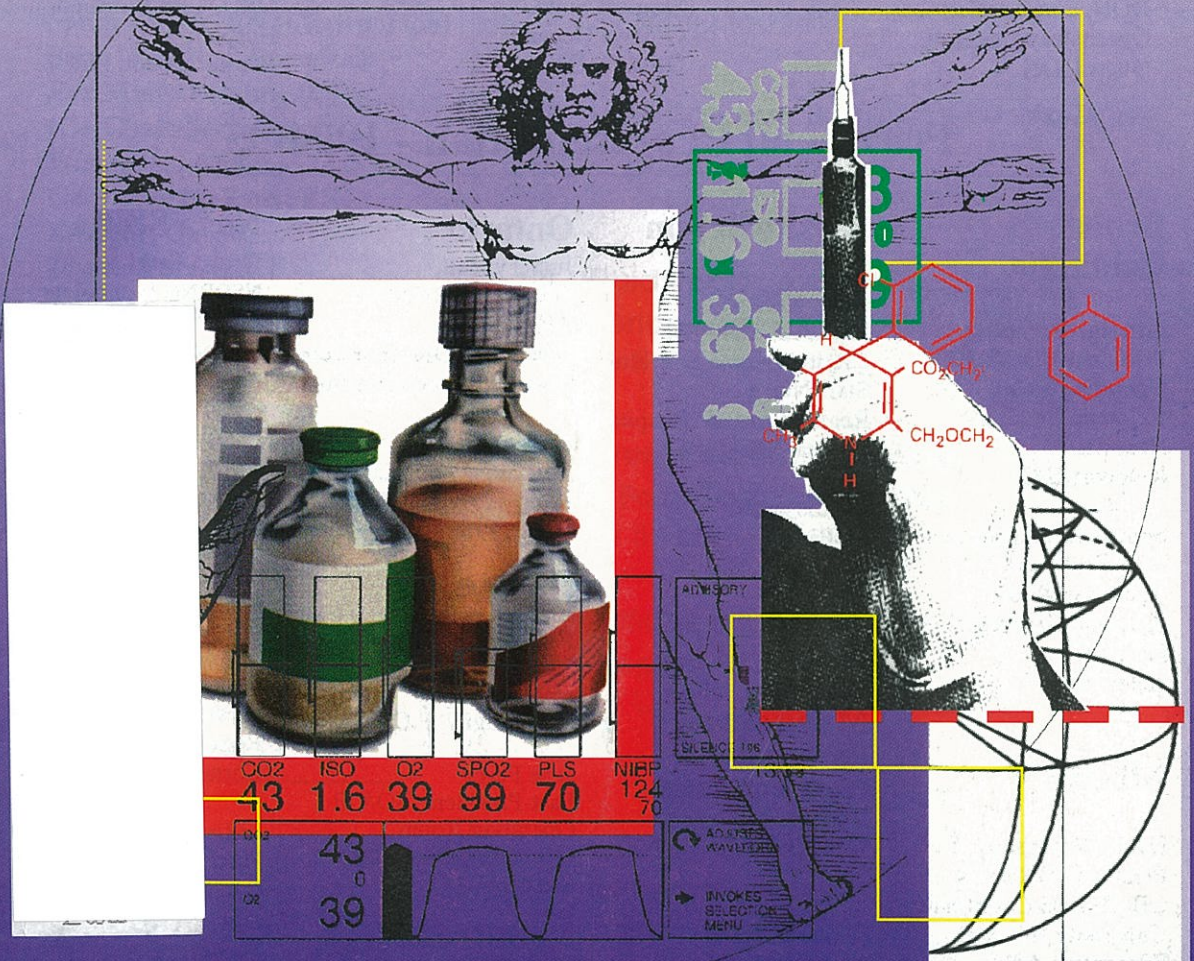


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Volume 12, No. 4, November/December 1994

drugs used during anesthesia



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- Fluid Replacement Therapy
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Into The Land of Nod Drugs Used During Anesthesia in Day Surgery

By Marjorie Phillips, R.N.

Narcotic Analgesics/Opioid Antagonists

Narcotics activate opiate receptors in the central nervous system altering a patient's perception and response to pain. Their site of action is both brain and spinal cord neurons.

Morphine : A naturally occurring derivative of opium. Effective in relief of severe pain. Following I.V. injection maximum pain relief occurs 20 minutes after injection.² Analgesia is under 6 hours for parenteral morphine but persists up to 18 hours if spinal morphine is used. It causes respiratory depression usually noted as a decrease in respiratory rate. Perinasal and periorbital itching is common. With a morphine overdose pupil size becomes pinpoint.³ Nausea, biliary spasm which may mimic angina, histamine release, and urinary retention is also noted with the use of morphine.

Abstract

This paper lists and describes some of the drugs used during anesthesia in a Day Surgery Operating Room. The classification, action and implications of these drugs are addressed. The discussion is presented under the drug classes as Narcotic Analgesics/Opioids Antagonists, Opiate Antagonists, Induction Agents, Muscle Relaxants/Neuromuscular Blocking Agents, Inhalation Anesthetics, Cholinesterase Inhibitors, Anticholinesterases/Parasympathomimetics, Anticholinergics/Antimuscarinics/Parasympatholytics, and Antiemetics.

Meperidine (demerol) : Synthetic. For use in moderate to severe pain. Like morphine, it causes respiratory depression and has many of the same side effects common to morphine such as nausea. It must not be used for patients taking, or have taken within 14 days, monoamine oxidase inhibitors since a potentially lethal response can occur. In PARR demerol is used to combat shivering.

Fentanyl (sublimaze) : Synthetic, 80 to 100 times more potent than morphine.⁴ Adjunct to general anesthesia. It has a rapid onset, and in low doses, a short duration of action.² Less emetic activity is noted with the use of Fentanyl² compared to morphine. No histamine release.⁵ Causes little change in blood pressure, cardiac output and systemic vascular resistance⁵, therefore it is used for patients with cardiac disease. It does share with many narcotics a marked respiratory depressant effect, particularly profound because of its rapid onset of action.⁴

Alfentanyl (alfenta) : Synthetic. Adjunct to general anesthetic. Possesses a very short half life.² It does not cause histamine release.⁵ Can cause respiratory depression. Maximal activity within 120 seconds of injection.

Codeine : Naturally occurring.³ For mild to moderate pain. Can cause respiratory depression. Other adverse effects include those seen with morphine, e.g. hypotension, bradycardia, nausea, vomiting, dry

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mouth, urinary retention, pruritis. It is often used to treat an unproductive cough.³

Spinal Narcotics : Used for post-operative pain control. The most common injection sites are the epidural space and the lumbar subarachnoid space. Diffusion of narcotics out of the spinal cord depends on their lipid solubility.⁵ Morphine is the least lipid soluble of the narcotics and thus lingers longest in the cerebral spinal fluid.⁶ Onset is 30 to 60 minutes and duration is from 12 to 24 hours.⁶ The drugs are metabolized in the liver and a small amount is excreted by the kidneys.⁵ The side effects are the same for epidural and spinal narcotics as they are for other routes e.g. respiratory depression, urinary retention, nausea, vomiting, and pruritis but may be delayed up to 24 hours. A rare complication of epidural analgesia, not attributed to morphine, is the formation of a hematoma in the epidural space.⁶ This problem is associated with inherited clotting deficiencies or administration of anticoagulants.⁶ An abscess is also rare and presents as does the hematoma with back pain and leg weakness with the addition of paraesthesia and fever.⁶ The symptoms from hematoma may appear within hours or several days following the procedure.

Opiate Antagonists

Act by direct competition at opiate receptors in the central nervous system.¹

Naloxone (narcant) : Reverses the depressant effects of narcotics. Results can usually be seen in one to two minutes. Incremental doses are repeated until reversal is complete. Dependent upon the relative amounts of Naloxone and opiate present, it is effective from 45 minutes to four hours. Long acting or high serum concentrations of narcotics may outlast the Naloxone and respiratory depression may return. Any dose might eliminate the analgesic effect of the narcotic resulting in pain with elevated blood pressure and tachycardia in response. A rapid reversal may induce nausea, vomiting, tachycardia, arrhythmias and diaphoresis.⁴ There have been no reported experiences of overdose.²

Induction Agents

Propofol (diprivan) : A relatively new anesthetic-sedative. It acts rapidly and smoothly within 40 seconds. It has a high metabolic clearance resulting in a 34

to 66 minute half life. When used for induction and maintenance, upon discontinuation of infusion, most patients are responsive to verbal command and oriented in 7 to 8 minutes. However, as with any anesthetic, patients must not engage in activities requiring alertness such as driving. The formula contains soybean oil and egg lecithin and has no preservatives. Our patients are asked if they are allergic to eggs or soybeans. Once opened, it must be used or discarded within 6 hours.

Propofol does not cause histamine release. It does cross the placenta and is detectable in human milk. Despite antiseizure properties, tonic clonic movements have been reported during Propofol anesthesia. Alfentanil concentrations are higher than expected with the use of Propofol. It is metabolized chiefly in the liver and is excreted by the kidney.

The above is adapted from: *The product information sheet, Zeneca Pharmacy, Mississauga, Ont., 1990*.

There is significant antinausea and antipruritic effects with propofol use. Dreaming is very common, most notably erotic dreams. Patients often have happy expressions and say that they had a good dream. Those who volunteer information about the dreams admit to gardening, holidays, their family, nothing startling!

Thiopental Sodium: (pentothal) A short acting intravenous barbiturate.

Peak action is 50 seconds. It has a very high PH of 10.6 and causes tissue irritation that may cause necrosis when extravascular. Recovery is rapid with residual somnolence and retrograde amnesia.² It penetrates all tissues of the body, and is metabolized mainly by the liver.

Ketamine (ketalar) : It is a rapid acting dissociative anesthetic. It blocks only the pain conduction and perception portions of the central nervous system. It has a bronchodilating effect, generalized increase in sympathetic tone is noted and pharyngeal and laryngeal reflexes may remain intact.⁴ Adults may experience bad dreams, children are not as susceptible to these disturbances. With I.V. administration, recovery is about 30 minutes.⁴

Midazolam (versed) : A water soluble benzodiazepine anesthetic, sedative, premedicant with central nervous system depressant effects. It can produce sedative-hypnotic effects, induce anesthesia and anterograde amnesia.² When questioned about surgery time, patients consistently report far less time taken than was the case.

Sedation following I.V. injection is about 3 to 6 minutes and recovery within two hours.² Patients are

cautioned against driving and operating machinery. It requires a longer time for fat patients and patients with congestive heart failure, liver or kidney problems to eliminate Versed. Erythromycin increases and prolongs the effects of Versed.²

Muscle Relaxants/Neuromuscular Blocking Agents

Muscle relaxants interfere with the transmission of nerve impulses at the myo-neural junction. Muscles contract when an impulse causes acetylcholine to be released by a nerve (axon), which then cross the space between a nerve and a muscle and activates the receptor site of a muscle. The acetylcholine is quickly destroyed by the enzyme acetylcholinesterase thus opening the muscle receptors.

Anaesthetists use two types of blocking agents to cause muscle relaxation, depolarizing and non-depolarizing neuromuscular blocking agents. The depolarizing muscle relaxants cause a contraction before relaxation. They cross the cleft between nerve and muscle and activate the receptor site causing a contraction. The enzyme pseudocholinesterase is needed to break down these drugs. This is a much slower process than acetylcholinesterase breaking down acetylcholine. Thus the muscle can not be stimulated again until the depolarizing drug has cleared. This takes 3 to 5 minutes.

The non-depolarizing muscle relaxants do not cause a contraction before relaxation. They cause relaxation of the muscle by achieving a tissue concentration greater than acetylcholine and therefore are able to overwhelm the receptor sites of the muscle. Hence, the muscle cannot be stimulated. These drugs can be reversed with anti-cholinesterases.

