Following the guidelines eliminate the risks involved in laser surgery

Last Fall, an international congress on the applications of laser and electro-optics was held in Santa Monica, California. During this congress, one of the sessions discussed various aspects of the potential for harm from the debris and by-products produced during laser surgery. The session was organized through the efforts of the Laser Institute of America and the United States Food and Drug Administration.

One of the four speakers and panelists invited to speak on the subject was laser surgeon, Dr. Alex Ferenczy of the Sir. Mortimer B. Davis Jewish General Hospital in Montreal, Quebec.

Dr. Ferenczy reported on tests he had carried out using a DNA/RNA kit for detecting papilloma virus (epithelian tumors of the skin or mucous membrane, i.e., warts, condylomas, and polyps).

One positive result

He tested the smoke evacuator tube and the pre-filter of his plume evacuation system. He reported that of 65 patients with condyloma warts known to be positive for the human papilloma virus, only one positive result was found when testing the contents of the smoke evacuator or pre-filter.

In addition, using the same testing measures, samples taken from his own nose, ears and face after he had performed numerous laser surgeries have never been found positive.

Dr. Ferenczy mentioned that he had previously tested the skin area surrounding the laser surgery and on many occasions had obtained positive test results for virus presence.

Thermal killing area

However, when the area of thermal treatment was extended a few millimeters, the positive test results for the virus were eliminated. Dr. Ferenczy believes that the incidence of wart recurrence has also decreased markedly with the use of this enlarged area of thermal damage. He further believes that the failure to have positive findings results from the thermal killing of any virus by the CO_2 laser. This effect (extending the thermal area) also appears to kill any virus present outside the actual surgical site, thus reducing the recurrence rate of warts in his patients.

Other sources of debris

Recapping the results of other tests reported as well as comments from other surgeons on the panel, it was concluded that lasers are not the only source of debris/smoke in the surgical suite. Other instruments which spin, sputter or whine (surgical saws, bone drills, skin abrasion instruments and electrocautery devices) also generate plume or debris.

Since these devices are used, as is the laser, in the presence of blood or to treat lesions which contain viable particles, these also are potential sources for the transmission of harmful material.

At the conclusion of the panel discussion, held in

early November of last year, it was felt that general agreement was reached on the following points:

Conclusions

• Surgical lasers are not the only devices that can produce a plume that could potentially contain material harmful to the patient or operating room nursing and medical staff;

• In most cases, no matter what the debris source, the precautions one would take to increase patient and operating room personnel are the same:

• Further research is necessary to better characterize either the specific nature of the by-products or the potential reinfectivity/carcinogenicity of these laser plume by-products.

• Additional research is especially important for better characterization of the interactions of pulsed lasers with tissue since pulsed lasers tend to produce larger particle sizes and presumably could more easily transfer viable material. However, following the recommended safeguards on evacuation, appropriate covering should also protect from these larger tissue particles.

• If the users of surgical lasers employ the safeguards recommended, i.e., confirmation that the laser is an advantage over other conventional surgical instrumentation, a proper smoke evacuation system, gloves, gowns and the wearing of appropriate masks and eyewear, then there is probably little or no significant risk to the patient or surgical team.

Exerpted from the *Journal of Laser Applications,* Volume 1, Number 2, March, 1989; pp. 4.

Laser surgery submissions...

Canadian Operating Room Nursing Journal

1. An Introduction to Surgical Lasers (Wright, Riopelle), Vol. 2, No. 5, Oct./Nov., 1984.
2. Controlling the Hazards of Laser Surgery (Wright, Riopelle), Vol. 2, No. 5, Oct./Nov., 1984.
3. Laser Surgery in Gynecology (Wright, Riopelle), Vol. 2, No. 5, Oct./Nov., 1984.
4. Outpatient Gynecological Laser Surgery: Patient Concerns and How to Deal With Them (Gervaize, Beresford), Vol. 2, No. 5, Oct./Nov., 1984.
5. Guidelines for Establishing an Institutional Laser Program (Gauntlett, Wright, Riopelle), Vol. 3, No. 2, April, 1985.
6. Laser Safety for CO_2, Argon and Nd:YAG Lasers (Ball), Vol. 4, No. 2, April, 1986.
7. Health Care Industry to Feel Impact of Laser Technology (Fagan), Vol. 4, No. 4, Sept., 1986.

