

neoBLUE® LED Phototherapy

HOSPITAL INSERVICE

neoBLUE® LED PHOTOTHERAPY OVERVIEW

Natus' neoBLUE LED Phototherapy System is a floor-standing, mobile phototherapy device that delivers a narrow band of high-intensity blue light via blue light emitting diodes (LEDs) to provide treatment for neonatal hyperbilirubinemia in the hospital setting. Blue LEDs emit light in the range of 400 – 500 nm (peak wavelength 450 - 470 nm). This range corresponds to the spectral absorption of light by bilirubin, and is thus considered to be the most effective for the degradation of bilirubin. Blue LEDs do not emit significant ultraviolet (UV) or infrared (IR) radiation, so they can be placed close to the baby.



STEPS FOR USING THE neoBLUE LIGHT ON A PATIENT

1. Per hospital protocol or at least every 6 months, check light intensity. LEDs have very gradual degradation of intensity over time. A typical LED panel will provide over 4,000 hours of intensity above 30 $\mu\text{W}/\text{cm}^2/\text{nm}^*$ with a total of 10,000 hours of life (intensity above 12 $\mu\text{W}/\text{cm}^2/\text{nm}^*$). When intensity drops below the desired level, biomedical engineering can adjust it via the potentiometer on the side of the enclosure. (Refer to service manual)

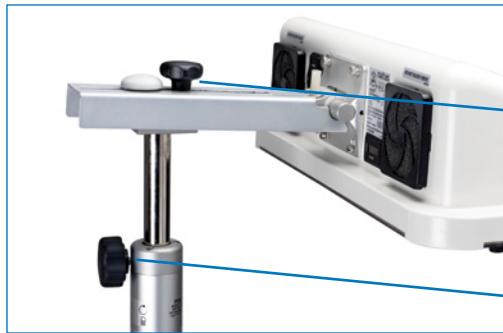
*As measured by a neoBLUE® Radiometer at 12 inches (30.5 cm) from the baby.

2. Shield infant's eyes with appropriate protective eye shields.



Biliband® Eye Protectors
 Sizes: *Micro (P/N 900644)*
Premature (P/N 900643)
Regular (P/N 900642)

3. Position light over infant. The light can be tilted and adjusted both horizontally and vertically on the roll stand assembly. The light enclosure can be tilted to approximately 40° up from horizontal (the resting position). The light enclosure can be tilted by grasping the device on either side and adjusting to desired angle.



Proximity adjustment

Height adjustment

Tilting the light enclosure



When adjusting the proximity, hold up the neoBLUE light enclosure with one hand to lessen the weight on the rail.

4. Note hour count on timer. If you track patient treatment time, note the number of hours at the beginning of treatment, and again at the end of treatment.

5. Turn on power switch on front of light enclosure. This is the green switch in the center of the front panel.

Timer



Vents — Do Not Block

Power Cord Attachment

6. Press Target Illumination Switch to center light over infant. Confirm placement of the light to cover maximum surface area of the baby for best results. The target light is red and should be centered over the baby's torso.

7. Per physician order, select High or Low intensity at Irradiance Level Control Switch. Depending on your hospital protocol, high may correspond with "double" or "triple" phototherapy. Low typically corresponds to "single" phototherapy.



Front panel switches for neoBLUE light enclosure

Intensity Measurements

The neoBLUE light is calibrated at the factory with the neoBLUE® Radiometer to yield the following intensities at 12 inches (30.5 cm) from the baby:

- High intensity: 30-35 $\mu\text{W}/\text{cm}^2/\text{nm}$
- Low intensity: 12-15 $\mu\text{W}/\text{cm}^2/\text{nm}$

Different radiometers will yield different measurements. Some radiometers are calibrated to broad band light sources (e.g., white light) and will not register high intensity with a narrow band blue light. Refer to the chart below for more information on what your radiometer may read if you are not using a neoBLUE® Radiometer.

Radiometer Intensity ($\mu\text{W}/\text{cm}^2/\text{nm}$):	neoBLUE® Radiometer	Ohmeda BiliBlanket® Meter II	Olympic Bili-Meter™
neoBLUE overhead light <i>measured at 12 inches / 30.5 cm distance</i>	35	35	22.7

NOTE: Vents are located on the underside of the enclosure. **Do not block vents** when using drapes or other light shielding methods.