Succinylcholine (anectine) : It is a depolarizing muscle relaxant used mainly for short procedures requiring relaxation such as intubation, bronchoscopy and esophagoscopy. If the patient is unable to metabolize this drug, they will need post-operative ventilation. Two to twelve hours is sometimes necessary for anectine to be metabolized. Potassium is released into the extracellular space with the use of anectine. In some cases with exaggerated release high serum potassium levels result in cardiac arrests.

The above information on muscle relaxants is adapted from : Marshall M., Module 1, *Physiological*

Effects of General Anesthesia, Vancouver Community College, 1987.

Pancuronium (pavulon) : Nondepolarizing relaxant of medium duration, (just under one hour), can be used for intubation, peak action is 3 minutes.² It has the ability to increase the heart rate.⁵ Pavulon is potentiated by inhalation anesthetics, hypokalemia, some cancers, and certain antibiotics.²

Tubocurarine (tubarine) : Nondepolarizing. Causes significant histamine release. Some antibiotics and diuretics increase its duration of action and potency.²

Atracurium (tracrium) : Nondepolarizing. Produces dose dependent histamine release. In combination with high doses of narcotics bradycardia and asystole can occur. Onset is 3 to 5 minutes and in 20 to 35 minutes 75% or more of the effects of tracrium have been eliminated.⁵

Vecuronium (norcuron) : Nondepolarizing. There is no histamine release. Onset time is 3 to 5 minutes. 75% recovery in 20 to 35 minutes. It is metabolized by the liver.⁵

Metocurine Iodide (metubine) : Nondepolarizing. Onset takes 2 to 8 minutes. Duration is variable, from 60 to 82 minutes. Mainly excreted unchanged in the urine. Associated with histamine release.⁵

Inhalation Anesthetics

These agents produce a state of unconsciousness and muscle relaxation.

Nitrous Oxide: Nitrous oxide is the most commonly used anesthetic gas. It is non potent and is used to potentiate other drugs used during anesthesia⁶ Used alone it will increase blood pressure. Nitrous oxide is the least soluble in blood of the inhalation anesthetics and therefore has a faster onset and recovery than Halothane or Isoflurane.⁷

Halothane (fluothane) : A potent sweet-smelling volatile liquid anesthetic. It causes bradycardia, decreased blood pressure and reduced tidal volume. Patients often shiver when emerging from this anesthetic. A small amount is metabolized by the liver, but it is excreted mostly by the lungs. Repeat exposure may cause hepatic necrosis.

Isoflurane (forane) : A potent volatile anesthetic



supplied as a clear liquid. It is a respiratory depressant and irritant. Isoflurane does not markedly disturb cardiovascular stability. It is thought to be non-toxic to the liver and kidneys.

Cholinesterase Inhibitors/Anticholinesterases/Parasympathomimetics

These inhibit the breakdown of acetylcholine and therefore reverse nondepolarizing skeletal muscle relaxants.⁸

Neostigmine (prostigmin): The half life is 51 to 91 minutes. It is excreted mainly by the kidney.² It can cause, if improperly administered, bradycardia, asystole, nausea, vomiting, abdominal cramps, increased bronchial secretions, diaphoresis, and weakness.²

Pyridostigmine (regonol) : Its action is immediate. About 80% of the I.V. dose is excreted in the urine within 24 hours.² Improper administration causes the same effects as Neostigmine with the addition of central nervous system reactions such as: anxiety, restlessness, vertigo, headaches, drowsiness, confusion, cheyne-stokes breathing, coma, convulsions.²

Edrophonium (tensilon) : It has a rapid onset and renal excretion accounts for 75% of its elimination

with the liver metabolizing 30%.⁵ Edrophonium can cause bradycardia, hypotension and augment secretions of the bronchial, lacrimal, salivary, gastric and sweat glands.

Physostigmine (antilirium) : It crosses the blood brain barrier and increases central nervous system acetylcholine levels making it useful for depression caused by atropine, and scopolamine with partial antagonism of other anesthetic agents.⁸ The primary use is for atropine poisoning. The side effects are the same as those found with other cholinesterase inhibitors.

Anticholinergics/Antimuscarinics/Parasympatholytics

These drugs act by blocking the action of acetylcholine or other cholinergic stimuli.² They are excreted unchanged in the urine.²

Atropine Sulfate: Used for the relaxation of gastro intestinal, biliary and genitourinary tracts and the suppression of salivary, gastric and respiratory tract secretions.² It increases the heart rate by blocking the effect of the vagus nerve; this action counteracts the bradycardia caused by inhalation anesthetics or surgical stimulus. Atropine decreases sweating and can result in bright red babies from compensatory vasodilation.

Glycopyrrolate (robinul) : It has a longer duration of action than atropine. It does not cross the blood-brain barrier. It is also used as a reversal agent of nondepolarizing muscle relaxants, as it protects against bradycardia and excessive secretions which neostigmine and pyridostigmine do not.²

Antiemetics

Droperidol (inapsine) : This drug is also a neuroleptic. It has a rapid onset and the duration of action is generally 2 to 4 hours. It is metabolized in the liver and excreted in the urine and bile.² It can cause spastic movement, tremors, chills, vertigo, facial sweating, hypotension and tachycardia.² Inapsine potentiates narcotics, barbiturates, tranquilizers and alcohol, hence in tends to prolong post anesthetic recovery.

Dimenhydrinate (gravol) : It is used for post-operative vomiting and drug induced nausea. Gravol causes drowsiness.

Local Anesthetics

Local anesthetics may contain epinephrine hydrochloride (adrenalin). It is a sympathomimetic drug, with a rapid onset and short duration of action. It is metabolized by the liver and excreted in the urine.² It increases the cardiac output, raises systolic blood pressure and at low doses lowers diastolic and sometimes systolic blood pressure. Smooth muscle of the bronchi are relaxed and thus it is an antagonist of histamine.² Do not use in end organs such as fingers, toes, ears, nose, or penis as vasoconstriction may cause necrosis.

Lidocaine Hydrochloride (xylocaine) : It is often used because it is potent, has a rapid onset and a moderate duration of action. It can depress or stimulate the cerebral cortex and medulla producing drowsiness, nervousness, dizziness, blurred vision, nausea, tremors, convulsions, respiratory and cardiac arrest.²

Bupivacaine (marcaine) : It is valued for its long duration of action,⁵ up to 16 hours. There is also a period of analgesia after the return of sensation.² Excessive plasma levels of marcaine cause the same signs and symptoms that xylocaine produces though it has significantly higher cardiac toxicity.

Cocaine: It is well absorbed across the mucous membrane and has a half life of about one hour.⁵ It inhibits the reuptake of norepinephrine resulting in

the signs and symptoms of the sympathetic nervous system.⁵ In the central nervous system, cocaine is initially stimulating producing euphoria, excitation, tremors, seizures, and emesis following which the patient may experience depression and respiratory failure.⁵ Moderate doses elevate blood pressure and heart rate.⁵ Dysrhythmias, hyperglycemia, hyperthermia and myocardial infarction can also occur.⁵ Because of swallowed cocaine used in nasal surgery significant effects can be manifest from gastric absorption.

Conclusion

Used judiciously, the drugs discussed in this paper ensure a safe and effective anesthetic and smooth recovery for patients going through Day Surgery operating rooms.

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Limb Salvage Surgery: An Advance in Surgical Technique

By Wendy McCulloch, R.N.

Introduction

"Surgery is the primary and oldest treatment for malignant musculoskeletal tumors. Until the 1970's amputation was the accepted surgical procedure for

Abstract

"Surgery is the primary and oldest treatment for malignant musculoskeletal tumors. Until the 1970's amputation was the accepted surgical procedure for patients with malignant tumors of the extremities. Recent advances in adjuvant treatment modalities such as chemotherapy and radiotherapy, bioengineering designs of internal prosthetic devices, radiographic workups, and bone and tissue transfers provide some individuals with the option of limb-preservation" (Lewis, 1992, p. 477-478). One limb salvaging technique uses a metallic implant to replace resected tumors of the bone. It is this surgical orthopaedic advancement that is currently being used in the resection of primary malignant bone tumors of the lower extremities at Mount Sinai Hospital, Toronto, Ontario.

The objectives of this paper are to review the management of musculoskeletal tumors in "skeletally mature patients", and to review a system currently being utilized at Mount Sinai Hospital which provides a surgical option for resection and reconstruction of malignant bone tumors. The role the perioperative nurse plays in providing care to patients having limb salvage surgery will also be described. All three objectives will provide insight into the challenges facing orthopaedic oncology patients who are living with cancer.

patients with malignant tumors of the extremities. Recent advances in adjuvant treatment modalities such as chemotherapy and radiotherapy, bioengineering designs of internal prosthetic devices, radiographic workups, and bone and tissue transfers provide some individuals with the option of limb preservation" (Lewis, 1992, p. 477-478). One limb salvaging technique uses a metallic implant to replace resected tumors of the bone. It is this surgical orthopaedic advancement that is currently being used in the resection of primary malignant bone tumors of the lower extremities at Mount Sinai Hospital, Toronto, Ontario, Canada.

The objectives of this paper are as follows; first, to review the management of musculoskeletal tumors in "skeletally mature patients". Second, to review a system currently being utilized at Mount Sinai Hospital which provides a surgical option for resection and reconstruction of malignant bone tumors, and third to describe the role the perioperative nurse plays in providing care to patients having limb salvage surgery. All three objectives will provide insight into the challenges facing orthopaedic oncology patients who are living with cancer.

Management of Musculoskeletal Tumors

A musculoskeletal tumor can originate from connective tissue, fibrous tissue, fat, muscle, blood vessels, lymph vessels, synovial tissue, peripheral nerves or bone. Tumors can be classified as benign or malignant in soft tissue and bone. Both types of tumors can crowd and compress nearby organs, blood vessels and nerves causing pain and interference with normal function. Malignant tumors, accounting for one to two percent of all adult cancers, can also invade surrounding tissue and metastasize to other parts of the body. Soft tissue tumors will not be addressed in this

paper. Diagnostic work-up may be similar but the management of soft tissue tumors is different.

Pre-operative work-up for the patient includes physical examination, x-rays, C.T. and M.R.I. scans of limb and chest, bone scans, angiography, diagnostic biopsies, and frozen section (pathology). Following a carefully planned open incisional biopsy, staging and grading of the patient's tumor provides an initial diagnosis. "Determination of the surgical procedure reflects the patient's age, histological diagnosis, associated tumor behavior, the anatomic location of the tumor, the results of staging work-up, functional goals and patient's viewpoints in the decision-making process" (Lewis, 1992, p. 478). Ultimately a decision is made for limb salvage or amputation.

Tumors of the bone can be classified as benign, metastatic, or primary malignant. Benign bone tumors can be aggressive, requiring curettage or excision and possible bone replacement. Bone from a donor (allograft) or the patient's own bone (autograft) along with some form of internal fixation are often used to provide adequate bone stabilization. Metastatic tumors of the bone are also treated surgically if required. These tumors may cause weakening of the bone which can result in pathological fracture. As a result, the patient becomes mechanically compromised. Tumors may also compress sensitive anatomical structures, i.e. the spinal cord, necessitating decompression or debulking of the tumor. Surgical goals would be palliative rather than curative.

High Grade and Low Grade Tumors

Primary malignant tumors are described as being low and high grade tumors. Low grade tumors, such as a Chondrosarcoma, are resected and reconstructed if feasible. Chemotherapy may be utilized preoperatively in order to reduce tumor size. High grade tumors such as Osteosarcoma are treated with pre- and postoperative chemotherapy according to appropriate protocol. Chemotherapy is an important part of the total treatment regime. It is usually necessary to wait one to two weeks following the patient's last session of chemotherapy before surgery is scheduled. This permits adequate time for the haematologic and immune systems to recover in order to minimize risks of postoperative immunosuppression and wound-healing complications. "The rationale for treatment is to treat micrometastasis, decrease the tumor size and viability, and assess the effectiveness of the chemotherapy agents on the individual tumor. Adjuvant treatment

can increase the ability to salvage a limb" (Piasecki, 1991, p. 34-35).

