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Volume 7, Number 1, February/March, 1989

UNITING FOR THE *future*

1st Biennial Conference
Operating Room Nurses
Association Of Ontario
Constellation Hotel
Toronto, Ontario
April 24 – 26

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Feature Articles

Departments

Advertisers Index

Total knee arthroplasty and revision

By Rick Harburn, R.N.A.

Total knee arthroplasty first began in the 1940's, but its current state of development has really only taken off since the early 70's. Today there are hundreds of different models of artificial knee joints on the market. Even so, the art of total knee arthroplasty remains imperfect, enjoying a somewhat lesser degree of recognition and success than total hip arthroplasty. In the past few years, however, medical technology has made inroads in correcting the errors of the early pioneers in the field of total knee replacement. This technology is continuously developing.

The prosthesis

A prosthesis is the replacement of a missing, damaged or chronically painful part of the body by an artificial substitute. To be satisfactory, among other attributes, a prosthetic device should provide the client/patient with relief of pain. It should adequately correct any deformity present.

An ideal joint prosthesis will correct and provide stability as well as furnish the individual with at least 90° or more of flexion. The artificial joint should be expected to maintain itself in excellent working order for several years, and in the event of prosthetic failure, should provide for easy arthrodesis (surgical immobilization of the failed joint or joint fusion) and/or revision of the prosthesis.[1]

Patient selection

Who should have a new knee joint? Total knee arthroplasty should be considered a valid surgical procedure before arthrodesis if the person would have been a candidate for arthrodesis before the advent of total knee arthroplasty.[1]

This procedure is performed for patients with osteoarthritis, rheumatoid arthritis and traumatic arthritis where the degree of articular surface destruction and joint laxity precludes the use of a simpler operation, for example, a synovectomy (the excision of the synovial membrane).

Knee joint arthroplasty is done to decrease or relieve pain, to improve joint stability and to correct deformity present in the joint. The individual being considered for a new knee joint should probably be around 60 years of age or older. The reason for this is that the long term results are not yet fully known to surgeons, with the life of current prosthetic devices appearing to be around seven to ten years.

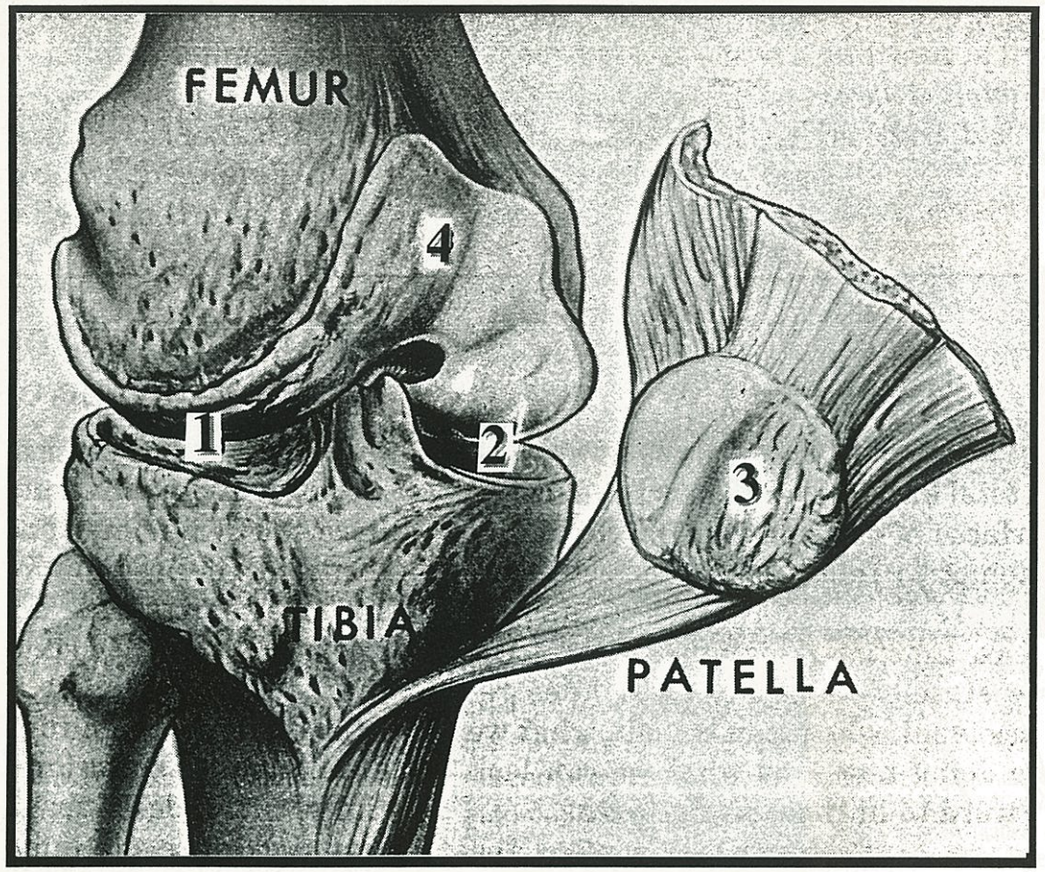
Thus, putting a prosthesis in someone 40 or 50 years old may severely limit future options if the implant fails or wears out when they are 60 years old.

