Announcing the ORNAC - Johnson&Johnson Bursary Fund for OR Nurses Seeking Advanced Education

Information

1. Purpose of the Fund

To financially assist ORNAC members in furthering their education.

2. Factors Influencing Assistance Available

1. Other financial assistance requested and / or granted.
2. Previous bursary funding granted by ORNAC.
3. Length, place and content of educational program.

Note: Financial assistance is not available for salary replacement.

3. Application Process

1.Fill out application form and submit an application form to ORNAC.

2.Reference letters- two, (2) from most recent employer which states the applicant's professional competence and experience, (ORNAC will request the reference).

3.Reference letter should address applicants potential to succeed in the program.

4.Submit autobiographical to include career accomplishments, education, goals.

5.Proof to be submitted of registration for the program.

4.Responsibility of Applicant Receiving Funding

1.Signed contract to be returned to ORNAC Executive within 30 days of receipt of contract, otherwise funding will be withdrawn.

Criteria For Selection of the ORNAC-Johnson&Johnson Bursary Fund

1. Applicant must be a member of a provincial group for minimum of three (3) years.

2. Primary employment focus - the Operating Room Nursing (staff,education, administration).

3. Applicant has actively participated in their respective Provincial Group and/or with ORNAC. Applicant's participation to be listed & submitted with application form.

4. References (2) indicate the applicant promotes professionalism, is responsible and accountable, and has potential to succeed.

5. Applicant's future plans at the completion of the program must include perioperative nursing.
**Perioperative nursing defined in (Rules & Regulations) Information Manual.*

For more information or to apply for the Bursary Fund please contact ORNAC"s Awards Committee Chairperson:

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Director of Nursing, OR/RR/Surgery
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Advances in General Anaesthesia Laser Procedures

By Sharon Ball, R.N.

Lasers were introduced as surgical tools about twenty five years ago. Lasers have become the method of choice in numerous procedures and in most surgical specialties are aiding or advancing them. Many operating rooms today are equipped with one or more lasers.

Laser surgery is exciting, challenging and ever changing as new techniques become possible and older techniques improved. Operating room nurses have taken the challenge of working with these high tech machines very seriously. They have involved themselves whole heartedly in acquiring the knowledge and skills necessary to facilitate the safe use and advancement of this expanding surgical modality. Nurses are important, contributing members of the laser team. From my experience, I have found that this is one surgical specialty that surgeons interact with the nurses as colleagues.

I work at Mount Sinai Hospital, a five hundred bed teaching hospital in downtown Toronto. My institute has had lasers since 1978 but, it has been in about the last six years that the program has expanded and really taken off. We presently have seven lasers in our twelve room operating suite and are currently evaluating another. My hospital offers a nurses' laser training course six to seven times yearly and we have seen a dramatic increase in the number of applicants for the course in the last two years. Our courses are now booked months in advance, therefore it is very obvious that laser use is indeed increasing.

The vast majority of patients having laser surgery at my hospital do so as inpatients. Seventy five percent of those patients have their procedures performed under general anaesthesia. I do forsee in the near future though that many of these procedures will be carried out in outpatient facilities, as in the United States.

I will be discussing the advances in general anaesthesia laser procedures. Many of these I have been involved in, while the others I have learned about through books, journals, conferences, observation and networking. The first area we will look at is Laparoscopic Laser Cholecystectomy.

Laparoscopic Laser Cholecystectomy

This approach has transformed gallbladder removal from a major abdominal operation to a minimally invasive procedure. Through news media coverage, this procedure is attracting wide patient appeal. The advantages of this method are: reduced hospital stays of 24-48 hours, a quicker recovery period with normal activity resuming five to seven days post-op, versus four to six weeks in the conventional surgical method, decrease in post-operative pain, better abdominal cosmetic appearance, reduced costs and minimal scarring. Disadvantages include: the surgeon must become a skilled laparoscopist which takes time, bleeding is harder to control, and there is always the possi-

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bility that, due to complications, an open procedure may have to be substituted. This point must be carefully explained to the patient.

A general anaesthetic is administered to the patient. A nasogastric tube and urinary catheter are inserted to decompress the stomach and bladder thereby lowering the chance of inadvertent perforation. A verres needle is inserted through a lcm incision at the umbilicus with the patient in either a 10-15 degree trendelenberg or supine position. The abdomen is insufflated with $C0_2$ gas. The needle is then removed and a 10mm trocar and sheath is introduced through the same incision. The trocar is removed and a laparoscope inserted into the sheath. A light cord, video camera, suction and insufflation tubing are connected.