The essence of surgical management for patients with musculoskeletal tumors is represented as follows:

"There is no treatment for tumors, only for patients. There is no place for applying a single method of treatment indiscriminately to all patients to accumulate a series. Each patient is entitled to receive customized, life-style oriented, one-of-a-kind management" (Enneking, Vol. 1, 1983, p. 218).

Surgical Technique for Resection of a Primary Bone Tumor

Competent recognition and management in terms of eradicating local disease at the primary tumor site is appropriately expressed as follows: "The early recognition of a primary malignant bone tumor and the proper management can mean the difference between a limb salvage and an amputation or the difference between life and death" (Lewis, 1992, p.1).

"The surgical treatment of high grade malignant musculoskeletal tumors during limb salvage surgery involves resection of the tumor, reconstruction of the surgical defect and provision of adequate soft tissue coverage" (Lewis, 1992, p. 479).

In the past, surgical reconstruction of bone tumors at the distal femur involved any combination of arthrodesis, use of donor cadaveric allograft bone, autograft bone and/or usually cemented prosthetic implants.

Another surgical option is a metallic implant system. At Mount Sinai Hospital patients having primary bone tumors of the lower extremity, with non metastatic disease, become candidates for this system.

The benefits of this particular system are: reconstruction without the use of allograft, a shorter period of rehabilitation following surgery and modified functional use of the salvaged limb.

At the knee, bulk allograft utilized to replace resected bone and tumor is found to have a higher risk

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of fracture and infection than utilization of a prosthesis alone (Wunder, 1993). The metallic implant system provides the surgeon with the option of tumor resection and reconstruction as well as the possibilities of replacing the proximal femur, distal femur, proximal tibia, total femur and total femur with proximal tibia (Howmedica, 1991).

Prior to surgery four to six units of blood are crossmatched. Pain management includes preparing for epidural catheterization insertion intra-operatively.

In the Operating Room, following induction, a Foley catheter and invasive monitoring lines are inserted. Preventative measures taken to reduce the risk of infection may include laminar air flow with body exhaust suits and prophylactic intravenous antibiotics. A complete selection of prosthetic components are chosen to replace the resected bone based on radiographic images.

After appropriate positioning, prepping and draping of the leg, a sterile tourniquet is applied. The skin incision is made. The lateral or medial approach must accommodate the previous biopsy scar to prevent creation of a tract which would further spread tumor cells.

The following steps highlight the surgical technique for resection of a distal femoral tumor using the metallic implant system.

1. Exploration and dissection of the bone tumor

Surgical exploration and dissection of the tumor begins with preservation of vessels, nerves and muscles, essential for postoperative limb function. This is the most tedious segment of the surgical procedure, but is essential for limb salvage.

2. Resection and removal of the distal femoral tumor

Margins have been estimated, prior to surgery, based on radiographic images. The femoral bone is cut proximal and a sample of bone marrow, proximal to the tumor, is sent to pathology to ensure a clear margin. If tumor invasion is suspected at the knee then the distal cut is made at the proximal tibial plateau and en bloc excision is made incorporating the knee joint. Removal of the knee joint in its completion prevents the joint from being opened and minimizes the risk of seeding tumor cells.

Resection of the tumor includes removing normal bone and tissue surrounding the tumor, in order to

establish wide or radical resection margins. Once the femur and tibia are free the entire specimen is removed and sent to pathology. The pathologist cuts open the tumor and surgical margins are established.

Frozen sections are sent from the remaining bone marrow and soft tissue from the distal margin. If these margins are established as being clear of tumor cells the preparation of the femur and tibia begins for insertion of the prosthesis.

3. Reconstruction using a metallic implant system

The prosthesis is a porous, uncemented, modular resection system made of vitallium. It is an updated version of the "Kotz Modular Femoral and Tibial Reconstruction System (KMFTRS)" and is the result of collaboration between Professor Kotz of Austria and Professors Campanacci & Capanna of Italy, all orthopaedic surgeons. Internationally the KMFTRS has been in use since 1982 and has benefitted more than 1500 patients (Howmedica International, 1991). At Mount Sinai this system has been used and evaluated since 1989. The updated system consists of three major components: bone and joint replacement parts and anchorage pieces. Accessory pieces and instrumentation are used to assemble the prosthesis together. All bone replacement prosthesis have a porous finish which provides a site for soft tissue attachment and autogenous bone grafting. Cost of the various components can total anywhere from \$5,000 to 10,000 Cdn. per patient, considerably less than a custom made prosthesis. The prosthesis components are assembled to replace the length of the bone resected in order to preserve bone length and function.

(See Figure 1).

Usually the tibia is templated and reamed first. A tibial replacement piece is inserted and secured using the tibial impactor. The resected femur is prepared by reaming and shaping the medullary canal to impact the chosen anchorage piece. A combination of extension pieces may be used to bridge the distance between the anchorage piece and the distal femoral piece, depending on the length needed.

These pieces are connected and are temporarily secured. The knee joint is then hinged together at its axis and a trial reduction performed. The limb is checked for stable alignment and length as in any joint replacement surgery. Leg length discrepancy can be corrected through resection and/or selection of different sized components. Once the appropriate length is

achieved, the prosthesis is re-assembled and permanently secured with screws at the anchorage piece. The distal femoral piece is driven into the anchorage piece using the femoral impactor. The knee joint is then hinged and rechecked for alignment. The patella and patellar tendon may or may not require fixation depending on the tumor and degree of flexion achieved.

4. Adequate tissue coverage and wound closure

After successful implantation of the prosthesis, primary closure begins, to allow for adequate soft tissue and skin coverage of the prosthesis. Some patients may require a local transposition flap (i.e. gastrocnemius muscle flap) to replace muscle resected with the tumor. During wound closure it is important to avoid dead space thus reducing the risk of postoperative infection. Insertion of deep drainage (usually 1/8" hemovac) is used at the subcutaneous layer and the skin is closed with staples. The patient's leg is immobilized in a soft, bulky Jones dressing and/or splint. Duration of the surgery ranges from two to six hours.

Post-operative rehabilitation begins five to 10 days after surgery, following an uncomplicated recovery. Functional mobility is aimed at achieving 90 degree flexion and full extension in the salvaged limb. However many patients face temporary if not permanent limitations in their mobility which may mean an adjustment in lifestyle.

Role of the Perioperative Nurse

In tumor resection surgery our nursing practice follows standards according to the Operating Room Nurses Association of Canada and principles of orthopaedic tumor surgery based on Enneking (Enneking, 1983). Knowledge regarding instrument setups and tumor contamination principles for bone tumors are fundamental to limb salvage surgeries. Skeletal reconstruction may involve the use of donor allograft, autograft harvesting, arthrodesis with A.O. plate and screws, a total joint, free vascularized/pedicle flaps or any combination of these and other additional set-ups. Knowledge of these surgical procedures and equipment is essential for a technically successful outcome.

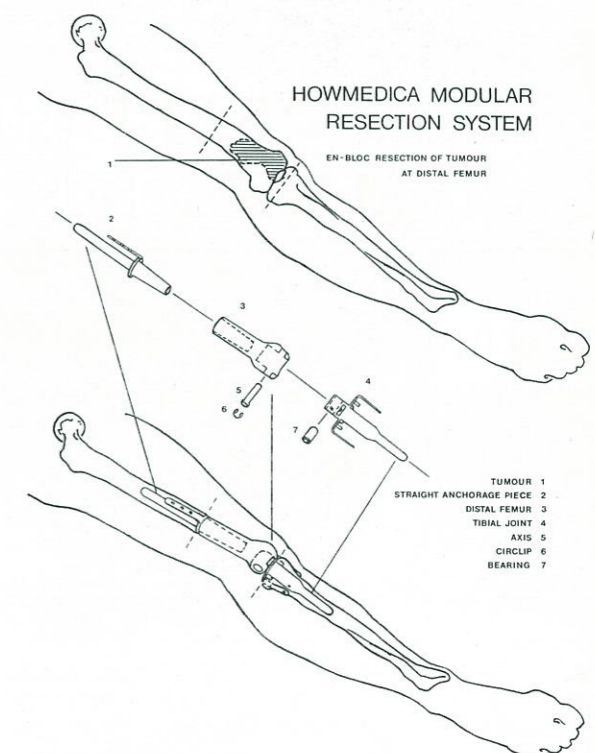
In the operating room we may see patients initially for an operative biopsy, again for porta-cath insertion, and then resection of their tumor with reconstruction. Complications, recurrence of disease and amputation are some of the set backs these patients face. The focus

of intraoperative care is based on understanding what the patient may have previously experienced or expected surgically and what stage they are at in their disease process.

Care of a patient facing limb salvage or amputation is more than a technical skill. What the patient may be going through at the time of surgery is often overlooked. Fear and uncertainty regarding alteration in body image, self-esteem, recurrence of disease, death and dying are all important considerations.

Although the perioperative nurse's initial contact with these patients may be minimal it is at a time of peak anxiety. If possible, the perioperative nurse should visit the patient before the surgery to encourage both patient and family to discuss questions related to their surgery. Pre-operative patient education may include: showing patients an implant that will replace their resected tumor and bone, familiarizing the patient with O.R. routines and a face that will be at the O.R. doors the day of their surgery. Patients may need to feel involved in preparing for their surgery. Assessment of this need is promoted through nurse to nurse consultation by the nurse on the patient unit and the perioperative nurse. An optimal level of functioning may be achieved for the patient by including them in

Figure 1



NO MATTER HOW YOU
CUT IT...



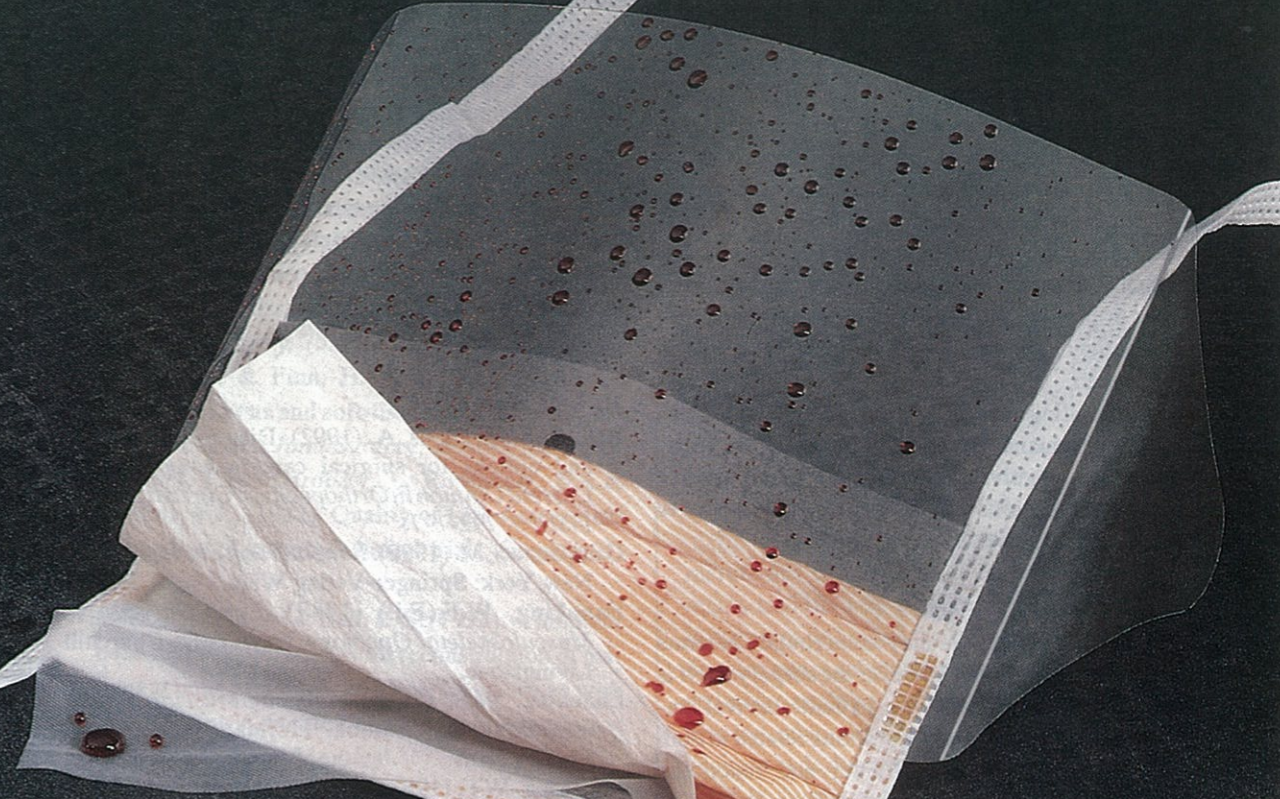
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Mount Sinai Hospital: Designated Referral Centre for Canada

Musculoskeletal tumors are rare and a small percentage of these cases present in the overall population. The University Musculoskeletal Oncology Unit, established at Mount Sinai Hospital, Toronto, is the designated referral centre for Canada. The Unit utilizes a multidisciplinary approach in the care of patients facing limb salvage surgery. The goal of this approach is to promote collaboration with colleagues in order to provide individualized, continuity of care for the patient. The perioperative nurse has a role in this approach.