[Continued On Reverse Side]

Intensity is inversely related to distance from the infant. As the neoBLUE light does not emit significant UV or IR, it can be placed as close to the infant as desired to yield high intensity levels. Likewise, biomedical engineering can adjust the intensity as noted in the service manual.

When placing the light at an angle, you may be increasing the distance between the light and the baby, thereby decreasing the intensity. In most cases, the intensity will still be in the effective range. However, biomedical engineering can adjust the intensity as noted above.

Distance, cm (inches)	Intensity ($\mu\text{W}/\text{cm}^2/\text{nm}$)	
	Low	High
6 in (15 cm)	24	54
12 in (30.5 cm)	15	35
18 in (45 cm)	9	20
24 in (60 cm)	5	12

Use with an Incubator

The neoBLUE light can be placed on top of an incubator with or without the rollstand. The rubber feet on the bottom of the enclosure add stability and room for air flow.



neoBLUE device with incubator

Use only a light drape designed specifically for the neoBLUE light.



neoBLUE device with light drape (P/N 001241)

Important! Though the neoBLUE device does not radiate significant heat, it is an electrical device and can affect the temperature within a closed environment. Use of patient servo mode is indicated to control the baby's temperature during use. If manual mode is prescribed, the baby's temperature must be monitored.

The neoBLUE light can also be tilted on the side of the incubator. Care should be taken to protect caregivers from any glare by angling the light towards the back of the room or by using a drape.

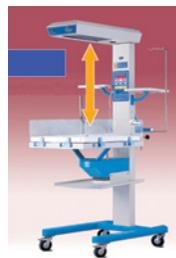
Use with a Radiant Warmer

When used with a radiant warmer, care must be taken to angle the light and position it to the side of the heat source. The enclosure must be placed no further than 12 inches (30.5 cm) from the baby and out of the path of the radiant heat source.

Note: The neoBLUE drape is not indicated for use in conjunction with a radiant warmer.



neoBLUE light enclosure tilted at an angle



Correct: neoBLUE light positioned to the side of radiant heat source.



Incorrect: neoBLUE light blocks radiant heat source.

Use with a Bassinet

The neoBLUE light can be used to treat babies in bassinets. Keep the light as close to the baby as possible to reduce convective heat loss caused by traffic in the nursery. The neoBLUE light drape can also be used to reduce draft and lessen the light to caregivers.



neoBLUE device with bassinet

FREQUENTLY ASKED QUESTIONS

- **How often should I check the intensity?** LEDs can last for thousands of hours at high intensity. Natus recommends checking intensity at least every 6 months. When the intensity drops below the desired level, biomedical engineering should be called to trim the potentiometer as noted in the service manual.
Checking the light intensity before each use is recommended where feasible to confirm correct positioning of the light over the infant.
- **How often do we need to change the bulb?** The LED panel will show slight degradation over time. After biomedical engineering adjusts the potentiometer to its maximum output, you will still have thousands of hours of use left. The panel will not shut off at any time. The intensity will gradually decrease so the hospital has time to decide when to replace the panel.
- **Should we turn off the light when we take a blood sample or assess the infant?** You may choose to turn off the device while providing direct infant care or assessment. The amount of time the blood will be exposed to the light is minimal but assessment will be easier under natural lighting.
- **What should we do if caregivers do not tolerate blue light well?** A small percentage of the population has sensitivity to blue light. Do not gaze into the LEDs. Use the neoBLUE light in a well-lighted area, angle the light away from ancillary work areas, and/or use amber glasses or draping where necessary. The neoBLUE light drape is available from Natus. Guard Dog Bones glasses (P/N 413BB) are recommended and are available online at www.safetyglasses.com or via phone at 1-800-870-6189.
- **How far should the neoBLUE light be placed from the baby?** The light is calibrated to deliver the stated intensity at a distance of 12 inches (30.5 cm) from the baby. You can place the neoBLUE light closer as it does not emit significant UV or IR. If you place it farther from the baby, you may need to trim the potentiometer to maintain high intensity. In general, for every foot you move away from the baby, you halve the intensity.
- **What is the red target light used for?** To assess where the middle of the light is for proper placement.

ADDITIONAL NOTES

- **To avoid overheating, do not cover vents.** Clean filters once per month (see user manual).
- **Do not** place directly under radiant heat source.
- If you have additional questions, please refer to your user manual.
- For service information, please refer to your service manual.

BiliBlanket is a registered trademark of Ohmeda Medical.
Bili-Meter is a trademark of Olympic Medical.

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