Delayed and immediate complications associated with arthroplasty of the knee joint occur frequently enough for it to be considered as a last resort when all other alternatives, except arthrodesis, have been exhausted. For those individuals who have had a total knee arthroplasty, more than 50% have been satisfied with the outcome, and around 80 percent reported pain relief after surgery.

Three categories of prosthetics

Although many different models (of artificial knee joints) exist on the market today, prosthetic devices can be divided or classified into three basic categories based on degree of restraint:

1. Non-constrained
2. Partially constrained, and
3. Fully constrained[2]



Articulating surfaces of the knee

1. **Lateral femoral condyle & tibial plateau**
2. **Medial femoral condyle & tibial plateau**
3. **The articular surface of patella**
4. **Anterior surface of femur**

• The first category of prostheses are non-constrained, which amount primarily to resurfacing implants; that is, replacing one or both sides of the tibial plateau and offering very minimal restriction of movement.

• Partially constrained implants, the second category, restricts motion transversely, rotationally and in anterior/posterior directions. With partially constrained implants, only the articulating surfaces are replaced, with partial stability of the joint coming from the metal runners of the femoral component articulating with the grooved polyethylene tibial component. The patient must have stability of the medial collateral ligaments and posterior cruciate ligament if the partially constrained implant is used.

• Constrained implants by definition limit movement in all planes. Hinged type joints are used when there is marked instability and supporting ligaments are destroyed, or for revision when other attempts have failed. They are designed to give increased stability since the femoral component is fixed to the tibial component to form a hinge. Non-hinged joints are similar in principle to hip prostheses since a stainless steel femoral component articulates directly with a high density polyethylene tibial component. **(Illustration 1 - following page)**

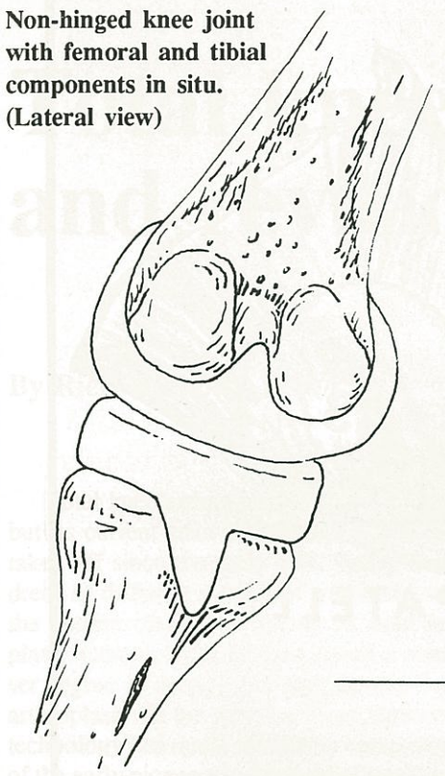
The procedure

Although each particular model of non-hinged and hinged joints will come supplied with its own particular surgical guide from the manufacturer, the procedure for the operating room technician follows a similar pattern for all.