Understanding the diagnostic and adjuvant therapies related to management of tumors and the initiative to become involved helps the perioperative nurse appreciate the options and rationale with respect to limb salvage surgery.

Conclusion

The outlined procedure may seem routine in terms of the surgical technique, however the surgery itself is unique to each individual. As patient survival improves the most challenging questions related to limb salvage surgery deal with efficacy and functional outcome. "Several long-term studies have confirmed that patients treated with limb salvage surgery have no higher risk of metastases than patients undergoing amputation" (Bell, 1992, p. 794). "Limb salvage surgery can potentially offer patients excellent function and cosmesis with no increased danger, but the method of reconstruction must be durable and not commit the patient to multiple surgical interventions" (Roberts, 1991, p. 767).

Measured outcome is still unknown for patients having the metallic implant described in this paper. There is a need for analysis of "reconstructive survival" which will assess the appropriateness of this system as a surgical option. The durability of this surgical choice versus other options, including amputation, will undeniably include evaluation of the patient's quality of life.

Musculoskeletal tumor surgery, an orthopaedic subspecialty, is a challenging area of nursing care. The surgical goal can best be described in the following quotation:

"The objective of modern tumor therapy is not solely the saving of life, but also an attempt to provide optimal rehabilitation for the patient whose life is saved. In the surgical treatment of osteosarcoma increased importance has therefore been attached to functional considerations" (Salzer, 1981, p. 131).

Sound knowledge with respect to surgical management, technique and technological advancement enables perioperative nurses to function as a multidisciplinary team members. But more importantly, it is a deeper understanding of patients who challenge their musculoskeletal disease that improves the nurse's ability to provide compassion and excellence in nursing care

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Fluid Replacement Therapy and Perioperative Management

By Pat Corey-Plett, RN, BN

Objectives:

- Physiology of body fluids
- Fluid therapy
- Fluid maintenance
- Fluid replacement
- Perioperative Considerations
- Conclusion

Fluid therapy during surgery is dependent upon appropriate understanding of the normal physiology of body fluids. The body is divided into two major fluid compartments:

- 1) Intracellular fluid, and
- 2) Extracellular fluid

Although these compartments are separated by membranes; water, oxygen, electrolytes and nutrients cross these barriers.

Water accounts for 45-50 percent of the body weight of adult females and 55-60 percent in adult males. The lower water content in females is due to a larger percentage of adipose tissue which contains less water than muscle.

Abstract

Fluid management is a vital component of the perioperative management of every patient. The operating room nurse should be familiar with the dynamics of body fluids and its clinical significance. Having an understanding of fluid therapy and the individual patient's needs will enhance and assist in building the teamwork approach of care with the anesthetist.

Total body water is distributed between two major fluid compartments:

- **Extracellular** (20% of body weight)
 - Interstitial
 - Circulating blood volume
- **Intracellular** fluid (40% of body weight)

The movement of water between different fluid compartments is determined by:

- **Hydrostatic pressure**
- **Osmotic pressure**

Water will move from a compartment of high hydrostatic pressure to one of low pressure.

The prime determinant of water distribution in the body. The osmotic pressure of a solution depends upon the number of molecules in the solution. Normally, intra and extracellular fluids are in an equilibrium. **Sodium (Na⁺)** is the electrolyte that acts to hold water in the extracellular space. **Potassium (K⁺)** is the electrolyte in the intracellular compartment. Cell membranes are permeable to Na⁺ and K⁺ ions which are restricted to their compartments by the Na⁺/K⁺ pump. Larger molecules such as plasma proteins, (particularly **albumin**), are confined to the circulating blood volume. Plasma proteins create a major osmotic force preventing excessive fluid loss from capillaries. This effect is called the oncotic pressure.

Author

Pat Corey-Plett is a Perioperative Nurse Clinician at St. Boniface General Hospital, Winnipeg, Manitoba. She graduated from the University of New Brunswick, BN program in 1980, and since 1981 has been working in the O.R. in various capacities. In 1992 she completed the RNAA program with the hospital's department of anaesthesia.

During a normal day, water intake equals water output.

Water loss: Insensible - vaporization from skin and lungs (12-15ml/kg) or about 900 mls in a 70 kg man. This can increase by a rise in temperature and ventilation with dry anesthetic gases and active sweating.

Urinary losses - average 1ml/kg/hr or 1600 mls in a 70 kg man.

Fecal - less than 100ml/24 hr period. The replacement of these losses can be termed the **maintenance fluids**.

Normally, daily water losses are not associated with loss of electrolytes. However, gastric suctioning, vomiting, bowel obstruction, and diarrhea may be associated with electrolyte losses which must be replaced in addition to water replacement.

Abnormalities of fluid balance can easily be categorized into three classes:

1. volume changes
2. concentration
3. composition

Volume Changes

The most common disturbances in the preoperative patient are those of the ECF compartment. Withholding fluids before surgery causes depletion of ECF because of continuous losses.

The diagnosis of severe volume depletion is demonstrated clinically by tachycardia and hypotension.

In third space loss, fluid is registered into a nonfunctional space from the extracellular compartment. This may occur with ascites, burns, massive crush injuries, and GI inflammation or obstruction.

Nonfunctional losses can also occur from surgical manipulation and tissue trauma.

Estimating fluid deficits can best be accomplished by evaluating clinical signs.

A mild deficit represents approximately 4%, a moderate deficit 6-8%, and a severe loss 10% of the body weight.

Orthostatic hypotension can occur with a deficit of 6-8%.

Signs of ECF loss are tachycardia, dry mucous membranes, hypotension, furrowed tongue, apathy, oliguria, collapsed veins, poor skin turgor, cool and dry skin, and subnormal temperatures.

Treatment is restoration of the ECF balance and adequate urinary output. Urinary output should be 30-50 ml/hr or 0.5-1 ml/kg/hr.

Concentration changes

The two primary factors involved in concentration changes are the serum sodium concentration and the serum osmolality. Concentration abnormalities can be corrected slower than volume deficits. A volume deficit is often associated with an increased serum sodium. This is due to a decrease of extracellular electrolyte free water and an increase of dissolved substances in the plasma. This can be corrected by hypotonic solutions.

Hyponatremia can occur in patients with normal, increased or decreased ECF volumes. With a normal ECF volume, the treatment is detection of the cause of sodium loss. This may develop from failure of the kidneys to conserve sodium.

Hypervolemia/hyponatremia is caused by excessive water retention. This is a concern in transurethral resections, and antidiuretic administration where water is retained. The treatment is hypertonic solutions.

Hypovolemia/hyponatremia often occurs when there is a fluid loss through the GI tract. This condition may be corrected by hypotonic solutions.

Composition abnormalities

Composition abnormalities are imbalances in electrolytes and blood gases. The electrolyte disturbance most frequently encountered in the preoperative patient is hypokalemia, which can be corrected by the administration of potassium chloride. Acid base balance should also be considered throughout the perioperative period.

Maintenance/Replacement Therapy

The selection of parental solution should be based on the needs of the individual patient. The type and amount of the solution should be carefully reviewed and estimated according to the physical status, weight, and cardiovascular status of the patient; daily maintenance requirements based on weight or body surface area; and the present fluid status of the patient.

Maintenance Fluids provide replacement of normal fluid loss such as loss via the lungs, urine, and skin. Maintenance fluids are isotonic, e.g.: D₅W, D₅NaCl 0.45.

Replacement Fluids correct an abnormal loss of isotonic fluid from the body (e.g., edema ascites).

Replacement fluids are: Ringer's Lactate, 0.9%NaCl, Plasmalyte.

The rate of fluid administration varies depending on the type of loss, severity of loss, and the cardiac and

renal status of the patient. Patients who have cardiovascular and/or renal disease will not tolerate fluid shifts as well as a healthy patient.

The majority of surgical patients have been fasting for 8-10 hours prior to surgery. Patients coming to surgery are depleted of solutes and water as a result of normal body function.

Adults should have their intravenous started before induction to replace these losses and to provide access to the circulatory system. Imbalances should be corrected before entering the O.R.

Guidelines for Routine Fluids on the Day of Surgery

1. Start I.V. - replace insensible losses with maintenance type solution e.g. D₅W, D₅NaCl 0.45
Hourly: 4 ml/kg/hr....for the first 10 kg
2 ml/kg/hr....11-20 kg
1 ml/kg/hr....21 kg and up
multiplied by the number of hours NPO

An example would be:

60 kg fe male (100mls/hr) for Total Abdominal Hysterectomy, NPO x 8 hrs = 800 mls (400 mls first hour, 200 mls the second & third) plus each hour to replace once IV insitu = 100 mls

2. Change to replacement fluid intraop.
e.g. R/L, 0.9%NaCl
60 kg = 100 mls/hr
3. Estimate surgical trauma, add appropriate volume of replacement:
- minimal: add 4 ml/kg/hr
- moderate: 6 ml/kg/hr
- extreme: 8 ml/kg/hr

60 kg x 6 = 360 mls/hr
TOTAL: first hour = 860 mls,
second & third = 660 mls

4. Give appropriate colloid solution for each volume of blood lost > 20% of EBV
(70mls/kg = 4200 mls 20% = 840 mls)

Losses: crystalloid can be used with a hct > 30% at 3 ml/1 ml of blood

5. Monitor V/S and output. Adjust fluid to urine output at 1ml/kg/hr

Intraoperative Fluid Management

Preoperatively, patients require the appropriate replacement of fluid and electrolytes to circumvent a hypotensive episode during induction of anaesthesia. The preop fluid loss can be as great as 1.5-2 ml/kg/hr for an adult (for children the loss is greater).

The ECF loss should be replaced before induction with a hypotonic crystalloid solution.

The loss of fluids during anaesthesia must be assessed. Unhumidified gases, high flows, evaporation, surgical trauma, and fever all contribute to the loss of fluids in the surgical patient.

Replacement of Blood Loss

There is a great deal of controversy as to when to replace blood loss. In a normal circumstance a person can tolerate a loss of 500 mls or 10% of the estimated blood volume (EBV). However, a loss of 15% can be considered the limit for replacement therapy.

The hematocrit level is often the indicator used for assessing the need for replacement. There is also controversy regarding this level as well. A rule of thumb for estimating allowable blood loss based on 30% hematocrit as the accepted low level.

