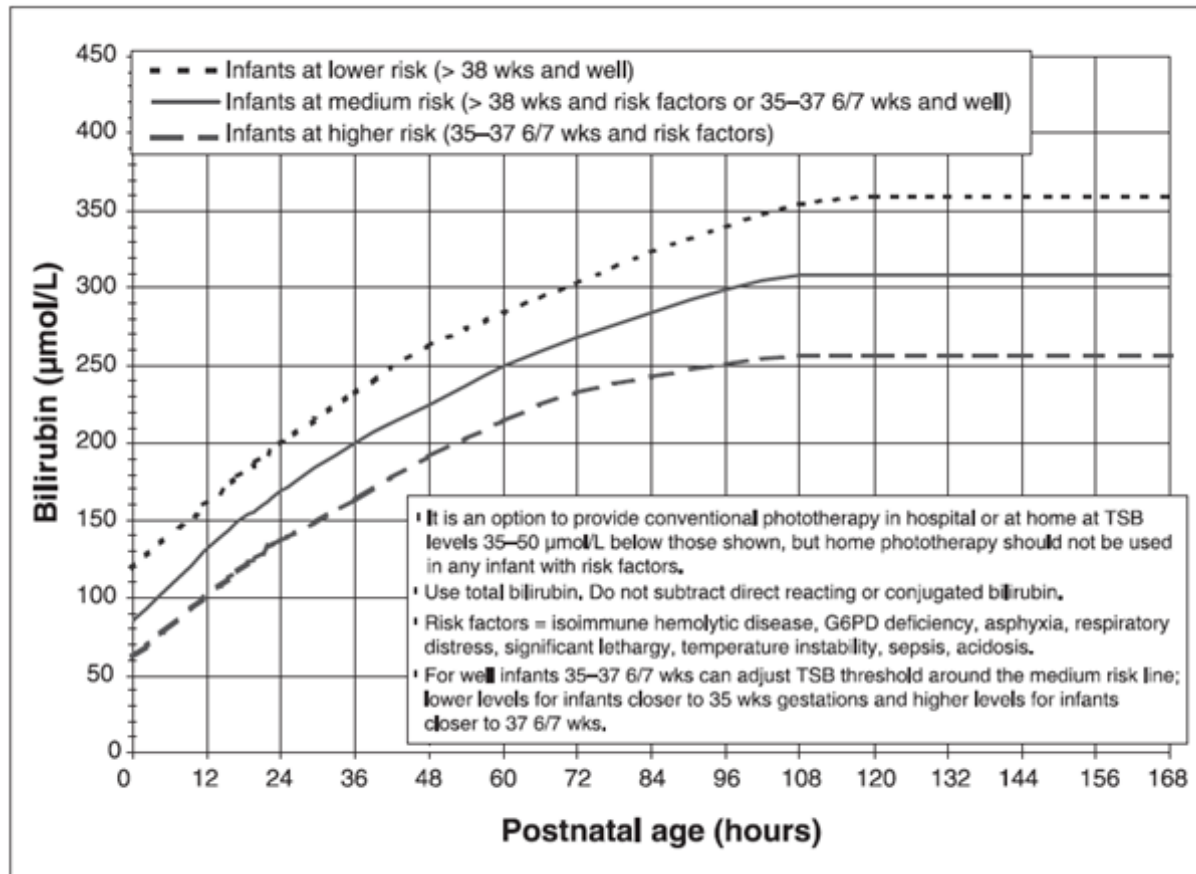
Age in hrs	Healthy Neonate ≥ 38 wk Normal Serum Bilirubin ($\mu\text{mol/L}$)	Lower and Upper Range for Home Phototherapy Serum Bilirubin Levels
48	$<260^*$	260-310
72	<300	300-350
> 96	<330	330-380

The symbol $<$ means "less than"

APPENDIX C: GUIDELINES FOR TOTAL SERUM BILIRUBIN VALUES FOR HOME PHOTOTHERAPY: INFANTS 38+ WEEKS WITHOUT RISK FACTORS

Note: For infants on home phototherapy, follow the TOP line (lower risk, 38+ weeks and well).

If levels are higher than the home phototherapy range, or if the above criteria are not met, the infant must be admitted for phototherapy.



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Acceptable Bilirubin Range for **HOME PHOTOTHERAPY**

Age in Hours	Serum Bilirubin Level for Home Phototherapy
≥ 48 hours	260-310
≥ 72 hours	300-350
≥ 96 hours	330-380

Serum bilirubin values are based on Canadian Pediatric Society statement: **APPROACH TO THE MANAGEMENT OF HYPERBILIRUBINEMIA IN TERM NEWBORN INFANTS**. Infants are **not eligible** for Home Phototherapy when serum bilirubin levels exceed age appropriate levels for the initiation of phototherapy by ≥50 µmol/L or if they are Coombs positive. Jaundiced infants with risk factors that have resolved (e.g., asphyxia) and are ≥48 hours of age may be candidates for Home Phototherapy provided all inclusion criteria are met.