Generally, a medial parapatellar incision is made and the patella is averted and deflected off to the side. **(Diagram above)**. Once the knee joint is exposed tissues are removed from the joint to expose the distal femur. With the knee flexed to at least 90°, an alignment guide is placed in a drill hole that has

Illustration 1.

Non-hinged knee joint with femoral and tibial components in situ. (Lateral view)



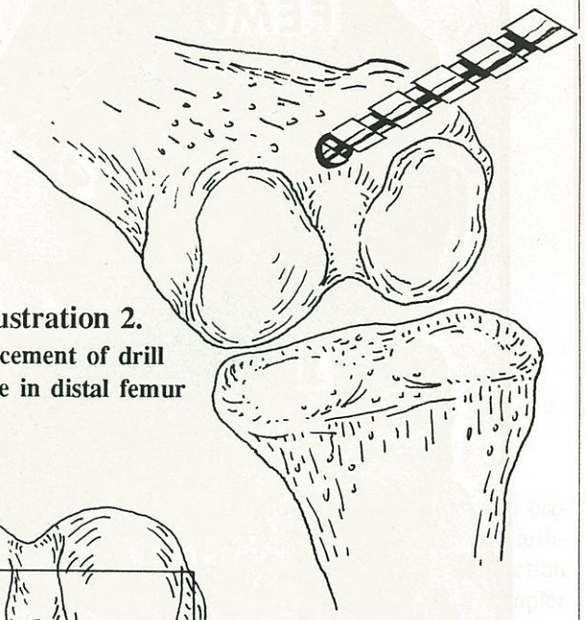


Illustration 2.
Placement of drill hole in distal femur

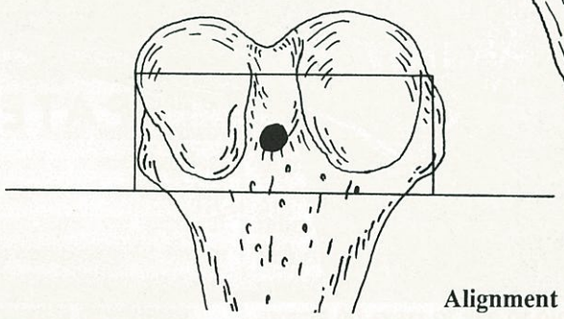


Illustration 3.
Alignment guide placement

been placed anterior to the intercondylar notch and parallel to the femoral shaft. **(Illustration 2)**

A femoral cutting guide is placed parallel to the posterior femoral condyles so that the surgeon can make correct cuts and ensure proper placement of components in subsequent steps. **(Illustration 3)**

Next, the anterior condyles are removed by using various attachments on the alignment guide. Following this, the distal femur is excised using the distal femoral cutting guide, and the lateral and medial condyles are resected.

The distal femoral surface should be checked to ensure that it is flat in order to ensure proper placement of instrumentation.

Following the femoral cuts the anterior/posterior measurements are done with the knee hyperflexed. With the measurements obtained, one can fix the femoral cuts if needed.

Next, the surgeon will progress to the tibial cuts, and after ensuring proper anatomical alignment with a tibial cutting guide, the proximal end of the tibia is resected.

Following completion of the tibia, the patella is prepared to receive its component by making sure the posterior aspect is flat. This is done by holding it firmly with the appropriate instrument and using a saw to shave it down to the level of quadriceps tendon insertion. This now completes the bone cuts necessary for the insertion of the prosthetic implants. **(Illustration 4)**

It is probably best to use a new saw blade for each case to ensure the best possible cuts. The operating room staff should note that although some 600 different saw models are available, each has the same equipment to do the basic bone cuts. These instruments may look different and be called different names, but they do the same basic things.

