PURPOSE

To maximize desired effects and minimize complications from the administration of phototherapy, the following practices are to be used when an infant is receiving phototherapy.

POLICY STATEMENT

Bilirubin is the end product of the breakdown of heme. It is hydrophobic and lipophilic and is able to pass freely through biologic membranes. Albumin binds bilirubin and transports it to the liver where it is modified by addition of one or two molecules of glucuronic acid making it soluble enough to be excreted in urine and bile.

The primary event in phototherapy is the absorption of a photon by a bilirubin molecule. Absorption of the photon “excites” the bilirubin. Bilirubin can re-emit the photon (0.1%), produce heat (80%), or undergo a photochemical reaction (20%). There are three types of photochemical reactions: configurational isomerization, structural isomerization (creation of lumirubin) and photo-oxidation. It is believed that the most significant “bilirubin reducing” effect of phototherapy is the production of lumirubin and its excretion in bile and urine. The formation of lumirubin from bilirubin is dependent on the spectrum of light used in phototherapy and the total dose of light received. The efficacy of phototherapy is therefore dependent on the type of light used (spectrum & intensity) and the surface area of skin exposed to the light.

APPLICABILITY

All Covenant Health Neonatal Nursery staff.

EQUIPMENT

- Phototherapy Unit
- Eye Patches
- Eye Lubricant
PROCEDURE

ACTION

• Apply eye lubricant to eyes. Ensure eyelids are shut and cover with opaque phototherapy eye patches. Secure eye-patch ensuring eye-patches do not put pressure on eyelids.

• Expose all skin under phototherapy light. Minimize the size of the diaper on the baby by folding excess material over. Consider placing a diaper under the baby and covering genitalia with a surgical mask to catch urine and stool if the bilirubin is considered excessively high. Phototherapy “spot” lights may not expose entire body to light. CPAP cap remains on if CPAP is in use and avoid spotlight phototherapy on the face.

• Place phototherapy units so that lights align perpendicular to the infant’s skin.

• Adjust phototherapy unit to be as close to patient as possible as per the manufacturers recommendation.

• Cover pulse oximetry probe with an occlusive wrap when using phototherapy.

• Reposition every 2-4 hours.

• Routine eye care should be performed a minimum of every 4 hours. This consists of removing eye patches, checking for signs of conjunctivitis or irritation and reapplying lubricant as well as routine eye care. Document on the MAR each administration of eye lubricant.

• Monitor temperature 1 hour after initiation of phototherapy if the environment and amount of clothing has changed for the baby.

RATIONALE

• Lubricant will prevent corneal drying. Covering the eyes prevents retinal damage from the intense light.

• Expose maximum skin surface to light.

• The light is most effective when it strikes the skin at a 90° angle. This is very important for fluorescent light banks since their irradiance levels are low.

• Irradiance is affected by distance to patient. It decreases the farther the lights are from the skin.

• The intense light of phototherapy can interfere with pulse oximetry.

• Repositioning exposed areas of skin (hence bilirubin) to phototherapy.

• Eye injury and infection may be prevented by constant protection of the infant’s eyes.
• Assess skin for changes during phototherapy. Avoid use of ointments or creams on exposed skin.

• Erythema may occur as a result of phototherapy. It presents no danger to the infant and should resolve once phototherapy is stopped. Creams and ointments can cause burns under phototherapy.

• Determine frequency of serum bilirubin levels according to the Neonatologist/designates orders and Kardex this information.

• To monitor the trend of bilirubin levels during and after phototherapy.

• Allow parents to hold infant if condition is stable. Remove eye-patches and explain behaviour of infant and reasons for it. Show ways to provide comfort and care to infant while phototherapy in use. Consider use of a biliblanket to promote ongoing skin to skin care.

• Phototherapy is effective when administered for a minimum of 21 hours per day. Phototherapy may case behavioural changes such as irritability or lethargy and changes in stool colour.

• During administration of packed red blood cells or TPN, cover IV tubing exposed to phototherapy with opaque material.

• Phototherapy can cause haemolysis of RBCs and photo degradation of TPN constituents.

RELATED DOCUMENTS
Adapted with permission from Stollery Children’s Policy and Procedure Manual:

REFERENCES:


REVISIONS:  April, 2003  
August, 2015
SIGNATURES

ORIGINAL SIGNED

_______________________
GAIL CAMERON
Senior Director, Operations
Women’s and Child Health
Covenant Health

SEPTEMBER, 2015

DATE

ORIGINAL SIGNED

_______________________
DR. SHARIF SHAIK
Medical Director, Neonatology
Misericordia Community Hospital
Covenant Health

SEPTEMBER, 2015

DATE

ORIGINAL SIGNED

_______________________
DR. PAUL BYRNE
Medical Director, Neonatology
Grey Nuns Community Hospital
Covenant Health

SEPTEMBER, 2015

DATE