A guideline for the discontinuation of phototherapy is when the serum bilirubin level is ≥30 µmol/L lower than the level at which one would institute phototherapy on that postnatal day.

WHO DO I CALL IF I HAVE QUESTIONS?

If you have any questions or concerns, please call:

- The Breastfeeding Hotline at 788-8667.
- Your Pediatrician if you have concerns about your baby's condition.

In an emergency, call 911 or take your baby to your nearest Emergency Department.

DISCHARGE QUESTIONS

These questions will be discussed with you by the nurse.

1. The Public Health Nurse visited me earlier today
YES NO
2. The Public Health Nurse provided teaching about feeding my baby today
YES NO
3. I know how to keep my baby feeding well
YES NO

If NO to questions #2 or #3:

The hospital will contact the Public Health Nurse to call you /come to your home to provide teaching and support during regular working hours (0830-1630 M-F, 0900-1700 weekends / stats).

APPENDIX D FAMILY PAMPHLET



Winnipeg Regional Health Authority Office régional de la santé de Winnipeg
Caring for Health À l'écoute de notre santé

HOME PHOTOTHERAPY PROGRAM

Family Pamphlet

Developed by the
Home Phototherapy Program
Working Group
Sept 26, 2006

Your baby needs to have phototherapy (photo = light; therapy = treatment) for newborn jaundice. This treatment will be in your home through the Home Phototherapy Program.

WHAT IS THE HOME PHOTOTHERAPY PROGRAM?

The Home Phototherapy Program is offered by Children's Hospital and Public Health. Your baby's treatment begins in the Children's Hospital Emergency Department and carries on in your home. The Public Health Nurse and your Pediatrician will check your baby's progress daily and provide support. The treatment usually lasts about 3-4 days.

WHEN IS TREATMENT STARTED?

To help decide if your baby needed phototherapy:

- A Pediatrician examined your baby
- A blood test was done to check your baby's bilirubin

The treatment of jaundice involves using a Bili-Blanket, which provides the special light treatment. The nurse and the **Parent's Guide** to using the Bili-Blanket explain how the phototherapy works.

Along with phototherapy, making sure your baby gets enough milk to drink is important to treat jaundice. The Public Health Nurse

will provide support to help you with breastfeeding your baby.

WHAT HAPPENS IN THE HOSPITAL?

Now that your baby is known to be suitable for treatment at home, the nurse will:

- Teach you how to use the Bili Blanket and equipment, which you will take home
- Review with you how this program works
- Inform your Public Health Nurse that you are going home with your baby on home phototherapy

WHAT HAPPENS WHEN I GO HOME?

When you go home you will begin the home phototherapy treatment on your baby. If needed, the Public Health Nurse will visit you today. The nurse may also visit you tomorrow and each day your baby is being treated for jaundice.

Each day, the Public Health Nurse will:

- Take a blood sample from your baby's foot and send it to the lab at the Health Sciences Centre for testing the bilirubin level
- Contact you and your baby's Pediatrician about your baby's blood test results
- Assess your baby's jaundice
- Assess your baby's feeding

- Weigh your baby
- Provide support for you and your family and answer any questions you may have

WHEN WILL PHOTOTHERAPY BE STOPPED?

Your baby's phototherapy will be stopped when the bilirubin test is within a safe range. When the nurse receives that result, she/he will:

- Contact the Pediatrician about stopping treatment
- Call you and ask you to stop the treatment
- Return the next day to do one more blood test

If the last bilirubin level remains in the normal range, the nurse will call you to let you know. The nurse will also call a courier to pick up the Bili Blanket during regular weekday hours.



APPENDIX E HOME PHOTOTHERAPY PROGRAM CONSENT FORM

On behalf of my baby, _____ as the parent/legal guardian, I agree to:
Baby's first and last name

Taking Part in Home Phototherapy and Being Responsible for Care:

I know that my baby has jaundice. I also know that phototherapy using the Bili-Blanket Phototherapy System has been ordered by a doctor.

The purpose, nature, expected outcomes and potential complications of home phototherapy have been discussed with me. Other options for treatment and what could happen if this treatment is not done have also been explained. I also know that home phototherapy is a safe option to treatment in hospital. It allows my baby to stay at home and helps with family bonding. I can feed and hold my baby during treatment.

I wish to use the Bili-Blanket for treatment of my baby. On behalf of my baby I consent to take part in home phototherapy.

I agree that visits by Public Health Nurses are required, and that my baby needs daily bilirubin blood tests.