The surgeon then inspects the entire abdomen. This is displayed on the video monitors situated on either side of the patient at the head of the operating table. Under direct visualization, three more sheaths are placed in the right upper quadrant. These will allow for passage of instruments necessary during the surgery. The patient may then be placed in reverse trendelenberg, to allow the transverse colon to move away from the surgical field.

The neck of the gallbladder is controlled with a 5mm grasping forcep and the aerolar and fatty tissues are dissected using blunt and sharp instrumentation, until the cystic artery, cystic duct and common bile duct are clearly defined. Once these structures are identified, the cystic artery is doubly clipped proximally and distally at the neck of the gallbladder. It is partially cut medially to the clips from the common duct to this new orifice, to remove any stones that may be present in the cystic duct.

A cholangiocath may be inserted at this time through a sheath or through a stab wound in the abdomen, into the cystic duct. It is fixed into position with a clip placed behind the catheter or partially across. Cholangiograms can then be facilitated in the routine fashion. The catheter is then removed.

The cystic duct is doubly clipped close to the common bile duct. The laser fibre is inserted into the surgical field and divides the cystic duct and artery. The laser is used to precisely dissect the gallbladder from the liver bed while providing good hemostasis. This is facilitated by moving the gallbladder in all directions by means of the grasping forcep holding it. A final inspection of the gallbladder fossa is carried out before transecting the fundus of the gallbladder from the liver. The laser may once again be used to achieve final hemostasis if the fossa is not completely dry.

The gallbladder is held while the scope is removed from the umbilical sheath and then reinserted into one of the upper sheaths. The gallbladder is regrasped by a forcep inserted into the umbilical sleeve and the entire unit is delivered into the abdominal wall. From there, the forcep, sheath and gallbladder are removed through the single layer of fascia under direct camera vision. The gallbladder may have to be decompressed by means of a long needle to facilitate removal.

The abdomen is once again inspected, irrigated and the fluid aspirated. The gas is then allowed to flow out of the abdomen. Sheaths are removed and the incisions closed in the usual manner. The patient is then transferred to the recovery room.

Patients may experience shoulder pain due to the escape of gas into the pro-peritoneal space but, this is easily controlled by mild analgesics. Discharge is usually on the first or second post-operative day.

Laser standards are strictly adhered to during the procedure.Other procedures being performed using the laparoscopic laser technique are appendectomy, hysterectomy, hernia repairs and at my hospital, we hope to start on bowel resections.

As the general surgeons become more skilled in the modality of laparoscopic laser surgery, this less invasive modality will become the treatment of choice in more procedures.

Gynecological Applications

Pelvic endometriosis is rapidly increasing and being diagnosed in a younger age group of patients. The causative agent is ectopic endometrial cells migrating out of the uterus and implanting themselves in various locations throughout the pelvis and abdominal cavities. Severe pelvic pain and inability to conceive bring these patients to their gynecologists.

Traditional treatment of hysterectomy and bilateral salpingoophorectomy are unacceptable for these young patients. Open laparotomy to excise the endometrial implants involves a long recovery period and conservative treatments such as long term oral contraceptives and hormonal therapy can not be tolerated by some patients.

Laparoscopic Laser Applications

The less invasive surgical modality of laparoscopic laser endometriosis vaporization has been shown to effectively control the disease with more successful results.

In the operating room, a diagnostic laparoscopy under general anaesthesia is performed. A uterine mobilizer is inserted in the uterus so that it can be manipulated during the procedure. The pelvic cavity is insufflated with $C0_2$ in the usual fashion. The trocar and sheath are inserted and the trocar is removed. A laparoscope is inserted and if ancillary instruments are to be used, other puncture sites may have to be made.

The abdominal cavity, uterus and pelvic organs are visually inspected with the aid of a dull probe. If pelvic endometriosis is identified, the laser fibre is introduced.

The argon, Nd:Yag and frequency doubled Yag are the lasers of choice due to their color selective ability. The fibre is positioned about 0.5 to 1.0 cm from the endometrial implant and the area is coagulated until it becomes blanched to approximately 1mm beyond the margins of the implant. The darker color of the implants readily absorbs the laser energy while the lighter coloured surrounding tissue is relatively unaffected. This allows for precise removal.

