

Infant Radiant Warmers

Radiant warmers are frequently used in delivery rooms and neonatal care units when open access and external heat are simultaneously required.¹ The sale of more than 13,000 units by U.S. manufacturers during the past ten years attests to the acceptance of these devices by pediatricians.² However, some concern about the use of the warmers stems from potential hazards and the lack of information regarding possible effects of the devices. This concern was recently expressed by a panel of consultants to the Bureau of Medical Devices in the Food and Drug Administration (FDA) who recommended that the FDA obtain additional information to assist it in evaluating radiation warmer safety.³ If this recommendation is accepted by the FDA, current procedures require that additional information regarding the effects of radiant warmers on infants must be provided within a period of 30 months.⁴ Therefore, pediatricians should be aware of the issues involved.

The most serious complication of radiant warmers is extreme hyperthermia, which may occur from improper use or from dislodgement of the sensor probe. Hyperthermia may result in death or permanent neurological damage (T. Peebles, personal communication). Insensible water loss increases markedly when infants are placed in the warm, dry, open environment under radiant warmers, and may increase by 50% to 200% over that observed among infants in incubators, depending on the maturity of the infant and the type of warmer.⁵ First-degree burns have been attributed to radiant warmer heating of plastic-lined disposable diapers which were placed next to the skin for urine collection.⁶ Finally, interference with the temperature control circuit of a radiant warmer was reported as a result of radio frequency energy emitted by a hospital paging system.⁷

Other potential delayed effects from exposure of newborn infants to infrared radiation are suggested by experimental data and observations on human adults, e.g., cataracts and corneal opacities.^{8,9} Emissions from some radiant warmers at their maximum intensity are of the same order of magnitude as the maximum level recommended in guidelines for occupational exposure to infrared radiation and the exposures associated with lens opacities in glass and steel workers.^{9,10} Transmission of energy at wavelengths less than 1,400 nm through the lens and cornea can produce retinal lesions.^{8,9} Evaluation of the risk to the infant's retina requires measurements of near infrared emissions that are not now available for most radiant warmers, and, more important, requires further investigation of thresholds for retinal injury. Neither cataracts nor retinal lesions have been reported in infants from radiant warmers, but these possible sequelae have not been systematically sought. Near infrared energy can readily penetrate the scalp and skull of small premature infants.¹¹ The relevance of these observations to the use of radiant warmers for newborn infants is as yet unknown. Immaturity and other interacting factors unique to the newborn infant could predispose to injury from infrared radiation. Consequently, some concern about safety seems justified.

When purchasing and using radiant warmers several precautions should be taken. Special attention should be given to the adequacy of the safety mechanisms. Radiant warmers should be employed only when there is a simultaneous need for open access and supplemental heat. Infants under these warmers should be closely monitored, and their temperatures checked frequently. Careful monitoring of fluid balance and appropriate adjustments of fluid intake should be made to compensate for increased insensible water loss.

Shielding the eyes from direct infrared exposure will eliminate the possible risk of ocular damage. The use of masks, as with phototherapy, may have complications^{12,13} unless eye shields are developed that are remote from the infant.

Until more information is available regarding the effects, if any, of infrared irradiation on infants, radiant warmers should be used with caution and with consideration as to whether the benefits justify potential risks.

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Consultant: J. Julian Chisolm, Jr., M.D.

Liaison Members: J. William Flynt, M.D.; Peter C. Scheidt, M.D.

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RICHARD HAZELTINE DESCRIBED KOPLIK SPOTS BEFORE KOPLIK'S REPORT

Henry Koplik (1858-1927), an American pediatrician, is usually said to be the first to have noted and reported on Koplik spots, the buccal spots which are an important early diagnostic sign of measles (*Arch Pediatr* 13:918, 1896). However, nearly a century before Koplik described the spots which bear his name, Dr. Richard Hazeltine, a general practitioner in Berwick (Daughty's Falls) Maine, described these spots as follows:

I notice no phenomenon which I could call a precursor of the disease, except the early appearance of the eruption in the internal fauces might be called one. In almost every instance where the commencement of the disease came to my knowledge, this appearance was to be observed at least 36, and in some cases 48 hours before the eruption appeared externally. I suspect the coryza, raucedo [hoarseness] and tussis, which generally precede the cuticular eruption, and which constitute so important a trait in the diagnosis of the disease, are wholly attributable to this early eruption on the mucous membrane of the internal fauces, larynx, trachea, etc. I was informed by some persons, that they had pretty constantly observed a pale miliary eruption on the gums two to three days previous to the cuticular eruption; and I think I saw a case or two of this kind myself.

Noted by T.E.C., Jr., M.D.

From Hazeltine R: An account of the measles, at it appeared in Berwick, County of York, District of Maine, during a part of the years 1802 and 1803. *Med Repository (NY)* 2nd Hex 1:344, 1804.

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Committee on Environmental Hazards
Pediatrics 1978;61;113

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