Laser program for nurses to be held in Toronto in July

A series of post-graduate programs in laser surgery is to be offered this July in Toronto. Several of these programs are of special interest to operating room nurses/laser nurses and out-patient/day surgery nurses. All programs will be held at the King Edward Hotel on King Street in downtown Toronto.

The program most pertinent to nurses is "Lasers in Nursing," which will be held July 14 and 15. However, depending on the laser procedures performed at your institution, any of the others may be of interest. Other laser programs include:

Basic Colposcopy - July 12 - 13
Update in HPV/Genital Neoplasia - July 12 - 13
Gynecologic Laser Surgery - July 14 - 15
Lasers in General Surgery - July 14 - 15
Lasers in Nursing - July 14 - 15
Laser Assisted Angioplasty - July 16

This series of laser programs are sponsored by:

- The Department of Surgery, St. Joseph's Hospital, London, Ontario
- Biomedical Communications, Komoka, Ontario
- The Department of Obstetrics and Gynecology, Divison of Gynecologic Oncology, The University of Toronto.

For more information, course brochures, registration and related forms, contact:

Mary Ann Riopelle
Program Co-ordinator
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Extracorporeal shockwave lithotripsy (ESWL)

A treatment synopsis

By Darcy R. Kasprick, R.N.

One of the newest forms of treatment for the formation of urinary calculi (urolithiasis) is extracorporeal shockwave lithotripsy (ESWL). A Siemans' Lithostar lithotriptor was installed at the Health Sciences Centre in Winnipeg, Manitoba in March 1988 **(Photo A).** Since then, over 500 treatments have been performed.

Prior to the installation of this unit, a lithotriptor was being used which required the patient to be emerged in a water bath with a general or spinal anaesthetic. With our new generation lithitriptor, the treatment is performed without water emersion, without anaesthesia, and usually on an out-patient basis.

The following is a synopsis of the activities in our centre for treating a condition previously requiring up to ten days hospitalization.

Preparation & procedure

Special preparation prior to treatment is not required for a patient undergoing ESWL. However, nausea and vomiting may be associated with the treatment, possibly from the pain experienced from the shockwaves, or as a side effect of the analgesia being administered. Thus, the patient is advised to have a light meal on the day of treatment.

A kidney, ureter, bladder X-ray (KUB) is taken on the day of treatment to determine the position of the calculus. This is important as the calculus may have migrated from its original position, thereby affecting the outcome of the procedure. For example, a calculus may originally be in the upper ureter, and migrate down to the mid ureter overlying the sacroiliac joint by the time of treatment.

If a urinary tract infection is suspected, a urine culture is obtained. If positive, the patient should be placed on antibiotics prophylactically to prevent bacteremia during treatment (Cochran et al, 1988).

A ureteric stent is inserted for the treatment of large calculi (15-20mm) as the stent will cause some dilation of the ureter. This will facilitate the passage of fragments, and will also minimize ureteric obstruction after treatment as the stent will facilitate continous urine drainage. With the preparations complete, the patient is ready to be positioned on the table **(See photo B).** The shockwave heads, or the

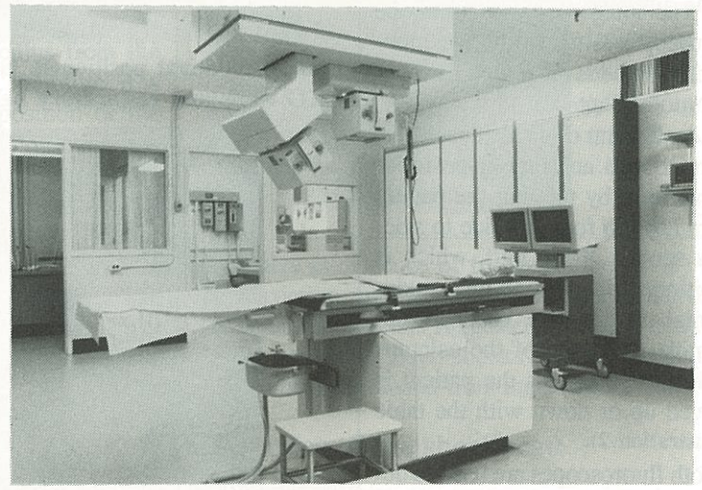

Photo A: ESWL treatment centre with control room in background. Fluoroscope monitors are attached overhead.