Patients postoperatively may be maintained on hormonal therapy until symptoms subside. Investigators are reporting improvement in 70-75% of the patients. This surgery can easily be performed in day surgery units.

Laser Endometrial Ablation

The primary method of treating women experiencing chronic menorrhagia and metromenorrhagia has been the hysterectomy. The development of the hysteroscope used in conjunction with the laser has offered a new avenue of treatment to these women.

Via the hysteroscope, the surgeon can now diagnose and perform laser endometrial ablation inside the uterus. Patients having this surgical treatment are prescribed the hormone danazol for at least one month preoperatively. This drug promotes endometrial atrophy so that the uterine lining will respond more effectively to laser photocoagulation.

The anaesthetized patient is positioned in lithotomy. The cervical canal is dilated in the usual D&C fashion to accommodate the passage of the hysteroscope. Irrigating solution of 0.9% sodium chloride is hooked up to the scope. Input and output of this solution must be measured accurately so that the amount of fluid absorbed during the procedure can be calculated. Fluid absorption is increased in this procedure due to to the fact that the laser beam may open capillaries during ablation that will absorb the fluid. Fluid overload could result if too much is absorbed. If more than 1,000 mL are absorbed, a diuretic may have to be administered.

A non contact Nd:Yag fibre is introduced through a stopper on the biopsy port of the hysterscope and it is passed out the distal end of the scope. Laser standards are strictly adhered to. The laser energy is then used to ablate the total endometrial lining. The tissue is ablated until blanching is observed. Should bleeding develop, the laser is used to coagulate the vessel. The uterine cavity is reinspected for bleeders or missed areas. Irrigating fluid is removed from the uterus and the hysteroscope removed.

The patient may experience abdominal discomfort for the first 12 hours post op but, this is easily controlled with mild analgesics. Large amounts of bleeding, shortness of breath, severe pain or a high temperature should be reported to the surgeon immediately.

Gas Embolism has been reported in a couple of deaths in the United States during this type of surgery. Air or gas cooled fibres in addition to gas uterine insufflation should not be used when lasering. Minute vessels may be opened and the gas from the fibre and the intra-uterine pressure leads to seepage of gas into the venous system. The liquid distention medium such as saline, provides better visibility, permits adequate cooling of bare laser fibres and minimizes the risks of gas embolism.

The expected outcome of this surgical modality is to achieve amennorrhea or hypomenorrhea. Early studies have shown that the majority of patients were very satisfied with the results. To date, the results have been promising and should improve considerably as the treatment is perfected.

Photodynamic Therapy

Another promising advance in laser surgical modalities is photodynamic therapy (PDT) of cancerous lesions. It has been shown to eliminate cancerous cells with minimal injury to healthy cells. Early investigators found that the tumour cells produced a red-orange fluorescence when exposed to ultraviolet light. It was proposed that this was caused by the endogenous porphyrins found in bacteria.

An artificial porphyrins was then developed and it was found that when this was absorbed by the tumour, its fluorescencing ability increased. Later studies showed that when the fluorescing tumour was exposed to light, the tumour would be destroyed by a light reaction within the abnormal tissue.

Much investigation in this area has been carried out by Thomas Dougherty and his colleagues at Roswell

Park Memorial Institute in Buffalo, New York. The most effective combination of specific light and hematoporphyrin dye was explored to produce impressive tumour death results.

This experimental therapy is being investigated and compared to surgical modalities in about sixty centres around the world. The clinical trial areas currently being looked at are esophageal, bronchial and urinary malignancies.

Photofrin, which is the special artificial dye, is injected intravenously (2.0 mg/kg. of body weight) via a freely flowing intravenous solution of 0.5% normal saline and 5% glucose over five to ten minutes. This drug is absorbed by all body cells but, normal cells will excrete it approximately 24-48 hours after being injected.

These patients are brought to the operating room usually 48 hours after this injection. At my hospital, a general anaesthetic is usually administered to these patients,due to their debilitative state. The red light of a 630nm tunable dye laser is administered by a fibre to the tumour.

