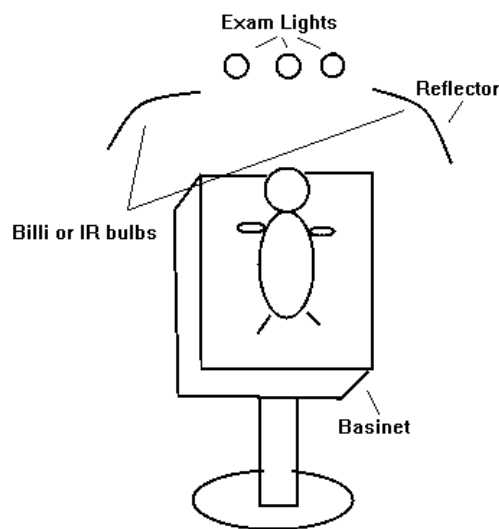


2.12 Phototherapy lights

2.12.1 Clinical Use and Principles of Operation

The buildup of bilirubin in an infant's blood, caused by decreased liver functions, can cause long term damage to the child. Bilirubin buildup causes the patients' coloring to range from yellow to orange to red depending upon the level of bilirubin in the system. By exposing the patient to light with wavelengths between 425 and 475 nm, the bilirubin is broken down, and then eventually excreted from the body.

The phototherapy unit, or bili-lights, as they are more commonly called, is simply a strong source of light in the correct wavelength. The baby sits in a basinet below the lights for 20 minutes or more, depending on what the physician prescribes (see figure). The light is strong enough that it can damage the retina. So, the patients' eyes must be protected from the light when using the bili-light.



Phototherapy lights are common in the developing world. However, the bulbs are often broken or ineffective. Exam lights are often included as well as heating (IR) lamps.

2.12.2 Common Problems

The most common problem is a broken or missing light bulb. There is little else that can go wrong. There are many substitute light sources. The use of Florissant brand tubes or Daylight blue bulbs is quite common. The "Gro-Lux" light, also used by indoor gardeners was the most common form of treatment. Unfortunately the Gro-Lux tubes degrade and have to be replaced after about 200 hours of use to keep the light in the proper wavelength range. The same light spectrum is used in a PUMA unit to treat certain skin disorders in adults. The light bulbs in tanning beds are also in the correct wavelength range.

2.12.3 Suggested Minimal Testing

If the light turns on and is still in the correct wavelength range, then the unit can be used. To verify that the light is in the correct range, you need a light meter and a filter. A photographer's light meter can be used if the proper filter is at hand. If you have time, you can check the light source by leaving your arm exposed to the light for 30 minutes. The next day, that part of your skin should be tan, but not burned.

If you have replaced the light bulb, or have built a phototherapy unit from light bulbs that you purchased (gro-lux or tanning bed lights, for example), then you must be sure that the lights are not too intense for the patient. Again the ideal test is a light meter and a proper filter. However, you can use the arm-tanning test mentioned above. Start with 5 minutes to be sure that you do not get burned. Test longer and longer intervals until you can withstand 30 minutes without burning, but receiving a significant tan. Explain your testing to the staff so that they know that it is safe for up to 30 minutes, but that you haven't tested it for longer exposures.

If the light is working and you have a meter, you can also check that the intensity is consistent over the entire surface of the patient.