# How can the efficacy of phototherapy treatment for Physiological Neonatal Hyperbilirubinaemia (PNH) be increased?

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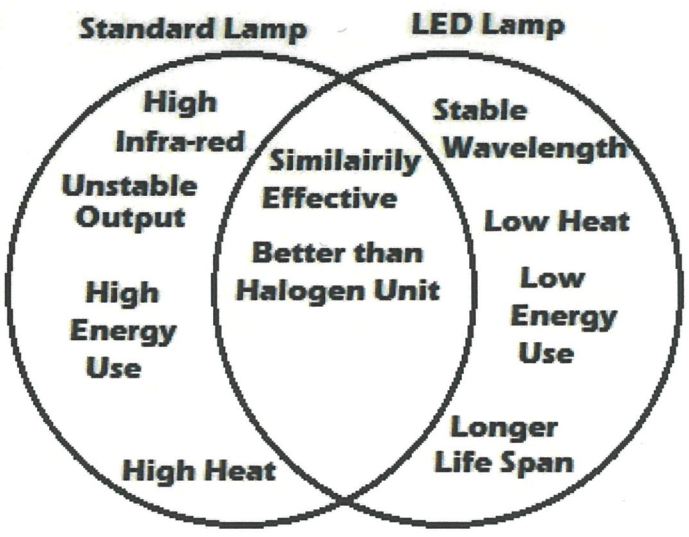
**Physiological Neonatal Hyperbilirubinaemia** (PNH) is also known as indirect, uncomplicated or non-pathological neonatal jaundice. PNH develops at around the third day of life and it is an elevation in serum bilirubin levels due to the increased breakdown of foetal haemoglobin (6). Because neonates have a limited ability to excrete bilirubin these levels can become toxic. Though most cases of PNH are benign it is important to identify the neonates at higher risk. Such as the preterm infant (1). Early identification and treatment is important to avoid the development of potential complications. A potential barrier to effective treatment is the disparities between treatment guidelines (4).

**Phototherapy** is the use of light within a specific wavelength to breakdown the bilirubin in the infants skin and superficial capillaries (4). Though treatment of PHN depends on the severity of hyperbilirubinaemia phototherapy is usually the first treatment (2). Despite its widespread use experts are still researching into the most effective way to administer phototherapy (3).




**Lamp:** The development of the most effective Phototherapy unit is still undergoing. The standard fluorescent lamp is the most common unit and is better than the older halogen phototherapy lamps (5). Studies done in India and Iran comparing the fluorescent lamp and the LED have found that the LED phototherapy unit is a better option (5). This conclusion was based on LED lamps being more cost effective and their usage being related to a lower incidence in unwanted side effects.

(Babaei, Alipour, Hemmati, Ghaderi, &Rezaei, 2013)

**Reflective Cover:** A study in Iran found that by covering the Phototherapy unit on three sides with a reflective white plastic sheet they could significantly decrease treatment time (3). Using a reflective cover increases the irradiance of the light source and the skin surface area exposed (3). The use of a cover is thought to also decrease parent fear and anxiety (6). One potential hazard is the increase in unwanted side effects.

**Concurrent use of Pharmaceuticals:**

The use of pharmacological products to augment phototherapy is a potential way to improve the efficacy of treatment (1). Before this becomes standard practice, however, the long term safety of these drugs needs testing. One such drug is Clofibrate. Clofibrate is used to control high cholesterol levels (2). When used in neonates alongside phototherapy it assists in lowering serum bilirubin levels. There is no doubt that Clofibrate is an effective drug, but further study needs to be done to establish the safety of its use in neonates (2). Clofibrate is not used within New Zealand for this purpose.

## Implications for Practice:

**A standard National or International guideline for the treatment of PNH based on current best practice. This will increase the efficacy of treatment.**

**Use of LED lamps instead of Fluorescent lamps. Though this will not decrease the length of treatment it will decrease the incidence of unwanted side effects such as hyperthermia and dehydration due to insensible transdermal water loss.**

**The use of a reflective cover such as a white plastic sheet over three sides of treatment unit. This increases the effectiveness of treatment by increasing the irradiance of the lamp which in turn hastens the decrease of serum bilirubin levels. This could mean that fewer neonates will need more complex interventions.**

**Further research into the safety of drugs such as Clofibrate. The potential use of such drugs in the future could decrease length of treatment and need for more complex interventions.**

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