When the laser energy hits the tumour filled with the light sensitive dye, tissue destruction and tumour death results. Surrounding cells which do not contain the high concentration of dye are relatively unaffected. Research continues into dye composition, duration of light exposure and effective delivery systems as the trial results are being compiled. FDA approval should be forthcoming in the United States by 1992.

New protocols are being developed for the treatment of ovarian cancer and brain tumours. Quadra Logic Technologies Inc. of Vancouver holds the rights to Photofrin.

In the area of bladder carcinoma, patient's diagnosed with carcinoma insitu or non-invasive, recurrent papillary disease, now have an alternative to bladder removal. With cystectomy, male patients are left impotent and all patients must wear an urostomy bag.

PDT therapy allows patients to be treated as often as necessary. Dr. Shumaker, from Pontiac, Michigan, USA reports to have treated eighteen patients to date using this modality. Twelve of these patients have no recurrence of tumour over a period of one to six years. Cancer did recur in the remaining six and they went on to the traditional treatment of cystectomy or Nd:Yag laser treatment.

In the area of esophageal cancer, this therapy is palliative only. Patients having PDT seem to tolerate it better than alternative treatments. Patients following treatment can swallow without difficulty, have less pain, sleep better and are able to eat and enjoy work and leisure activities. Relapses do occur and the therapy can be repeated.

Dr. Balchum, in Los Angeles, California has been active in all phases of the lung research. He reports that patients with large endobronchial cancers, are treated with PDT to open the bronchus. Again, this is a palliative treatment only. The patients' breathing improves immediately which helps improve the quality of their life.

Dr. Balchum is also investigating early stage lung cancer. It appears that PDT may offer a cure to these patients, if detected early. In order for early detection to be achieved, he is taking advantage of Photofrin's capabilities - fluorescent diagnosis. Patients are injected with the Photofrin,in the usual manner. Bronchoscopy is carried out using a violet light. Suspect areas fluorese. These areas are biopsied and if positive, PDT treatment is carried out. This is a safe alternative and a much less invasive procedure than the lobectomy.

Some of the most exciting advances in neurosurgery are being carried out by Dr.Muller in Toronto. He is heading the team developing PDT treatment for brain tumours. As much of the tumour possible is removed surgically. This cavity is then inflated with a large balloon catheter and a fibre is inserted into it. The PDT laser is fired to remove residual tumour. The catheter can be left in the patient for up to three days, to facilitate a repeat treatment. Dr. Muller reports that all patients have shown some response. Brain tumours do not metastasize and thus this treatment could increase patient survival.

At Mount Sinai, we are in the lung protocol study. We are also on the compassionate protocol to treat patients who have inoperable obstructive rectal tumours with PDT. We have treated approximately fifteen patients in the last year, using this method. A water filled glass test tube, with fibre inserted through a locking cap, is inserted into the rectum. The laser is then turned on and the area treated for the calculated amount of time. The patient returns to the operating room two days later for a second treatment. The tumours have shrunk in size, some dramatically, and patient comfort is returned. This is an area where perhaps Dr. Balchum's fluorescing technique could be used for early detection and treatment, thereby avoiding major abdominal resections and perhaps death.

The main adverse reaction to this treatment is the

light photosensitivity these patients experience for four to six weeks post dye injection, therefore, patient teaching is an extremely important aspect of this modality. Teaching begins in the surgeon's office when the patient decides to undergo the treatment. The risks and benefits are thoroughly explained to the patient and brochures are given to reinforce this information. Exposure to sunlight could cause second or third degree burns.

Dark sunglasses should be worn for the first week following injection. Once home, the patient must cover windows that allow direct sunlight in the room where they will be. They are told to only go outside in the very early morning or after sundown. Should the patient have to venture out during the day, all exposed skin must be covered. Long sleeved clothes, gloves, hat, long pants, sunglasses and sunscreens with high SPF rating should be worn. When riding in a car, in daylight hours, the patient should sit in the backseat and cover the windows. Exposure to a very bright reading light for more than an hour, could also cause burns.

After four weeks, the patient is instructed to carefully test a small area of skin on the back of their hand for 10-15 minutes only. If no erythema or edema occurs over the next 24 hours, the patient is encouraged to go outdoors for short periods over the next week and a half and gradually increase the time. During the summer, light precautions should be maintained for up to eight weeks.