The estimated blood volume is obtained as:

$$\text{EBV} = 70 \text{ ml/kg} \\ (\text{e.g. } 70 \text{ kg} \times 70 = 4900 \text{ mls})$$

Next we must calculate the estimated red cell mass (ERCM).

$$\text{ERCM} = \text{EBV} \times \text{preop. Hct} \\ (\text{e.g. } 70 \text{ kg, Hct } 40\% (.40) 4900 \times .40 = 1960)$$

The estimated red cell mass desired (ERCM_d) by multiplying the EBV with the acceptable low Hct

$$\text{ERCM}_d = \text{EBV} \times .30 \\ (\text{e.g. } 4900 \times .30 = 1470)$$

Allowable red cell loss (ARCL) is the difference between ERCM and ERCM_d

$$(\text{e.g. } 1960 - 1470 = 490)$$

Allowable blood loss (ABL) is twice the ARCL
(e.g. $490 \times 2 = 980 \text{ mls}$)

Keep in mind that the blood loss seen on the operative field is only a portion of the loss. One must add another 15-40%.

When replacing blood with crystalloids the rate is 3 mls for every ml of blood lost.

The advantages of using a crystalloid over a colloid are that it is less expensive, increases urinary flow, replaces interstitial fluids and it is synthetic and not derived from blood donor products. The disadvantages are that of fluid overload, improvement is short-lived and peripheral as well as pulmonary edema can occur.

Blood Products

Some blood products must be compatible with the patients blood group.

Recipients Blood Group:	Donors Blood Group:
0	0,A,B,AB
A	A,AB
B	B,AB
AB	AB

There are different blood products available which are used for specific purposes.

1. Packed Red Blood Cells 250-300mls.

Very viscous and do not transfuse quickly. Effective for chronic anemias not rapid blood loss.

To reduce viscosity add 200 mls of NaCl. To increase Hgb 1 gram, 3 ml/kg/gm of packed cells or 6 ml/kg/gm of "reconstituted" are required. Packed cells may be transfused. Packed cells do not contain platelets, albumin or coagulation proteins.

2. Fresh Frozen Plasma (FFP) 200 mls.

Plasma contains both coagulation factors and plasma proteins. It contains the clotting factors V and VIII. Stored plasma contains a limited amount of these factors. Plasma is labelled for ABO but not the RH group.

Stored plasma is effective in treating patients requiring volume expansion and protein replacement.

FFP should be administered to patients with coagulation abnormalities. It does not contain platelets.

3. Platelets 50 mls.

Unlike plasma and packed cells, platelets cannot be stored for long periods of time and must be administered within 72 hours of collection. They cannot be refrigerated after thawing.

Platelets are used for the treatment of thrombocytopenia and serum levels of 50,000/mm³ should be present to prevent bleeding during major surgery. Six units of platelets will raise the platelet count by 30,000 in a 70 kg male.

4. Cryoprecipitate 5-15 mls.

This is a concentrate of factor VIII and is effective in treating hemophilia. The administration of 1 unit/6 kg body weight will raise the factor VIII level 15-20%.

5. Albumin 50, 250, 500 mls.

The 5% solution is osmotically equivalent to an equal amount of normal plasma. The 25% solution is equivalent to five times the volume of plasma. Albumin is used as a volume expander or to replace protein loss as occurs with extensive burns or ascites.

6. Autologous Blood 300mls.

Patients can donate their own blood preoperatively. The disadvantage of this blood is the increased amount of volume provided for the amount of cells present. It is useful for bleeding in which volume is required, however it may not elevate the Hct level adequately enough on its own.

7. Synthetic colloids

There are synthetic agents available for blood volume expansion including dextran, gelatin, and hydroxyethyl starch.

All of these preparations can produce incompatibility reactions, but it is rare. The symptoms range from histamine release to anaphylaxis. These may be considered, however, in patients refusing blood products or in polycythemia and thrombocytopenia.

In summary, careful evaluation must take place to meet the individual fluid management needs of each patient. Continual assessment of hypovolemia (e.g. heartrate, blood pressure and CVP) is important as well as the maintenance of the appropriate levels of fluid intravenously. This eliminates the need to play "catch-up" and volume overload after the fact. Careful assessment of urinary output and bloodloss is important intraoperatively, as well as an understanding of the different types of fluid therapy required will enable the perioperative nurse to competently assist in the care of the patient in the operating room.

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Event Related Outdating

A Fairy Tale Comes True

By Sandy Chadwick, R.N.

O.R. Legend tells us that once upon a time, in a hospital basement far, far, away, an O.R. nurse found a package wrapped in newspaper and tied with a string beneath a pile of obsolete total hip instruments. The package bore an inscription which read, "Sterile bandages" and was dated twenty years previously. The O.R. nurse grabbed the package eagerly and took it to the Chief Wizard of the Lab, who submitted the mysterious package to all manner of tests.

Lo and behold, the package was declared to be sterile!

There was much rejoicing throughout the O.R. kingdom. There was amazement that past hospital dwellers were able to create and maintain sterility under such conditions, for this was contrary to all that the OR and CSR kingdoms held to be true. There was rejoicing, and there was wonder, but unfortunately little else, for both the OR and the CSR continued to outdate based on time related criteria. And so it has remained in most ORs and CSRs to this very day.

This is where the fairy tale ends and event related outdating begins.

Event Related Outdating

Event related outdating is based on the knowledge that items that have been properly cleaned, wrapped, sterilized, stored and handled will remain sterile indefinitely, until some event occurs that leads to actual or potential contamination of the sterile item. Event related outdating is easy and inexpensive to implement and monitor. It saves thousands of dollars in both staffing and supply costs. It decreases waste caused by the disposal or reprocessing of wrappers for sterile

goods and decreases steam and Ethylene Oxide sterilization requirements. Event related outdating does not compromise patient care or increase intra-operative risks because it does not change the existing quality assurance practices regarding sterilization and the handling of sterile goods.

Hospitals have traditionally outdated or reprocessed unused sterile goods based on expiry dates established many years ago by the wrapper manufacturers. For example, items wrapped in reusable muslin/linen wrappers, outdate in one month according to the linen manufacturers, regardless of the conditions of handling and storage. It is interesting to note that the one month timeframe has been interpreted as 28, 30 or 31 days by various hospitals. Interpretations of shelf life have been known to vary between different departments in the same institution.

Professional Standards and Recommended Practice

Although not widely practised in Canadian operating rooms and central supply departments, event related outdating is supported by several organizations.

Abstract

Traditionally ORs and CSRs have outdated reusable sterile goods at predetermined times. Professional standards (ORNAC, AORN, CSA) support event related outdating meaning that sterile goods remain sterile indefinitely unless package integrity is compromised. Significant savings in supply and labour costs can be realized without compromising patient care. The article outlines a model for the implementation of event related outdating.

The ORNAC 1993 Recommended Standards of Professional & Clinical Practice, Standard 2: Item 5.14 state "Shelf life is event related rather than time related. Dates shall be utilised as a method to rotate materials and reduce the time packages and items are exposed to factors that may result in contamination."¹

AORN Recommended Practice XI for Steam and EO Sterilization states that: "Shelf life of a packaged sterile item is event related."² and The Canadian Standards Association Standard 8.2.2 states "Shelf life is event related."³ In industry, it is common practice for vendors to print, "Contents sterile, unless damaged or opened." on sterile goods.

Implementing an Event Related Outdating System

Despite such support, and the obvious benefits of event related outdating, most ORs and CSRs continue to outdate based on date related criteria.

In order to be able to implement a system of event related outdating, the following steps should be implemented:

1. Literature Review

Conduct a literature review to become familiar with the entire topic of event related outdating.

2. Review of Decontamination and Sterilization Processes

A review of the decontamination and sterilization processes occurring in both the OR and CSR is required to determine compliance with the applicable professional standards for decontamination, packaging and sterilization. Sterility assurance mechanisms should also be in place including:

- i) Process Indicators to ensure that parameters of the processing are sufficient to cause sterilization.
 - chemical indicators i.e. labelling tapes and internal chemical indicators for all sterile packs.
 - biological indicators i.e. commercially available ampoules containing live spores for routine testing and to be included with all implants.

1. ORNAC, 1993 Recommended Professional & Clinical Standards (Canada: ORNAC, 1993), p. 39.

2. AORN, 1993 Standards & Recommended Practices (Denver: AORN, 1993), p.211.

3. CSA, Effective Sterilization in Hospitals by the Steam Process (Toronto: CSA, 1991), p.26.

- mechanical indicators i.e. sterilizer graphs and printouts.
- ii) Load numbers on the contents of each sterilizer load for potential recall situations.
- iii) Tamper Proof Locks for container systems.
- iv) Bowie Dick Test - to monitor the effectiveness of air removal from the sterilizer chamber.
- v) Routine Preventative Maintenance to sterilizers.
- vi) Regular cleaning of sterilizers according to manufacturer's recommendations.
- vii) Current Policies and Procedures reflecting professional standards of sterilization practice.
- viii) Education - on-going training conducted for OR and CSR personnel to ensure understanding and compliance with reprocessing policies.

3. Review of Transportation and Storage Protocols

A review of the transportation, storage and handling processes for sterile goods is required. AORN Recommended Practices for Steam and Ethylene Oxide Sterilization IX and X and CSA Standard CAN/CSA-Z23 14.3-M91 detail the elements of effective transportation and storage. Some key components of these standards include:

- items are covered, enclosed and protected from contamination and physical damage or loss during transportation.
- items are stored in controlled temperature, humidity and ventilation.
- there is limited access and minimal traffic through the storage area and no street clothes allowed.
- products are stored off the floor on sectioned shelving.
- items must be kept dry, vermin and dust free.
- items are adequately spaced to prevent crushing, bending, tearing or puncturing and are easily visible and retrievable to prevent damage to the wrapper or label.
- inventory control measures are implemented to ensure that stock is rotated such that oldest stock is utilised first.

Author

Sandy Chadwick is Team Leader OR/PACU at York Central Hospital in Richmond Hill, Ontario. The author wishes to acknowledge the assistance of Sheila Arnston R. N. in the development of this project.

4. Review of Handling of Sterile Goods

Nursing and technical personnel should adhere to the AORN Recommended Practices for Aseptic Technique III: "All items presented to the sterile field should be checked for proper packaging, processing, moisture, seal integrity, package integrity and the appearance of the sterilization indicator."⁴The amount of handling a sterile item undergoes should be minimized.

Steps three (3) and four (4) identify the events that may lead to contamination of sterile goods. Attempts should be made to prevent the problems identified in compliance with the standards.

5. Culture & Sensitivity Testing of Outdated Items

Case studies reported in the literature regarding the culturing of expired items, have demonstrated that items that have exceeded their expiry date for as long as seven years, have remained sterile.⁵

If expired items in intact packages can be located (and most OR have at least a few), conduct C&S testing on the items. Sterility maintained beyond the expiry date supports the implementation of event related outdateding.

6. Cost/Benefit Analysis

i) Determine the current costs of supplies and labour to complete date based outdateding. Chart 1 provides a sample worksheet which can be used to estimate the annual costs.

York Central Hospital operates five to six ORs, performing 8,200 surgical cases annually. Based on this formula, our expected savings in labour and supply costs due to the implementation of event related outdateding in the OR alone will be \$5,800. The savings reported in the literature have been \$20,000+.

ii) Determine the cost in supplies and labour to monitor event related outdateding.

At York Central Hospital, we have decided to use

4. AORN, 1993 Standards and Recommended Practices, (Denver: AORN, 1993), p.101.

5. Arlene Donovan, David W. Turner and Arthur Smith, "Successful, documented studies favouring indefinite shelf life", *Journal of Healthcare Materiel Management*. March (1991), 37-40.

two systems to monitor the event related outdateding system:

- a) a random audit of ten items monthly to ensure proper stock rotation and conditions of storage
- b) C&S testing of five items per month randomly selected throughout the O.R., packaged in:
 - ready-made paper envelopes heat sealed in OR
 - paper wrappers
 - linen wrapped in the two most frequently used sizes
 - container

iii) Determine the cost of any training or education required to implement event related outdateding.

