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Neonatal Jaundice

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What is jaundice?

- Yellow discoloration of the skin and mucous membranes.
- 'Hyperbilirubinaemia' = High levels of bilirubin in the blood
- If untreated , it can cause 'Kernicterus' – a yellow colouring of the brain with long-term cerebral and sensory damage
- Jaundice affects 80% of preterm newborn and 45-60% of full term neonates
- Truman, 2006; Turnball & Petty, 2012

Physiology of Jaundice

- Bilirubin – a product of haem breakdown, the red protein of the erythrocyte, processed in the liver and spleen.
- Bilirubin is conjugated by enzymes in the liver by converting insoluble unconjugated to water soluble bilirubin for excretion
- Conjugated bilirubin is excreted into bile and then into the duodenum and small intestine

Why do babies become jaundiced?

- Accelerated red blood cell breakdown
- Decreased removal of bilirubin due to transient liver enzyme insufficiency.
- Increased re-absorption (back to the enterohepatic circulation) / slow to feed
- High red cell load

Physiological jaundice

- Normal physiological process
- Onset on day 3 – 7
- May not require active treatment
- Excessive bruising / mode of delivery may increase the risk
- Breast feeding may increase the duration of physiological jaundice without concern

Pathological jaundice

- Early onset – on day 1 with rapis rise in bilirubin leading to double, even triple phototherapy or exchange tranfusion (worse case scenario)
- Caused by a disease process leading to inclreased / rapid haemolysis (breakdown) of red blood cells or a defect in the bilairy system

- Examples …..
- Haemolytic Jaundice / blood group incompatibility.
- Congenital infection and/ or acquired infection (e.g. Hapatitis)
- Certain diseases such as G-6PD deficiency & metabolic conditions (e.g. galactosaemia)
- Biliary atresia

Late / prolonged jaundice

- Prolonged Jaundice that persists past 14 days
- Requires a prolonged jaudice screen and it needs to be ascertained that the high bilirubin is a conjugated form (more harmless)
- Breast milk
- Conjugated jaundice due to prolonged TPN when bowel is not functioning properly
- Metabolic conditions

Identification of Jaundice

- OBSERVATION
- Bilirubin measurement either by blood (setrum builirubin (SBR) OR by transcutaneous (skin) reading for neonates over a certain gestation
(NICE, 2010, 2012)

Investigations ....

- Coombs test
- Full infection screen
- Blood and urine test:
- Urine for conjugated bilurubin
- Infant's blood group
- Mother's blood group
- Haemoglobin, blood film and reticulocytes
- Prolonged Jaundice Screen?

Management

- Obtain SBR or TcBR and plot on Jaundice Threshold graph suitable for age / gestation

Summary for healthy, term babies:

Day of life	**1**	**2**	**3**	**4**	**5**
SBR	200	260	320	350	360

- If over threshold, start phototherapy

Phototherapy

- Works by converting unconjugated bilirubin by photo-degration to a biliverdin-like pigment, which is water-soluble and harmless. i.e. the bilirubin is *conjugated & excreted*
- Range of maximum absorption of bilirubin 400-500 nanometer - blue spectrum of light
- Plot bilirubin chart
- Determine appropriate mode
- Wentworth, 2005

Giving Phototherapy

- Conventional light - Halogen spotlight or strip lights
- Fibreoptic light
- Bilibed
- Biliblanket

- Double / Triple Phototherapy?
- SKIN IRRADIANCE – NEEDS TO BE OPTIMUM. By maximising skin exposure with light at the ideal distance away.