Alignment

Thus far, in this description of the surgical procedure for a total knee replacement, alignment is mentioned repeatedly. In order for the surgical team to achieve the goals of arthroplasty adequately, normal alignment must be reconstructed or preserved in order to maintain optimal alignment and ligamentous balance in the knee.[8,9]

As noted in **Illustration 5**, the normal stress bearing surfaces on the knee is 3° valgus (a term denoting position, meaning bent outward or twisted,

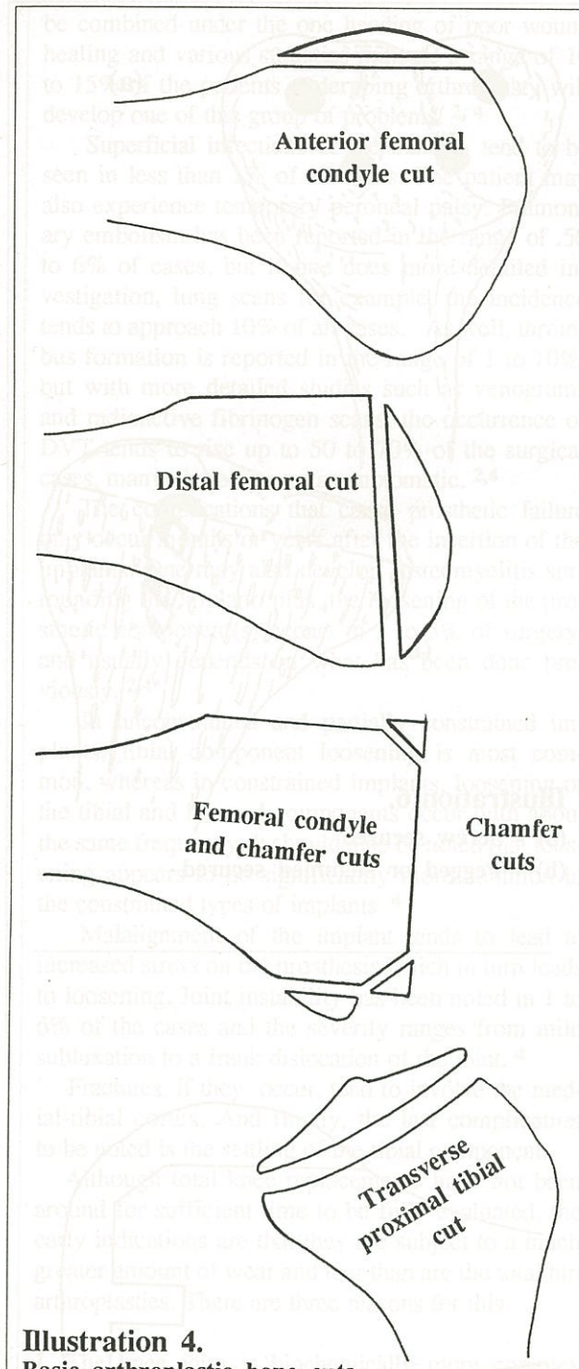


Illustration 4.
Basic arthroplastic bone cuts

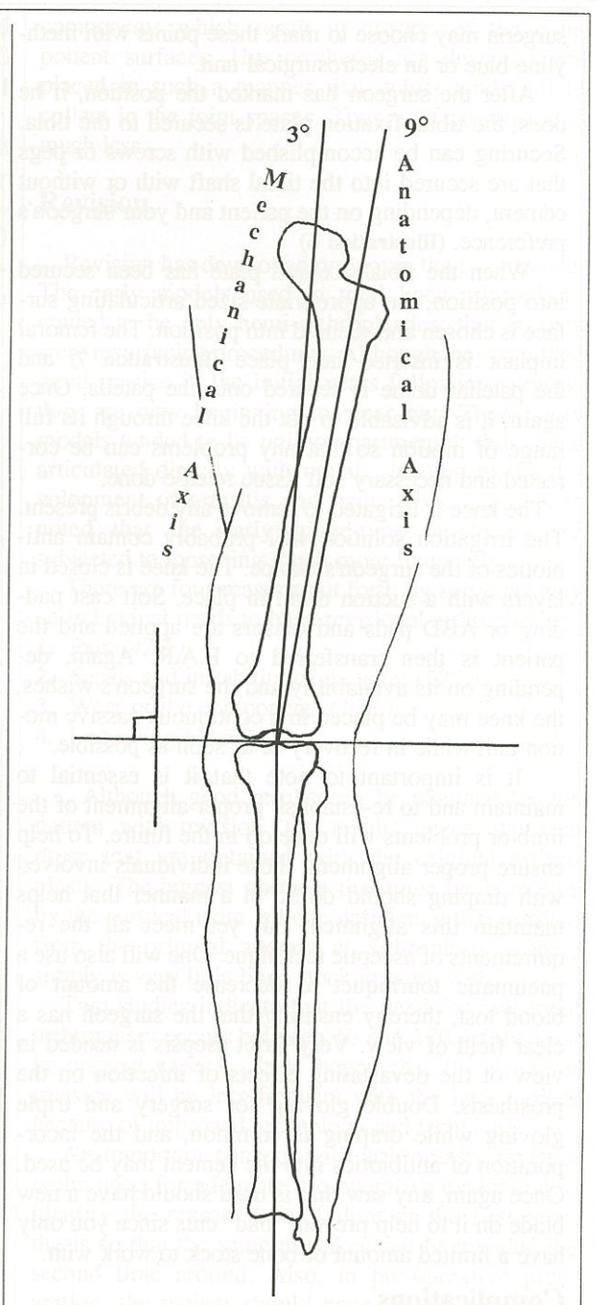


Illustration 5.
Maintaining proper alignment

and away from a identifiable midline or axis) with the anatomical axis of the femur approximately 9° valgus. The normal tibial surface is about 3° valgus. So, the implants must be inserted correctly to maintain this proper alignment to avoid problems in the future. The measurements allow the surgeon to cut the distal femur perpendicular to the mechanical axis and ensures a parallel cut in relation to the proximal tibial surface.

The operating room nurse can now prepare the tibial trial and femoral trial components that the surgeon will use. Once the surgeon has the tibial and femoral trial components properly situated, he/she should put the knee through its full range of movement and check the ligament stability. As the surgeon puts the joint through its range of motion, the tibial and femoral trial components will seat themselves into their ideal position; at this point the

surgeon may choose to mark these points with methyline blue or an electrosurgical unit.

After the surgeon has marked the position, if he does, the tibial fixation plate is secured to the tibia. Securing can be accomplished with screws or pegs that are secured into the tibial shaft with or without cement, depending on the patient and your surgeon's preference. **(Illustration 6)**