We estimate that these activities will require less than one-half hour of technical aide time monthly, or less than \$100 annually. The Lab has estimated that the costs arising from the C&S testing are negligible and can be easily assumed by Lab personnel without an increase in the supply or staffing budgets.

New labels will be required to be placed on sterile goods declaring that the item is sterile indefinitely, unless package integrity is damaged. Contact a representative from the company providing your chemical indicators and other sterility process supplies to determine the availability and costs of these labels. We have obtained labels from 3M Canada Ltd. at the same cost as the current load indicator labels, so we will not incur any incremental costs.

7. Seek Support from Key Users

Armed with the professional standards, results of your literature review and the C&S testing combined with your Cost/Benefit Analysis, seek support from key individuals/departments throughout the institution:

- Infection Control Practitioner and Infection Control Committee
- Manager of CSR/SPD
- OR Nursing and Technical personnel
- OR Committee, Chief of Surgery, Program Directors

Submit a formal proposal to the Senior Management Committee. Be prepared for this information to be shared with the Medical Advisory Committee and the Board of Trustees, as required by your institution's policies.

A Point of Discussion: Sterility Maintenance Covers

The AORN states: "The length of time an item is considered sterile depends on factors that include the:
- type and configuration of packaging materials
- number of times a package is handled before use
- storage on open or closed shelves
- conditions of the storage area (e.g. cleanliness, temperature, humidity)
- use of dust covers and method of seal."⁶

There are no specific guidelines regarding what items should be placed in dust covers, how the dust covers should be sealed or their duration of use. The manufacturer of the dust cover states that sterility will be maintained indefinitely providing the dust cover's integrity is intact. For properly prepared, handled and stored sterile goods, a dust cover is redundant and not cost-effective.

This has been clearly demonstrated by the studies that have already proven that properly handled items are sterile indefinitely providing package integrity is intact, without dust covers. At least one other study of fifty weeks duration, has shown that sterility was not impacted by the use of dust covers.⁷

Dust covers will not be routinely utilized in the O.R. at YCH. The number and type of items that remain unused for one year will be monitored. These items will be evaluated to determine if they should remain sterile, need to remain in stock unsterile or should be deleted from inventory. This action will improve inventory control and may result in space savings, a benefit to any Operating Room Suite.

6. AORN, p.211.

7. William E. Butt and others, "Evaluation of the Shelf life of Sterile Instrument Packs," *Journal of Oral Surgery, Medicine&Pathology*, 72(1991), pp.650-654.

Summary

The legend has a happy ending. Event related outdateding does not need to remain a fairy tale. It is easy to implement and monitor. It does not compromise patient care and is supported by professional standards. It can save the OR and CSR thousands of dollars in supply and staffing costs, money and labour that can be redirect to providing optimal patient care. It is this type of reengineering of traditional systems that can provide the savings necessary to remain fiscally viable in the current cost cutting climate. Event related outdateding can become reality in any O.R.

Chart 1

York Central Hospital Annual Cost of Existing Outdating System

A) Reprocessing Labour Costs

hours/year average annual cost
to outdate x hourly rate = reprocessing

B) Restocking Labour Costs

#hours/year average annual cost
to restock x hourly rate = restocking

C) Reprocessing Supply Costs

1. Determine the number of items outdated annually
2. Calculate the percentage wrapped in linen, peel pack and paper wrappers.

(i) Linen*
% of total items reprocessed annually x
cost of wrappers

(ii) Peel Pack*
% of total items reprocessed annually x
cost of peel pack

(iii) Paper wrappers*
% of total items reprocessed annually x
cost of wrappers

3. Include the cost of external and internal chemical indicators.

* May need to be calculated for each size of wrapper under (i), (ii) and (iii) based on individual OR's style of wrapping. Include additional wrapping supplies such as towels, instrument tip protectors.

D. Costs of Sterilization


loads/year x cost/load

Total Reprocessing Costs = A + B + C + D
= Potential Annual
Savings of Event
Related Outdating

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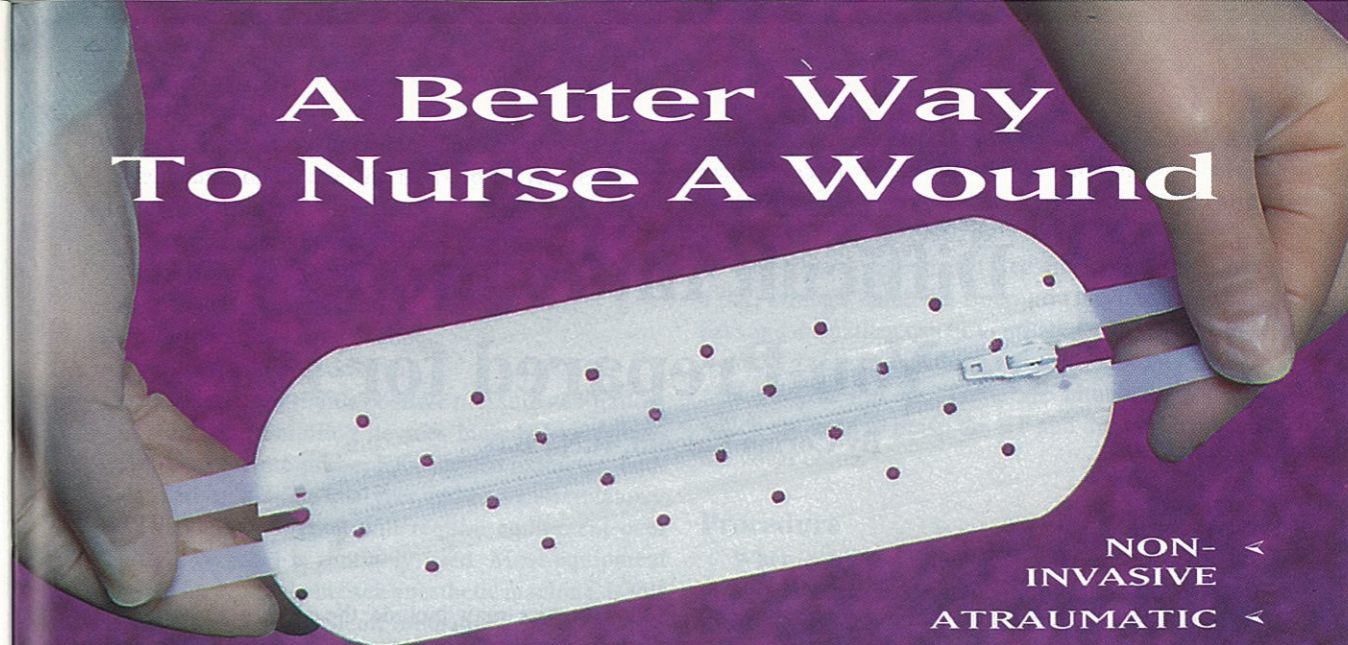
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Difficult Intubation Are You Prepared for It

By Corina Balcom, R.N., B.N.

The perioperative nurse who supports the anaesthetist (often the circulating nurse) during surgical cases, requires advanced knowledge and skills to perform this function adequately. A duty of this person is to help the anaesthetist in airway management during all situations. One situation which can exist is that of difficult intubation.

Assessment

Difficult intubation results when the anaesthetist has difficulty, for any number of reasons, placing an endotracheal tube (ET). There are times when this situation can be anticipated. In the pre-operative assessment carried out by the anaesthetist, indications of trouble may be apparent. Examination of the patient can display some of the anatomical characteristics that can complicate intubation as described by Stoeling (1986), "A short muscular neck with a full set of teeth, a receding mandible, protruding maxillary incisor teeth, poor mandibular mobility and a high arched palate associated with a narrow mouth" (p. 524). These anatomic situations prevent poor alignment of the oral, pharyngeal, and laryngeal axis. Without this alignment, the glottis cannot be visualized adequately.

Abstract

The endotracheal intubation of a patient for surgery requires an anaesthetist who is aided by a skilled and experienced helper. This paper explores reasons why some patients are difficult to intubate. Some are predictable on pre-operative assessment and others are not. Suggestions are given on how the helper is useful to the anaesthetist in this potentially critical situation.

Other factors may include the size of the tongue, obesity, neck contractures, and prominent pharyngeal tonsils, adenoids), especially in children.

Pathology can also lead to the problem of difficult intubation. Some of these disorders include retropharyngeal masses, fixed neck and hoarseness due to rheumatoid arthritis laryngeal cancer, and mediastinal mass (Shorten, 1991). Decreased mouth opening may be caused by tempero-mandibular joint pathology.

If the patient has been intubated on a previous occasion, and difficulty was encountered, this should be recorded in his/her medical records. The patient should also be aware and has a responsibility to inform those persons who do pre-operative assessments.

When trouble is anticipated a plan for action can be formulated in collaboration with those personnel involved with the surgical procedure. This may include the surgeon, assistant to the surgeon and anaesthetist, scrub nurse and nursing supervisor. This alerts key people in the event that further help is required.

At times the indicators are evident, however, often a difficult intubation cannot be anticipated. For this reason the anaesthetist's helper must be prepared for this during each surgical procedure where endotracheal intubation is planned.

Author

Corina Balcom, R.N., B.N. is a Staff Nurse in the Operating Room/Recovery Room at the Miramichi Facility of Region 7 Hospital Corporation, Newcastle, New Brunswick. She is currently President of the New Brunswick Operating Room Nurses Association and an ORNAC Standards Committee member.

Equipment

Equipment for endotracheal intubation varies and is dependant on the anaesthetist's choice. However, the following are always needed:

- proper sized endotracheal tubes,
- appropriate anaesthetic drugs and neuro-muscular blockers,
- functioning laryngoscope,
- functioning suction, and
- facilities to provide positive pressure ventilation.

Routine monitoring devices include blood pressure, temperature probe, EKG, pulse oximeter, end-tidal carbon dioxide analyzer, and nerve stimulator.

Difficult intubation will require equipment over and above what is routinely used. Most equipment should be available in each anesthetic machine. If this is not feasible a "Difficult Intubation" cart is recommended. The following is a list of additional equipment and their uses:

1. Various types and sizes of laryngoscope blades.

"The three basic types of blades are the curved (McIntosh), the straight blade (Jackson or Wisconsin), and the straight blade with curved tip (Miller). Advantages cited for the straight blade include a greater exposure of the glottic opening permitting observation of the tube as it passes through the glottic opening and less need for a stylet to direct the tube into the anterior larynx. Advantages cited for the curved blade include less trauma to teeth and more room for passage of the tracheal tube through the esophagus, less bruising of the epiglottis since the blade tip should not touch the structure and decreased incidence of coughing and laryngospasm" (Stoeling, 1986, pg. 536).

2. Stylets. These are flexible wires placed in the endotracheal tube to facilitate directing the tube anteriorly. Stoeling (1996) explains, "When properly shaped, the tracheal end of the tube should resemble a hockey stick" (pg.535).

3. Fiberoptic laryngoscope or bronchoscope. Cole (1993) tells us that, "Fiberoptic intubation is a valuable technique in management of the difficult airway" (pg. 469). This instrument is threaded onto an appropriate size ET and allows for visualization of the larynx. When the larynx is viewed, the fibroscope is passed through the vocal cords and the ET is advanced using the scope as a guide.

4. Oral Airway Intubator. "This is a plastic oropharyngeal airway with a cylindrical passage that permits passage of the tracheal tube containing the fibroscope" (Stoeling, 1986, pg.539)

5. The laryngeal mask. "The laryngeal mask airway is intermediate in design and function between an oropharyngeal airway and a tracheal tube" (Maltby, Loken, & Watson, 1990, pg. 509).

6. A special anaesthetic face mask. This mask has a port through which the fiberoptic laryngoscope can pass and the patient can be ventilated at the same time.

7. 14 gauge intercath or cryothyroidotomy kit.

8. McGill forceps. These are intubating forceps which are used to grasp the ET and direct it between the vocal cords.

Procedure

When equipment and personnel are in place the patient is readied for intubation. Baseline findings from the monitors, prior to the beginning of induction, are obtained and recorded. If the anaesthetist has elected to attempt an awake intubation, the patient's cooperation and permission are essential. Awake intubation is advantageous because the patient is able to help the anaesthetist by swallowing secretions, phonating or panting. The anaesthetist should spend time with the patient to explain the procedure and develop a trusting relationship. In collaboration with the anaesthetist, nursing personnel should include information on awake intubation during their pre-operative teaching.

Local anaesthetic and sedation will be the anaesthetists' choice but Cheng et al (1993), in their clinical study, relate the drugs used for awake intubation as, "premedication of glycopyrrolate (0.2 mg. IM), midazolam (15 ug/kg IV), and fentanyl (0.75 ug/kg IV)...topical anaesthetic with 10 ml of 4% lidocaine to the upper airway followed by transtracheal block of 2 ml. of 2% lidocaine" (pg.A29).

As intubation is attempted, additional help may be required. The surgeon and the scrub nurse may be required to do any of the following tasks:

1. Draw up and administer IV or local anaesthetic medication.

2. Position and reposition the head. Stoeling (1986) describes proper head position for intubation, "successful direct laryngoscopy requires aligning the oral, pharyngeal, and laryngeal axis such that the passage-way from incisor teeth to glottis is most nearly a straight line. Elevating the head about 10cm. with pads under the occiput (shoulders remain on the table) serves to align these axis...adjustment of the table to the level of the anesthesiologists xiphoid cartilage" (pg. 528).

3. Placement of a stylet in ET.
4. May be required to ventilate with special mask in place while the anaesthetist is placing fiberoptic scope.
5. Perform the "BURP" manoeuvre. Knill (1993) describes this, "My hypothesis was that in some cases of difficult laryngoscopy, the view of the glottis could be improved by manually displacing the larynx in three specific directions - i.e. (1) posteriorly against the cervical vertebrae, (2) superiorly as far as possible and (3) slightly laterally to the right.

This combination of displacements can be produced by exerting backward, upward, and rightward pressure on the thyroid cartilage. The components of the manoeuvre can be remembered by the acronym BURP". With all three displacements maintained, laryngoscopy is performed and the endotracheal tube placed in the trachea" (pg.279-280).

Failed Intubation

In the event of failed intubation, further measures are necessary. If the intubation has been an awake attempt, it is necessary to inform the patient of the situation. The surgery may be rescheduled with a further plan for airway maintenance during surgery. This may even include insertion of a tracheotomy tube under local anaesthetic.

If the patient has been induced with IV medication and relaxants, assisted ventilation will be required until the effects of such drugs have worn off and the patient is awake enough to breath spontaneously. One also must consider the patient who is suffering the effects of anaesthetic drugs whose airway is further compromised by an obstruction. If it is impossible to ventilate and respiratory collapse is imminent, "prolonged attempts at orotracheal or nasotracheal intubation should be avoided. If orotracheal intubation is not successful after one or two attempts, cricothyroidostomy should be done" (Holcott & Wisner, 1991 pg. 198). Donlan (1986) explains, "this technique enters the trachea directly thru an incision in the cricothyroid membrane at the third tracheal ring. Cricothyroidotomy is a safe, simple life-saving procedure whereby an airway can be established in 1 or 2 minutes in emergency situations" (pg. 1875).

To adequately assist the anaesthetist in any of the previous mentioned situations, the person who helps the anaesthetist must be familiar with the anatomy of the neck, be comfortable in positioning and repositioning structures that facilitate intubation and know where all additional equipment can be found. As

Abbott (1990) explains, "the perioperative nurse must be able to anticipate the potential for intraoperative emergencies to plan and intervene effectively" (pg. 479). In short it requires an individual with experience and advanced knowledge and skill about anaesthesia to be prepared to give the patient quality care in all situations.

Conclusion

Whenever the patient requires endotracheal intubation the potential for minor, major or life threatening complications of that procedure must be kept in mind. Having equipment available and experienced personnel to assist the anaesthetist will provide the support staff needed for a positive outcome.

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Newfoundland/Labrador Celebrate 15th Anniversary

During this year's Newfoundland and Labrador Operating Room Nurses Conference held in Gander, Newfoundland, September 29th to October 1st, 1994, two events took place to mark the development and celebrate the history of the organization. The OR group celebrated their 15th anniversary and the membership was presented with an official flag.



Photo above: (left to right) An anniversary cake is cut by N&LORNG presidents. Current President Lil Budden, past presidents Anne Hughes and Sylvia Hiscock, and immediate past president Angela LeMoine.

Photo Left: (left to right) Lil Budden and Angela LeMoine present the membership with the new N&LORNG official flag.



Dates to remember.....

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ORNAC Teleconferences Scheduled for Operating Room Nurses

The Operating Room Nurses Association of Canada has planned a series of Teleconferences on a number of Operating Room Nursing Topics. The Spring 1995 sessions begin **February 15, 1995**. The time for all Teleconferences has been set at 1:10 Eastern Time. Thus, participants must adjust to their time zones. Interested participants/groups are asked to contact Telemedicine Canada at **(416) 599-1234** to book programs.

Date	Topic	Speaker	Moderator
Feb. 15 Wednesday	Surviving as a Nurse/Manager Factors Applicable to OR Nurses	Lorraine Varner	Sharon Ball
Mar. 8 Wednesday	Laparoscopic Nephrectomy	Dr. Eric Freedman Dr. Michael Morse	Charlene Robinson
Apr 12 Wednesday	Perioperative Nursing and Anesthesia: A Manitoba Experience	Jacob Kress Pat Corey-Plett	Sahmee Roux
May 3 Wednesday	Ethics of Organ Retrieval	Ann Secord	Jean Reid
May 24 Wednesday	Substance Abuse in Nurses Its Identification and Treatment	Dr. Graeme Cunningham	Margaret Cassidy
June 14 Wednesday	Perioperative Performance Appraisals - VGH Experience	Mirilla Furlan Sunny Russell	Dahlia Robinson

Speaker Profiles

Lorraine Varner, BScN, MEd., President, British Columbia Operating Room Nurses Group is Patient Care Director, Surgery/Maternity/Pediatrics, Kelowna General Hospital, Kelowna, B.C.

Dr. Eric Freedman, MD, FRCS (C) Consultant in Pediatric and Adult Urological Surgery, Greater Victoria Hospital Society.

Dr. Michael Morse, MD, FRCS (C), Urologist, Saint John, N.B.

Jacob Kress, RN, Perioperative Nurse Clinician, and **Pat Corey-Plett**, RN, BN, Perioperative Nurse Clinician, St. Boniface General Hospital, Winnipeg.

Ann Secord, RN, Transplant Coordinator, Inspector of Anatomy, Saint John Regional Hospital, Saint John, N.B.

Dr. Graeme Cunningham, MD, FRCPC, Director, Homewood Alcohol and Drug Service, Guelph, Ontario, and Assistance Clinical Professor of Medicine, McMaster University, Hamilton, Ontario.

Mirilla Furlan, BScN, Unit Supervisor, 11A OR, and **Sunny Russell**, RN, Head Nurse Cardiovascular OR, Victoria General Hospital, Halifax, N.S.

Teleconference Moderators

Sharon Ball, RN, President-Elect Operating Room Nurses Association of Ontario, Quality Coordinator, Mount Sinai Hospital, Toronto, Ont.

Charlene Robinson, RN, Unit Manager, OR, Cape Breton Regional Hospital Society, Sydney, N.S.

Sahmee Roux, RN, Staff Nurse, Lachine General Hospital, Lachine, Que.

Jean Reid, RN, Staff Nurse, York County Hospital, Newmarket, Ont.

Margaret Cassidy, RN, BN, Staff Nurse, OR/RR, Region 7 Hospital Corporation, Miramichi Facility, Miramichi, N.B.

Dahlia Robinson, RN, President, Operating Room Nurses Association of Alberta, Clinical Coordinator, OR Ophthalmology/Otolaryngology, University of Alberta Hospital, Edmonton, Alberta.

Contact
Telemedicine Canada
at **(416) 599-1234**
to book programs.

World Conference of Operating Room Nurses - IX Hamburg, Germany September 10-15, 1995

Theme: "Touching Lives and Building Futures"

The International Planning Committee, an advisory group made up of representatives from Australia, Austria, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, Spain, Switzerland, United Kingdom, and the United States, met to discuss issues, concerns, and new developments affecting operating room nursing practice worldwide. From this lively and exciting interaction, topics have been identified for World Conference IX. Gloria Stephens as past-president of ORNAC, represented Canada on this international planning committee. The topics selected for the World program in Hamburg include:

- Measuring Quality
- Intercultural Issues
- Ecological Philosophy and Practice
- Managing Difficult Situations
- Scope of Perioperative Nursing
- Day Surgery/Outpatients
- Alternative Therapies
- Going to Work and Loving it!

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Waist	26-29	30-33	34-37	38-41
Hips	36-39	40-43	44-47	48-51

Registration Information

For program details, Hamburg tourism information, accommodation and registration forms write to:

Association of Operating Room Nurses, Inc.
World Conference
of Operating Room Nurses -IX
Attn: Customer Service
2170 S. Parker Road, Suite 300
DENVER, Colorado, USA
80231-5711

Phone (303) 751-0337 Fax (303) 750-3212

International Fellowship Night

Canadians traditionally attend Fellowship Night in the same attire. Chosen for this conference is a red sweatshirt with the ORNAC logo and a Tilly Hat. Order the sweatshirt from Lac Mac Limited and the hat from Gloria Stephens.

Please indicate as soon as possible to Gloria Stephens or your Provincial President that you plan to attend so that orders can be placed.



1994 ORNAC/J&J Bursary Awards

The recipients of the ORNAC/Johnson & Johnson Medical Products Bursary for 1994 are:

Joan Donald,

Director of Ambulatory Services,
The Moncton Hospital, Moncton, N.B.
Award- \$1,000

Sunny Russell,

Head Nurse, Cardiovascular Surgery,
Victoria General Hospital, Halifax, Nova Scotia.
Award - \$2,000

Elizabeth Kent,

Staff Nurse, Operating Room,
Dr. Everett Chalmers Hospital,
Fredericton, New Brunswick.
Award - \$2,000

Joan Donald's dedication to the field of perioperative nursing spans a period of thirty years during which she has served as a role model of excellence for every perioperative nurse who had the good fortune to know her. She has been an able ambassador for the practice of perioperative nursing at the national and international level.

Joan was actively involved in the formation and growth of the Operating Room Nurses Association of Canada and is distinguished as a Past President of ORNAC and as a recipient of the Johnson & Johnson Medical Products Drake-Thompson Editorial Award. Joan is presently studying at University of Toronto School of Graduate Studies for her Doctorate in Education.

Sunny Russell is currently enrolled in the Bachelor of Science in Nursing program at Dalhousie University, Halifax, N.S. During her nursing career she has gained experience in several areas of nursing practice. She has worked as a staff nurse in the Respiratory Unit, IWK Children's Hospital; ICU Surgical Nursing Unit at the Camp Hill Hospital and in Psychiatry at the Abbie J. Lane Hospital, Halifax, N.S.

Sunny plans to continue to work in the area of perioperative nursing and believes that the education she is pursuing will better enable her to meet the challenges ahead in the health-care field.

Elizabeth Kent is a staff nurse in the OR at Dr. Everett Chalmers Hospital, Fredericton, N.B. She graduated from the Saint John General Hospital School of Nursing in 1968 and with the exception of one year in Surgical Intensive Care has worked exclusively in the field of perioperative nursing.

Elizabeth is the Past President of the New Brunswick Operating Room Nurses and served as a member of the ORNAC Board of Directors. She was chair of the ORNAC Awards Committee and a member of the ORNAC Bylaws Committee. After completing her Bachelor of Nursing degree at the University of New Brunswick, Elizabeth plans to continue to work in the area of perioperative nursing and to continue to act as an advocate of perioperative nursing. ■

OR Bursary

The ORNAC/Johnson & Johnson Medical Products Bursary is offered to financially assist members of the Operating Room Nurses Association in Canada (ORNAC) in furthering their education in areas that will enhance perioperative nursing practice.

