

April 2008

Shining a Light on Infant Jaundice Challenge Introduction

For centuries, physicians have known of the healing power of light. In recent years, new light sources such as lasers and light emitting diodes have been harnessed to provide phototherapy treatment for diseases ranging from psoriasis to seasonal affective disorder. *Photodynamic* therapy also uses light, for example, to shrink tumors. In this light enabled therapy, the source is often a laser and the tumor is first treated with photosensitive drugs. Light of the correct wavelength then activates the drug, producing molecules that are toxic to cancer cells, causing the tumor to shrink.

One form of phototherapy was discovered by accident when a doctor working in a newborn nursery noticed that babies placed near the windows recovered from newborn jaundice sooner than those placed near the center of the room. About half of newborn infants develop jaundice because their immature systems are unable to clear bilirubin, an orange-yellowish chemical that results from the breakdown of the hemoglobin in red blood cells. Since the 1950s, babies with severe jaundice have been treated by exposing them to different types of light. But what is the best type of light to use? Can modern technology improve upon sunlight therapy by providing a safe and cost effective alternative?