When the tibial fixation plate has been secured into position, the appropriate-sized articulating surface is chosen and secured into position. The femoral implant is inserted into place **(Illustration 7)** and the patellar dome is secured onto the patella. Once again, it is advisable to put the knee through its full range of motion so that any problems can be corrected and necessary soft tissue release done.

The knee is irrigated to remove any debris present. The irrigation solution will probably contain antibiotics of the surgeon's choice. The knee is closed in layers with a suction drain in place. Soft cast padding or ABD pads and tensors are applied and the patient is then transferred to P.A.R. Again, depending on its availability and the surgeon's wishes, the knee may be placed in a continuous passive motion unit while in recovery or as soon as possible.

It is important to note that it is essential to maintain and to re-establish proper alignment of the limb or problems will develop in the future. To help ensure proper alignment, those individuals involved with draping should do so in a manner that helps maintain this alignment but yet meet all the requirements of asceptic technique. One will also use a pneumatic tourniquet to decrease the amount of blood lost, thereby ensuring that the surgeon has a clear field of view. Very strict asepsis is needed in view of the devastating effects of infection on the prosthesis. Double gloving for surgery and triple gloving while draping is common, and the incorporation of antibiotics into the cement may be used. Once again, any saw that is used should have a new blade on it to help prevent "bad" cuts since you only have a limited amount of bone stock to work with.

Complications

As with any procedure, the total knee arthroplasty is not without its complications. Complications can be divided into two different categories, the first being early complications and the second, late complicatiosn or those that lead to failure of the prosthesis. General anaesthesia in and of itself has potential serious problems for the patient as well.

Early complications include haematoma formation, necrosis of the skin since the knee doesn't take kindly to multiple criss-cross incisions and sterile drainage. These three separate problems can

