

Laser medical surveillance

A program for operating room nurses working with lasers

By Mary Knight Kubasiewicz, R.N., M.N.

In the spring of 1990, the Riverside Hospital of Ottawa acquired a carbon dioxide (CO₂) laser for use in the operating room. The facility is a 274-bed active treatment community hospital, and the purchase marked this hospital's maiden voyage into laser surgery.

As nurses operating the laser became aware of issues related to the safe use of lasers, it was decided to develop a policy which would outline a medical surveillance program for hospital personnel involved in the care of patients undergoing laser surgery. Because Canadian standards on the safe use of lasers are currently in the final stages of development by the Canadian Standards Association, the following American resources were used:

- American National Standards for the Safe Use of Lasers (ANSI Z136.1 - 1986);
- American Standard for the Safe Use of Lasers in Health Care Facilities (ANSI Z136.3 - 1988); and,
- Recommended Practices: Laser Safety in the Practice Setting (A.O.R.N., 1989).

Generally speaking, the focus of medical surveillance programs is to assess exposure to a specific agent or hazard. With CO₂ lasers, the potential hazards for operating room personnel are eye and skin exposure. There are three purposes for conducting a surveillance program:

Purposes of a surveillance program

1. To establish a baseline against which ocular damage can be measured in the event of accidental injury.
2. To supply a baseline level of ocular performance at initiation and termination of employment.
3. To identify personnel with a risk of photosensitivity, as the cumulative effects of laser radiation are not known at this time.

(ANSI 1986 & 1988)

Literature review

(See references - page 13)

To round out the prospective provided by the above resources, a literature review was done. In 1977, an American study was reported which examined the results of over 800 medical surveillance ocular examinations on microwave and laser workers (Hathaway et al, 1977). The study found no evidence of effects that could be attributed to work with

either laser or microwave radiation. It was concluded that periodic medical surveillance should be limited to pre-assignment, post-accident exposure and employee-termination eye examinations.

A British study found that safety measures adopted in laser laboratories have led to a degree of containment and control (of the laser) which makes the routine ophthalmological surveillance of laser workers unnecessary (Friedmann, 1978).

However, the author points out that from the medico-legal point of view, there may be some advantage in requiring all new recruits to laser work to have a pre-employment ophthalmological exam.

More recently, Wolbarsht and Landers (1985) suggest that surveillance done before exposure to specific ocular hazards may be best accomplished with a battery of tests of specific visual functions. They also indicate that the major medical and legal consideration is the detection of retinal changes which cause disturbances of visual functions.

An article by Hildebrand (1990) outlines a sample program for medical surveillance of health care personnel using lasers in surgery. Ball (1990) recommends following the ANSI Standards (ANSI, 1986 & 1988), and also provides a sample policy and procedure for implementation. The reasons for an ocular surveillance program, as well as the realities of implementation are discussed in a recent article ("Baseline Eye Exams," 1990).

Policy and procedure

On the following page, the box represents the final draft of the policy and procedure developed at the Riverside Hospital of Ottawa. The policy was developed utilizing the American standards and Ball's example (1990). At the present time, initial eye examinations are being arranged with an ophthalmologist at the Riverside Hospital facility. ■

References

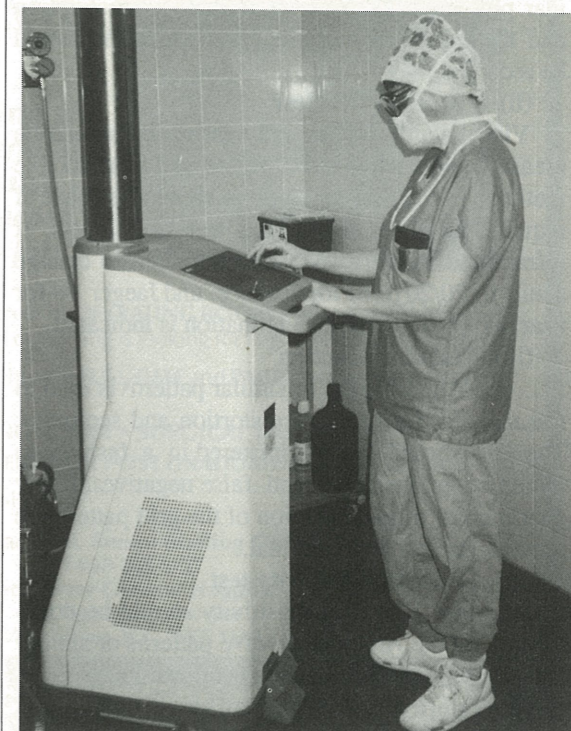
- American National Standards Institute, Inc. (ANSI, 1986). American National Standard for the Safe Use of Lasers. (ANSI - Z136.1), Toledo, Ohio: The Laser Institute of America.
- American National Standards Institute, Inc. (ANSI, 1988). American National Standard for the Safe Use of Lasers in Health Care Facilities. (ANSI - Z136.3), Toledo, OH: The Laser Institute of America.
- Association of Operating Room Nurses (AORN),

1989. Recommended Practices: Laser Safety in the Practice Setting. *AORN Journal*, 50(5), 1015-1020.

- Ball, K., (1990). Lasers - The Perioperative Challenge. Toronto, C.V. Mosby-Yearbook Co.
- Baseline eye exams useful if you can afford the expense. Oct., 1990. *Clinical Laser Monthly*, 8(10).
- Friedmann, A. (1978). The ophthalmic screening of laser workers. *Ann. Occupa. Hygiene*, 21, 277-279.
- Hathaway, J.A., Stern, N., Soles, E.M., & Leighton, E. (1977). Ocular medical surveillance on microwave and laser workers. *Journal of Occupational Medicine*, 19(10), 683-688.
- Hildebrand, M. (1990). Sample procedures for medical surveillance of health care personnel using lasers in surgery. *Laser Nursing*, 4(1), 14-16.
- Wolbarsht, M.L., & Landers, M.B. (1985). Testing visual capabilities for medical surveillance or to ensure job fitness. *Journal of Occupational Medicine*, 27(12), 897-901.

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Mary Knight Kubasiewicz graduated from Grace General Hospital in Winnipeg. She received her B.Sc.N. from the University of Alberta and M.N. from the University of Manitoba. This article was written while she was a Nurse Clinician, OR, Riverside General Hospital of Ottawa.



A laser nurse at Riverside General Hospital of Ottawa operates the laser delivery console during a procedure.