Lasers in Otology

Lasers have been used by otolaryngologists for about 15 years. The $C0_2$ was the laser they used to treat laryngeal, vocal cord and nasal pathology. The cumbersome articulating arm of the laser when attached to the microscope, and the slightly inaccurate aiming beam, slowed down the surgeon's expansion into the sensitive structures of the middle ear.

In the late eighties, the KTP laser, with its fiberoptic delivery system, provided the ENT surgeons the accuracy that they required. Today, tympano mastoid procedures and stapedectomies are being performed using the laser.

Laser stapedotomies are being performed on an outpatient basis. The laser is employed along with hand held instruments. Trauma and bleeding are reduced and the patients experience little or no vertigo and are released home a few hours post-operatively.

The patient receives I.V. sedation and a local anaesthetic. A tempanomeatal flap is turned in the conventional manner and the oval window is exposed.

The laser is used to vaporize the stapedial tendon and the posterior crus. Bone char is suctioned from the surgical field and the incudostapedial joint disarticulated. If the anterior crus is visible, it is vaporized and the substructure of the stapes is removed. Six to eight laser firings are grouped circularly on the footplate, creating a fenestra. Bone is removed by a fine suction tip and rasp. A piston is inserted into the fenestra and secured to the incus. The area is then sealed with tissue. The incision is closed and packed in the traditional manner.

Considering the foregoing discussed procedures it can be appreciated that laser surgical treatment modalities are indeed advancing. New applications, wavelengths, and surgical skills are constantly developing. The less invasive surgical treatments are very appealing to patients, surgeons and health care facilities. It is a very exciting area of surgery in which to be involved.

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Laser Nursing - A Perioperative Challenge

By Penny J. Smalley, R.N.

Laser technology, once a dream of scientists and visionaries, has now become an accepted method of surgical and medical treatment in hospitals, clinics, and private offices, around the world. The technology has had an impact on every clinical discipline, including general surgery, otolaryngology, dermatology and plastic surgery, gynecology, neurosurgery, gastroenterology, urology, ophthalmology, podiatry, physical therapy and oncology.

The explosion of high technology in the clinical setting has created the need to redefine the traditional role of the perioperative nurse. The expanded role focuses on a combination of standard nursing practice - evaluation of patient's needs, and implementation of care planned to meet those needs - with an expanded scope of practice focused on technical, operational, and administrative skills. The laser nurse specialist is challenged to incorporate a whole new vocabulary and knowledge base into an already complex practice. That requires training, practice, and dedication, often uncompensated, and rarely recognized. However, the excitement of being part of a rapidly growing, dynamic field of medicine, does serve to reward the nurse who perseveres and takes advantage of his/her opportunity to learn and grow professionally.

In order for a hospital to maximize its acquisition of laser technology, it must first establish organized administrative governance. Lasers affect every aspect of providing care, from clerks to professional staff, and in order to manage it, a laser committee must be formed. The mission of the committee, is to provide guidance and overall supervision of lasers in the facility. Since laser surgery is a collaborative, multidisciplinary effort, the committee should be comprised of: physicians from every clinical discipline using or interested in using lasers; the operating room supervisor; endoscopy or out-patient supervisor (if lasers will be used in these areas); biomedical engineering; risk management; the laser safety officer; hospital administration; anesthesia; planning and development department; and, continuing education (both medical and nursing).

Laser committee meetings should be scheduled at regular times, with a written agenda, and can address many topics such as: credentialing of medical staff, education and training of nursing staff, acquisition of equipment and instrumentation, new procedures, case reviews, safety audits, development of documentation methods, quality assurance monitoring, engineering concerns, clinical research programs, patient education materials, evaluation of reference materials, and updating of policies and procedures. The chairperson is usually a physician, and co-chair, the laser safety officer. Once a laser program is well established (one year average for start up), the committee meets as needed, with a minimum of quarterly, for review.

Once the committee is functioning, the program plan can be developed. This includes a time line that allows for proper training before the laser is put into clinical use. Educational needs of both medical and nursing staff must be evaluated, and classes must be scheduled. Operational inservice is provided by the manufacturer, but does not include the fundamental theory of laser technology. It is essential for everyone who will work with lasers, to attend formal classes that present: laser physics, tissue interactions of all the commonly used wavelengths, instrumentation and delivery systems, safety, case management, and clinical applications.

Laser education can be obtained in several ways, depending on the facility and its needs. Continuing education courses are available periodically, in the