I will watch and check my baby's intake and output. If asked by the nurse, I shall carefully check my baby, fill out and maintain record sheets to help my doctor treat my baby.

Training and Equipment:

I have been taught how to use the Bili-Blanket Phototherapy System and I agree to provide home phototherapy for my baby.

I have received the Parent's Guide to the Bili-Blanket Phototherapy System. I agree to read and follow the guidance it provides. I will perform all tasks and duties as stated.

The Bili-Blanket Phototherapy System belongs to the Winnipeg Regional Health Authority. It is loaned for my use. I agree that the Bili-Blanket System must be returned when treatment is stopped, in a clean and orderly manner.

I shall tell my Public Health Nurse about any problems with the equipment. I will stop using the Bili-Blanket if I have any concerns.

If I have any questions or problems I will contact my doctor or Public Health Nurse.

Date: _____

Parent/Legal Guardian's signature _____

Print Name _____

Witness Signature _____

Print Name _____



HOME PHOTOTHERAPY FAX REFERRAL

To: **Public Health Central Intake**
Fax: 940-2635; Phone: 940-2362

Pediatrician Name: _____
Fax: _____ Phone: _____

After Hours
Fax: 940-2227; Phone: 204-788-8327

From: Children's Hospital
Emergency Department
Fax: 787-1775; Phone: 787-4244

Date: _____ **Number of pages:** _____

Subject: Home Phototherapy Referral

If you do not receive all the pages, please contact the Children's Hospital Emergency Department at the above number.

DEMOGRAPHICS

Infant Surname _____ Given Name _____

Parent/Guardian Full Name _____

Current Address _____ Postal Code _____

Current Phone # _____ Alternate Phone# _____

Birth Date | D | D | M | M | Y | Y | Birth Time | | | | hr Birth Weight | | | | g Current Weight | | | | g

CRITERIA FOR HOME PHOTOTHERAPY REFERRAL (Check all boxes that apply)

- Infant was ≥ 38 wks gestation at birth
- Age is ≥ 48 hours at initiation of phototherapy
- No co-existing indication for hospitalization, e.g., dehydration, weight loss $\geq 10\%$ below birth wt
- Bilirubin is within range & documented on adjoining table
- Coomb's test is negative

Age in hrs	Normal Serum Bilirubin	Infant's Serum Bilirubin	Upper Serum Bilirubin Limit for Home Phototherapy
48	<260 $\mu\text{mol/L}$		310 $\mu\text{mol/L}$
72	<300 $\mu\text{mol/L}$		350 $\mu\text{mol/L}$
≥ 96	<330 $\mu\text{mol/L}$		380 $\mu\text{mol/L}$

On weekdays if all boxes are checked, fax referral to **Central Intake at 940-2635** (Phone: 940-2362)
On weekends/stats if all boxes are checked **also** fax referral to **After Hours at 940-2227** (Phone: 940-3644)

REQUIRES BREASTFEEDING SUPPORT (Check all boxes that apply)

- Requires same day BF support during regular working hours (0830-1630 weekdays or 0900-1700 weekends / stats).
 - Requires next day BF support
- On weekends / stats if all boxes are checked, **also** fax referral to **After Hours at 940-2227** (Phone: 940-3644).
****After hours BF support by Public Health is NOT available on weekdays (1630-0830), weekends or stats (1700-0900)**

COMMENTS (relevant family issues etc.)

Sending Staff Member: _____ (Print Name) _____ (Time)

APPENDIX G

Taking a Newborn Bilirubin Sample

Equipment required:

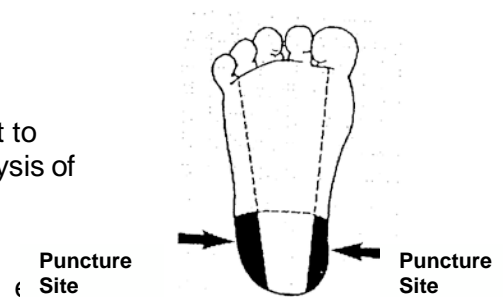
- Requisition
- Permanent Marker
- Paper towel/incontinent pad
- “Urgent” stickers and HSC labels
- Plastic biohazard bag and strip
- SAFT Pak with HSC URGENT label
- Hand sanitizer
- Gloves
- Bilirubin tube (Microtainer)
- Alcohol swabs
- Vaseline Petroleum Jelly
- Sterile 2X2 gauze
- Sterile disposable lancets (safety engineered)
- Small sharps container *
- Circular band-aids (optional)

Procedure:

1. Explain the procedure and rationale for the blood test. Discuss methods to soothe and alleviate any infant pain that may be associated with the heel stick procedure. Strategies including breastfeeding, pacifier use to promote non-nutritive sucking (if the infant has been using a pacifier), kangaroo care or skin to skin holding, and swaddling, are all non-pharmacological methods of pain relief available to families in the community.
2. Advise the family on how the results will be handled.
3. Complete the HSC Requisition.
 - Infant’s last name, first name
 - Date of birth
 - MHSC #
 - Sex
 - Reference number - use infant’s birthdate as Day-Month-Year, i.e. PHOT 06Aug2006
 - Name of physician ordering test – Pediatrician’s first and last name
 - Collection date
 - Collection time
 - Name & phone number of nurse collecting the sample
4. Label sample using permanent marker to print the infant’s last name and given name, as well as one other unique client identifier (eg. DOB or PHOT) before collecting the blood (easier to read and free of blood smears/spatters). Can also add the family MHSC # on the microtainer tube. The specimen may be rejected if not labeled correctly. Wait for the ink to dry before using the microtainer or use a small label to wrap around tube.
5. Gather all necessary equipment. (lancet, microtainer, alcohol swab, gauze, tape/bandage). Create a clean area for the supplies by using a paper towel, an incontinent pad or a clean towel from the client.
6. Open the Vaseline and squeeze a small amount onto the lancet package opposite the opening.
7. Wash hands with Sanitizer and put on gloves.
8. While it is unnecessary, you may place the infant’s limb in a dependent position to assist blood flow. Warm the infant’s foot by wrapping the foot with a disposable diaper or face cloth

warmed with tap water for 3-5 minutes to enhance blood flow. Note: If puncture needs to be repeated, it will be necessary to re-warm the foot.

9. Turn off the bili blanket during the blood collection to avoid the risk of the light reaching the sample.
10. Select the puncture site as indicated in the diagram avoiding previous puncture sites.
11. Massage foot to increase circulation/blood flow. It is important to release pressure to avoid bruising the infant or causing hemolysis of the sample
12. Clean the puncture site with alcohol. Air dry.
13. Apply Vaseline to site (minute amount) with the Lancet package. This will cause the blood to form drops.
14. To take the sample:



- Remove the green top from the microtainer tube. The flotop (“scoop”) is incorporated at the top of the tube to facilitate collecting blood droplets.
 - Using firm pressure, place sterile disposable lancet firmly on heel. Release blade.
 - Blot away the first drop of blood with a dry gauze as it is considered contaminated with excess tissue fluid.
 - Squeeze the foot to let a large drop of blood to form.
 - Touch the top (scoop) of the bilirubin tube to the blood and allow it to slide down the tube.
 - Fill to the level between the 400 and 600 ul (do not overfill).
 - Seal the microtainer with green top when specimen collected
 - Place the sample and the absorbent strip into the biohazard bag and seal
15. Once the collection is complete, elevate the foot above the body. Apply steady pressure to the heel with clean gauze until bleeding stops. Secure gauze by taping it to the heel. You may instruct the parent to remove the gauze after one hour.
 16. Dispose of lancet in a “sharps” container.
 17. Discard all other disposable items by grasping items in the palm and pulling glove “inside-out.” Dispose of the garbage in the client’s home.
 18. Wash hands.
 19. Write “blood sample” on the paper biohazard envelope.
 20. Insert plastic biohazard bag into the paper biohazard envelope.
 21. Place biohazard envelope and requisition into the SAFT Pak Transport box labeled with HSC address and Urgent sticker. Close lid of box.

NB. It is not necessary to “mix” the blood in the microtainer with the anti-coagulant. The blood sample will be “spun” and only the serum is used to test for bilirubin level.

NB. A small to moderate amount of hemolysis of the sample is within normal limits.

APPENDIX H



**PUBLIC HEALTH HYPERBILIRUBINEMIA
MONITORING SHEET**

DATE:

TIME:

CLIENT DATA

Identifying #:	PHOT _____	Birthdate:	_____
	DD/MMM/YY	Gestation:	_____
Name:	_____	Hospital of Birth:	_____
Parents:	_____	Discharge Date:	_____
Address:	_____	Birth Weight	_____
	_____	Discharge Weight:	_____
Phone #:	_____	Emergency Weight	_____
Pediatrician:	_____	Breastfeeding:	_____

LAB DATA

Initial	Date/Time	Results	Weight	MD Notified	PHN Signature
Bilirubin		mmol/L @ ___hr			
Hemoglobin					
Sodium					
Potassium					
Coombs					

Follow-up

Bilirubin		mmol/L @ ___hr			
Bilirubin		mmol/L @ ___hr			
Bilirubin		mmol/L @ ___hr			
Bilirubin		mmol/L @ ___hr			
Bilirubin		mmol/L @ ___hr			
Bilirubin		mmol/L @ ___hr			

PROGRAM DATA

Phototherapy

Start Date:

Trial D/C'd Date:

Discontinued Date: