

Home-based phototherapy with the BiliSoft™ 2.0 Phototherapy System

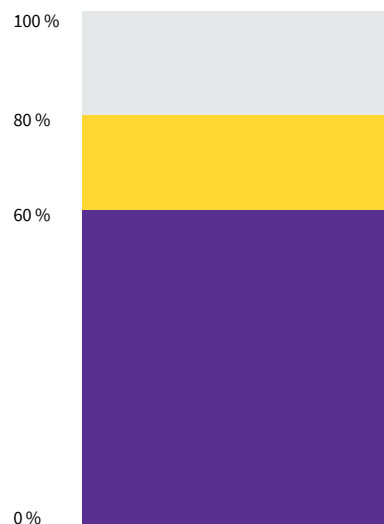
Considerations and advantages for treating newborn jaundice

Jaundice, also known as hyperbilirubinemia, is a medical condition that occurs when there is too much bilirubin in the blood. Bilirubin is created during the breakdown of red blood cells and haemoglobin, and is normally excreted from the body through urine and stool. Neonatal jaundice usually presents after 24 hours postpartum, and peaks at around 48-96 hours of life, causing yellowing of the skin or eyes. The condition occurs in 60-80 percent of term and late-preterm infants, and constitutes the most common reason for infant hospital readmission in the first weeks of life.¹ Severe hyperbilirubinemia can result in serious medical conditions such as encephalopathy (kernicterus) if left untreated.

This white paper describes how home-based phototherapy can be used to effectively treat jaundice in newborns and prevent the development of severe hyperbilirubinemia through timely intervention. It also highlights the key benefits of home phototherapy to both families and healthcare systems, and presents a best practice case study from the UK.



BiliSoft™ 2.0



Jaundice affects 60-80 % of late pre-term and term infants.

What is phototherapy?

Most cases of jaundice in newborns are mild and start to improve on their own after a few days once the baby's liver begins to effectively breakdown bilirubin. However, some infants require phototherapy to help to keep blood bilirubin levels within normal parameters until this happens. Phototherapy uses light in the blue-green part of the white light spectrum to break down excess bilirubin that lies close to the skin's surface, so that it can then be excreted from the body. It is the most common form of treatment for jaundice, and is usually administered in a hospital setting via a static overhead lamp over the child lying in a bassinet or incubator. Ideally, to be fully effective, phototherapy must be administered around the clock over the course of several days to attain maximum exposure, meaning that family members have little physical contact with their child in the crucial first days of life, causing emotional stress and preventing natural bonding. The baby can also be rendered uncomfortable by the bassinet, and its sleep and feeding patterns may be disturbed by the constant light and noise of the hospital environment.

Jaundice can be noticeable soon after birth or can develop a little later, when it is frequently picked up by health visitors or community midwives on their routine home visits at two days postpartum. The infant is then typically sent to the emergency department for blood tests, and potentially admitted into hospital for phototherapy. This causes severe anxiety and inconvenience for parents, and also incurs additional travel, food, parking and childcare costs, which can place a significant financial burden on families, particularly those with lower incomes.

The benefits of home phototherapy

A welcome alternative is a portable phototherapy device that now enables highly effective treatment to be carried out at home, preventing the separation of mothers and their infants, and allowing uninterrupted bonding and breastfeeding. Being able to treat jaundice at home enables shorter hospital stays and reduces newborn readmissions due to post-discharge diagnosis or relapse. This increases bed availability for incoming patients and relieves pressure on strained emergency departments, improving patient flow and experience. Home treatment like this is additionally far more cost effective than phototherapy carried out in a hospital setting; it avoids extra costs associated with hospital admissions – staff time, bed space, maintenance expenses and utilities¹ – and has numerous benefits for the healthcare system as a whole.

The BiliSoft™ 2.0 Phototherapy System

The BiliSoft 2.0 device from GE HealthCare is a revolution in the effective treatment of hyperbilirubinemia. Its blue LED light delivers healing phototherapy via a lightweight fibreoptic cable and soft pad, and exceeds the recommendations of the American Academy of Pediatrics.² Unlike static lamps, the pad wraps around the baby, covering a greater skin area for more effective treatment. The close proximity of the light source to the baby also means that the treatment intensity is not diminished by distance, and the pad has 60 percent light uniformity. The ultra-soft, disposable BiliSoft 2.0 covers and nests are made of flame-retardant, skin-friendly fabric, and have soft straps to help swaddle a baby in comfort while the light is transmitted. BiliSoft 2.0 removes any barrier to bonding between

an infant and caregivers as it is easy to set up and use at home with minimal training and supervision, and it enables the baby to be held, fed and rocked as normal throughout therapy. Its quiet operation also helps to maintain a peaceful environment that promotes sleep and growth, making it ideal for in-home application.

BiliSoft 2.0 key facts

Healing blue LED light

Soft pad wraps around baby for greater light exposure

No distance factor to diminish light intensity

60 % light uniformity

Quiet operation

Uninterrupted treatment

No barrier to bonding



Intensive therapy, as easy as wrapping a baby in a blanket.

Children's Hospital at Home Service, UK

The NHS Children's Hospital at Home service was established in London in 2014, and now has 50 participating teams across England and Wales. The initiative provides home-based hospital care to children with acute conditions such as asthma, bronchiolitis, infections and physiological jaundice. Teams comprise nurses, midwives, paediatricians and specialist consultants, with families being visited at home several times a day between 8 am and 10 pm, depending on the severity and nature of the child's illness.

Streamlining referrals for timely treatment

Hospital at Home employs strict criteria to assess which newborns experiencing jaundice are eligible for home phototherapy, for instance, the child must be over 37 weeks of gestation, and between one and 14 days old. Infants also undergo a risk assessment, incorporating birth weight, percentage weight loss and feeding success. Phototherapy may be initiated at the hospital upon review by a neonatal consultant, and the infant must already be responding well to treatment before being referred to the Hospital at Home service. Alternatively, community midwives and health visitors may notice a yellowing of the skin during a routine home visit within 48 hours of hospital discharge, indicating possible jaundice. The healthcare worker then uses a handheld transcutaneous bilirubinometer to determine whether the baby's serum bilirubin (SBR) level is high enough to warrant phototherapy. They can call the Hospital at Home team directly while still with the patient, and perform an assessment over the phone to decide whether the infant meets the service's eligibility criteria. A direct referral avoids hospital visits altogether.

Supporting parents every step of the way

The service uses the BiliSoft 2.0 phototherapy system to treat newborns with jaundice in the home, with therapy typically lasting one to five days. BiliSoft 2.0 is equally as effective at delivering phototherapy as the overhead lights used in hospitals, and results in a readmission rate of less than one percent. Under continuous use and at room temperature, each device provides over 50,000 hours of light therapy during its normal working lifespan. This means that one unit is capable of treating up to 690 children for 72 hours each. Upon referral, nurses visit families eligible for home-based therapy – either on the ward or in their homes – to teach them how to use the BiliSoft 2.0 device and provide necessary storage and safety advice. The health worker then visits the patient at home several times a day during the course of treatment to make sure that parents are confident using the device and to provide feeding support. The nurse or midwife will also monitor SBR with heel prick blood tests in line with NICE guidelines.³ Blood is checked twice again, shortly after cessation of treatment, to ensure the SBR level has not bounced back up again above the threshold for phototherapy.



Case study

A holistic approach to care

The Hospital at Home service has observed that providing phototherapy at home with BiliSoft 2.0 allows families to look after other children in the household, and experience normal bonding and family life. It also supports more regular eating and sleeping schedules for parents and babies alike, and helps to alleviate anxiety, promoting better parental mental health. In addition, home care avoids the extra financial costs that would be incurred by long hospital stays and repeated visits, including parking, food and childcare for other children in the family. Nurses and midwives are also on hand via video and phone, providing parents with added assurance and support. As a result, the service has seen 100 percent user satisfaction, with parents stating they are confident using the BiliSoft 2.0 equipment, and appreciate being able to recuperate in the comfort of their own home without missing out on early bonding opportunities.

Strengthening the healthcare system

The Hospital at Home phototherapy service prevents a vast majority of admissions due to newborn jaundice, improving patient flow and freeing up beds in neonatal units, children's wards and emergency departments for those requiring urgent or round-the-clock medical care. The average cost of a general paediatric bed in the UK is around £450 per day, with NICU beds amounting to more due to the additional resources and hands-on staff time needed.* In contrast, estimates suggest that it costs approximately £225 a day for a nurse to attend a child with any acute illness through the Hospital at Home service.* Other studies conducted within the NHS also suggest that the cost of home phototherapy with the BiliSoft 2.0 is approximately £350 less per baby than traditional hospital treatment.⁴ Avoiding readmissions and shortening hospital stays through home treatment could therefore enable the NHS to significantly reduce its paediatric and neonatal expenses, and these financial resources can be reinvested into the healthcare system to further improve patient care.



Key facts

<1 % readmission rate

>50,000 hours of continuous light therapy per unit

690 children treated per unit

100 % user satisfaction among parents

Improves patient flow and frees up beds

£350 cost saving per baby⁴

Summary

A holistic approach to care

The UK's Hospital at Home service illustrates a best practice case study for treating jaundiced neonates at home, and demonstrates an approach that is rapidly gaining attention as a way to provide acutely unwell children with hospital-quality care in the community. Home-based phototherapy has proven highly effective at quickly remediating newborn jaundice while avoiding separation of mothers and their infants. This supports bonding and breastfeeding, and relieves the stress and financial pressures associated with extended hospital stays and frequent hospital visits. Midwife-led, paediatrician-supervised home jaundice treatment using devices such as the BiliSoft 2.0 can also be extremely cost effective for healthcare systems by shortening the length of hospital stays and avoiding unnecessary emergency department visits and readmissions. Referring infants with jaundice to a home-based phototherapy program also frees up beds for incoming patients, improving patient flow and reducing strain on busy paediatric and emergency services.

References

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3. National Institute for Health and Care Excellence. Jaundice in newborn babies under 28 days. Clinical Guidance [CG98].
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* Data provided by Zoe Tribble, Senior Nurse for Integrated Paediatrics. Individual outcomes may vary, and the results shown here are unique to this particular customer's experience. The achieved outcomes are influenced by various factors that are specific to each customer. GE HealthCare cannot guarantee the replication of these results or similar outcomes for every customer.

This whitepaper is based on the BiliSoft 2.0 Phototherapy System use in UK. Not all features shown are available in all countries, please check with your local sales representatives.



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