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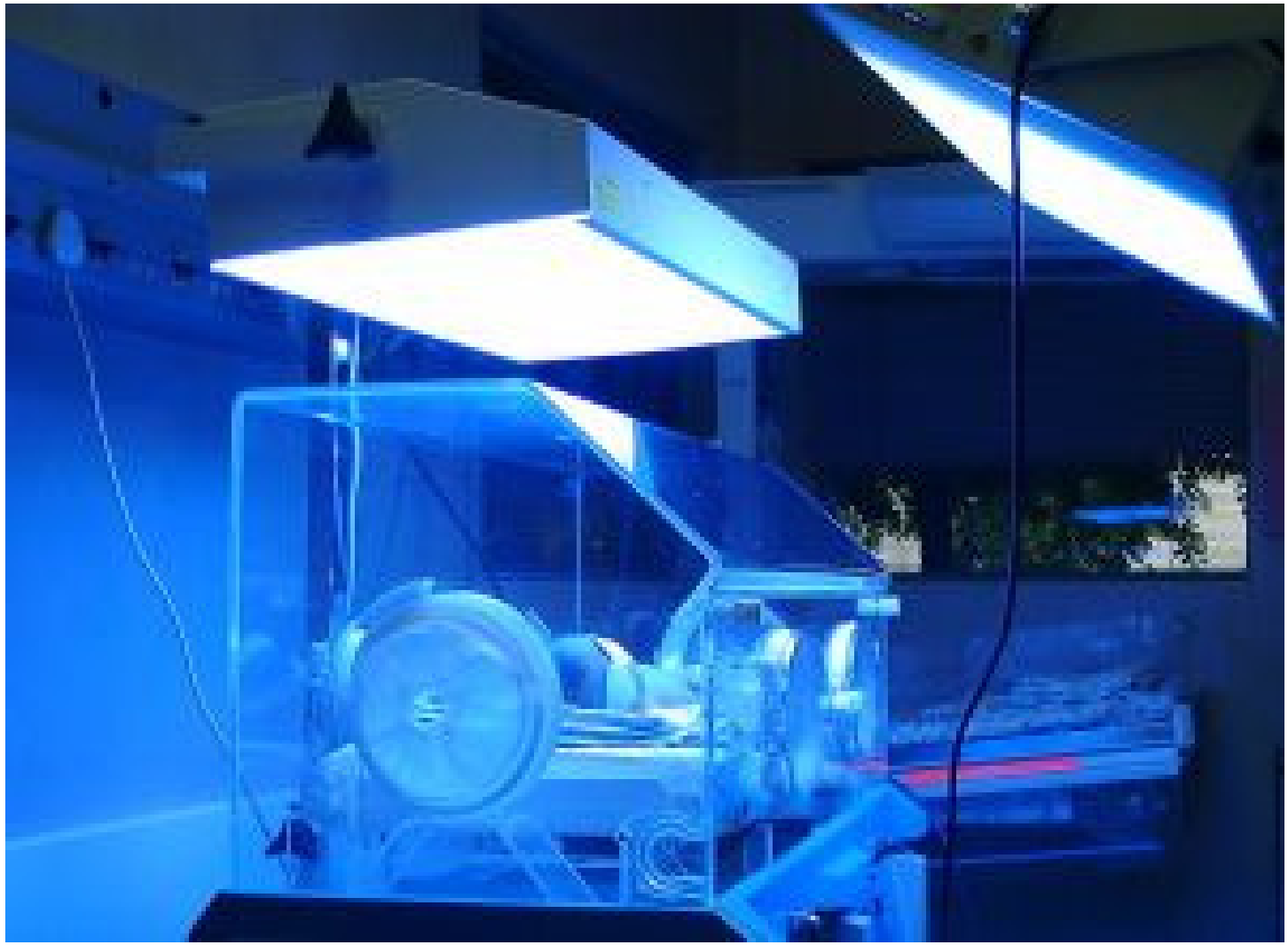

Nursing care of the infant receiving phototherapy

- Nurse fully exposed
- Assessment of fluid requirements
- Skin Care – NO creams or oils
- Observation
- Nurse in isolette or cot
- Eye pad / cover eyes to protect retina
- Check temperature (may overheat under conventional lights but also may cool down due to exposure)
- Comfort and calming measures
- Parental support, Explanation and reassurance

Exchange Transfusion

- Use when double and / or triple phototherapy is not effective
- Above threshold for exchange
- For pathological Jaundice

Further Reading

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