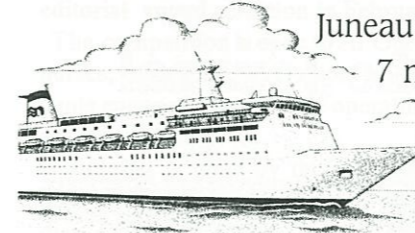
Applications are invited by ORNAC for 1995. Deadline for submission in **March, 1995**. Bursary application forms are available from Provincial Presidents and printed in some provincial newsletters. Submit your application to:

Shelly Zareski
Chairman Awards Committee
5572 North Ridge Road, #1206
Halifax, Nova Scotia
B3K 5K2
(902) 454-0463

Shelly Zareski is President of the Operating Room Nurses Association of Nova Scotia, thus is an ORNAC Board Member. She serves as chairman of the ORNAC Awards Committee in 1995. Shelly is Charge Nurse, Izaak Walton Killam Hospital for Children, Halifax, Nova Scotia.

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The Operating Room Nurses Association of Canada 14th National Conference



May 8 - 12, 1995
Vancouver Trade & Convention Centre
& Pan Pacific Hotel

An outstanding educational program in a beautiful city! Great Exhibits! Lots of Entertainment! Lots of Fun! See pages 38 and 39 for details and the Official Housing Bureau Form. Look for more details in the February/March, 1995 issue.

How to submit an article to the Journal

The Canadian Operating Room Nursing Journal is intended to serve the information needs of perioperative nurses in hospitals and clinics throughout Canada. Readers include staff nurses, technicians, head nurses, nursing supervisors, coordinators, clinical instructors, directors of nursing and many other speciality nurses including post-anaesthetic recovery room nurses. The journal is peer-reviewed and published quarterly by Health Media Incorporated under the aegis of the Operating Room Nurses Association of Canada (ORNAC).

Manuscripts are reviewed by the editorial board members appointed by ORNAC, and when necessary by outside experts. Submissions are invited on new surgical techniques, descriptions of new technologies or advising of new programs and educational material. Selection is based chiefly on the following criteria: originality, timeliness and relevance to the needs of the journal's readers.

Preferred length is approximately six to ten typed, double-spaced pages, numbered consecutively throughout (including tables, figures, references, which should be on separate pages). Authors should submit three copies (one should be the original or an excellent photocopy) of the manuscript and include:

1. An abstract summarizing the article.

2. An autobiographical statement that includes the author's full name, current title and academic qualifications. e.g. Jane M. Smith, RN., M.N.; is head nurse, Thoracic Surgery Unit, General Hospital, Perth, ON.

All illustrations, graphs, tables, etc. should be clearly labelled and, if necessary, reference should be made as to where they are to be inserted in the text. The author should submit the original manuscript and two(2) copies for reviewers. A copy of the edited text will be sent to the author for approval.

References are arranged in alphabetical order by author surname. References are cited in the text by author-date method of citation, e.g. (Smith, 1987). Follow the APA Manual for style when typing the list of References, eg.:

Benjamin M. & Curtis, J. (1986). *Ethics in Nursing* (2nd ed). New York: Oxford University Press.

Smith, G. (1987). *Opportunities for nurse entrepre-*

neurs. Nursing Outlook 35(4), 182-184.

Share your knowledge, expertise and experience with your operating room nursing colleagues across Canada and those nursing in the U.S. and foreign countries.

Address all correspondence to:

**The Editor,
Canadian Operating Room Nursing Journal
c/o Health Media Inc.
14453 29A Avenue
White Rock, B.C., V4P 1P7
Phone (604) 535-7933
FAX: 604-535-9000**

Please allow six weeks for the acceptance and review of your manuscript. Authors will receive a letter from the publisher on receipt and a follow-up letter announcing acceptance and possibly some revisions suggested by the editorial review board.

Manuscripts submitted to the Journal should not be submitted to another publication or newsletter while under review or awaiting publication.

Editorial Award for Authors now valued at \$3000

In 1983 with launching of the "Canadian Operating Room Nursing Journal", Johnson & Johnson Medical committed an annual \$2,500 award to the journal. Today's award is valued at \$3,000. The award recognizes Canadian nurses who contribute to the advancement of perioperative nursing knowledge and education of their colleagues through the medium of the Journal.

The Editorial Awards Committee was established under the chairmanship of Muriel Shewchuk of Alberta. The first award was presented at the National Conference in Jasper in 1984. The recipient receives a plaque as well as the cash award which is adminis-

tered by ORNAC. The 1995 chairman is Shelly Zareski of Halifax, N.S. The committee will make their '94 editorial award selection in February, 1995.

The competition is open to all Operating Room staff nurses, managers, instructors and technicians. Students engaged in post basic operating room programs are also eligible.

Judging is done by the Awards Committee - on eligible articles that have been published in the Canadian Operating Room Nursing Journal during the calendar year. The awards presentation is done at the National Conference or at a provincial conference, on the choice of the winner.

The Johnson & Johnson Medical Products Drake-Thompson Memorial Award is in memory of the untimely deaths in 1983 of J&J managers, Chris Drake and Gregory Thompson.

Loretta Thomas-Aasen has resigned from ORNAC

Loretta Thomas-Aasen of Weyburn, Saskatchewan has resigned for personal reasons as President-Elect of ORNAC. The announcement was made at the Board Meeting, October, 1994 in Toronto.

In correspondence with Gloria Stephens, Past-President of ORNAC, the Journal learned that

Loretta served on the ORNAC Board for several years representing the nurses of Saskatchewan and as the provinces' delegate served that province "beyond the call of duty". She worked on numerous ORNAC board committees and "her input was always timely and complete". Most recently Loretta was chairman of the Research Committee and served on the Editorial Board. Her many efforts as a reviewer and writer for the Journal were substantial and greatly appreciated.

The ORNAC Executive and board have expressed their appreciation for her fine work and wish her well in her future endeavours.

Vija Hay nominated President-elect

Vija Hay of Ottawa was nominated to be president-elect of ORNAC at the same board meeting. The office of President will be assumed in May, 1995 at the National Conference in Vancouver.

Vija Hay is Director of Nursing, Surgical Services, Queensway Carleton Hospital, Ottawa. She has served on the ORNAC Board in several capacities over the years and recently as Vice-President of ORNAC. Vija is the immediate past-president of the Operating Room Nurses Association of Ontario. She comes to this new position on the ORNAC Board with a great deal of experience in many areas of operating room nursing which will be invaluable to the membership and the practice of perioperative nursing.

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The Operating Room Nurses Association of Canada
14th National Conference



May 8 - 12, 1995

Vancouver Trade & Convention Centre
Headquarter Hotel - Pan Pacific Hotel

An Education Program offering outstanding speakers/ Great Exhibits/ Cruise to Alaska following the Conference/ Lots of Entertainment/ Lots of Fun !

An educational program offering: • Outstanding speakers • Great exhibits • Cruise ship to Alaska • Lots of Entertainment • Networking opportunities with perioperative nurses....and all of it takes place in one of the world's most beautiful cities at the warmest and sunniest time of the year.

Preliminary Program Preview

Keynote Speaker: **Dr. Jane C. Rothrock**, Professor of Perioperative Nursing, currently president of the Association of Operating Room Nurses Inc., Denver, Co.
Changing Role of the Front Line Manager - **Margie Fullerton**. Reproductive Technology - **Patricia Baird**. Transplantation - Questions of Life - **Sue Howard**. R.N. as 1st Assistant - **Dr. Jane Rothrock**. Ethical Dilemmas in the OR - **Patty Rodney**. Transplant Patients - Quality of Life - **Sue Howard**. Spinal Surgery - **Marcel Dvorak**. Menopause - **Vera Frinton**. Demystifying Research - **Shirley Thorn**. Sterilization - What's Hot? **Lorna Murphy**. Anesthesia Physiology - **Bruce Prasloski**. Sacred Cows - **Lorraine Varner**. Plus:
Trauma Management • Latex Allergy
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Prostate Cancer • Chemical Dependency
Changing Face of Ambulatory Care
Expanded Role of the Perioperative Nurse
Fire Safety • Dealing With Change
Women Working with Women
Debriefing for Grief - Post Organ Retrieval
Male Menopause • Surviving Education
Recycling - Production to Disposal
Health Care Economics - **Jane Fulton**, and closing speaker **Joan Donald**.

14th National Conference
Centre de commerce et des Congrès
et Hôtel Pan Pacific
Vancouver, B.C.
8 au 12 Mai, 1995

Sessions Educatives:

1. Le rôle changeant de la gestion de première ligne
2. La technologie de reproduction
3. Les dilemmes d'éthique
4. La qualité de vie chez les patients transplantés
5. La chirurgie spinale
6. L'allerie au latex
7. L'infirmière assistante à l'anesthésie
8. La gestion des urgences
9. La dépendance chimique
10. Démystifier la recherche
11. Le sang réchauffé dans les cardioplogies
12. Survivre à l'éducation
13. Physiologie en anesthésie
14. Le cancer de la prostate
15. Recyclage - De la fabrication au jetable
16. Compte rendu d'une situation douloureuse..... et plus encore

- Beaucoup d'activités et de plaisir
- Des exhibitions super intéressantes
- Croisière en Alaska après le congrès - prix spéciaux pour les délégués

Pas toutes les sessions seront traduit

Watch for the February/March, 1995 issue of the *Canadian Operating Room Nursing Journal* for full details on the '95 National Conference. Plus the list of Entertainments & Exhibits!

**ORNAC's
Official Housing Form**

Please fill out this form completely and mail or Fax to: (604) 683-2601

Operating Room Nurses of Canada
Housing Bureau
c/o Tourism Vancouver
200 Burrard Street, Suite 210
Vancouver, B.C.
V6C 3L6

We recommend you communicate by FAX, however if you need to phone, please call for information and rates only to: (604) 683-2772

Instructions and Information

- All reservations must be received in Vancouver by **March 24, 1995**. After cut off date please telephone hotels directly.
- **Tourism Vancouver** will acknowledge receipt of your request and deposit by mail. Confirmation of your hotel will be made directly by the hotel.
- All rooms will be assigned on a first come, first served basis. Make your reservations early to avoid disappointment.
- Reservations must be secured with a credit card guarantee.
- If more than one room is needed, additional forms must be submitted, one for each room.
- Until cut off date, charges or cancellations may be made with Tourism Vancouver. After cut off March 24, 1995, please contact the hotel directly.

Hotel:	Single:	Double Twin:	Extra person:
Pan Pacific Hotel	\$170	\$170	\$30
Waterfront Centre	\$159	\$159	
Vancouver Renaissance	\$159	\$159 (Harbor View)	\$25
Vancouver Renaissance	\$139	\$139 (City View)	\$25
Hotel Vancouver	\$140	\$155	\$15
Hyatt Regency	\$155	\$155	
Hotel Georgia	\$ 95	\$105	\$20
Days Inn Hotel	\$ 95	\$110	\$10
Landis Hotel Suites	\$ 70	\$ 75	\$10

Note: All rates are quoted in Canadian funds. Rates do not include 10% Room Tax and 7% GST. (GST refund forms will be available to non-Canadian residents at hotels upon request. Revenue Canada will issue rebates.

Please Make the Following Reservations
Reservation/Guest Name: _____

Number of Rooms: _____

Additional Occupants of Rooms: _____

Arrival Date: _____ Time: _____

Departure Date: _____

Hotel: (Select from list provided)

1st choice: _____

2nd choice: _____

3rd choice: _____

Room Occupancy: _____ 1 person

: _____ 2 persons

: _____ 1 bed : _____ 2 beds

Special Requests: (non-smoking, disabled etc.)

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Address: _____

City: _____

Postal Code/Zip: _____

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