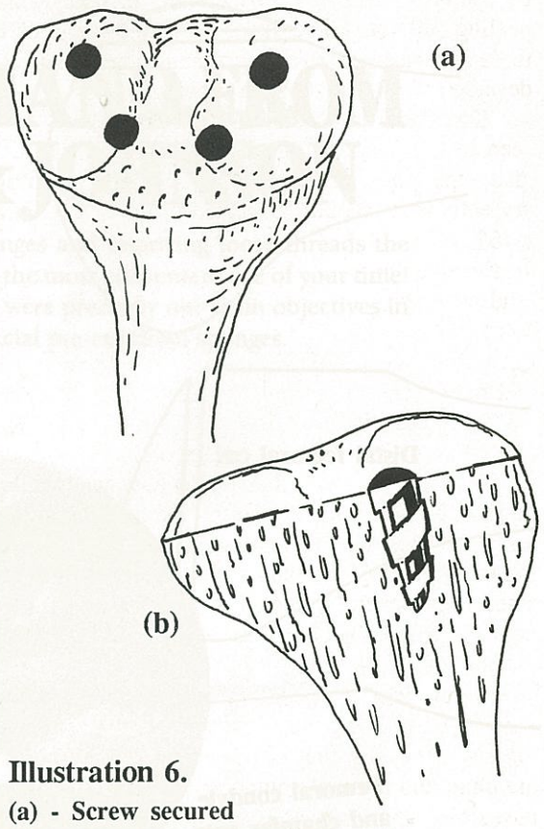


Illustration 6.
(a) - Screw secured
(b) - Pegged or stemmed secured

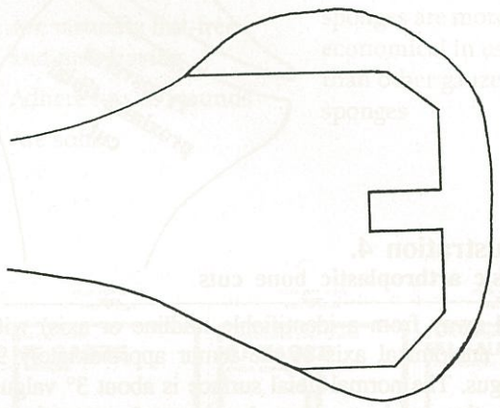


Illustration 7.
Femoral component attached

be combined under the one heading of poor wound healing and various statistics indicate a range of 10 to 15% of the patients undergoing arthroplasty will develop one of this group of problems. [2, 4]

Superficial infections of the incision tend to be seen in less than 1% of all cases. The patient may also experience temporary peroneal palsy. Pulmonary embolism has been reported in the range of .50 to 6% of cases, but if one does more detailed investigation, lung scans for example, the incidence tends to approach 10% of all cases. As well, thrombus formation is reported in the range of 1 to 10%, but with more detailed studies such as venograms and radioactive fibrinogen scans, the occurrence of DVT tends to rise up to 50 to 70% of the surgical cases, many obviously are asymptomatic. [2,4]

The complications that cause prosthetic failure may occur months or years after the insertion of the implants. One may also develop osteomyelitis surrounding the implant; plus, the loosening of the prosthetic component(s) occurs in 3 to 5% of surgery, and usually depends on what has been done previously. [2,4]

In unconstrained and partially constrained implants, tibial component loosening is most common, whereas in constrained implants, loosening of the tibial and femoral components occur with about the same frequency. It should also be noted that loosening appears to be significantly more common to the constrained types of implants. [4]

Malalignment of the implant tends to lead to increased stress on the prosthesis which in turn leads to loosening. Joint instability has been noted in 1 to 6% of the cases and the severity ranges from mild subluxation to a frank dislocation of the joint. [4]

Fractures, if they occur, tend to involve the medial-tibial cortex. And finally, the last complication to be noted is the settling of the tibial component.

Although total knee replacements have not been around for sufficient time to be fully evaluated, the early indications are that they are subject to a much greater amount of wear and tear than are the total hip arthroplasties. There are three reasons for this:

1. The knee joint is biochemically more complex than the hip joint. The ball and socket of the hip allow mainly rotational movement, while with the knee, one must contend with sliding, rotational and flexion/extension movements.

2. The knee joint is subjected to a wide variety of stress-producing forces.

3. The basic component design of knee prostheses causes debris to become entrapped in between the components which result in erosion of the component surfaces. Hip protheses are designed and placed in such a manner that debris tends not to collect in the joint spaces. Thus, surface erosion is much less.

Revision

Revision has developed only over the past decade. The early models used in total knee arthroplasty tended to be only hemi-arthroplasties; that is, they were resurfacing procedures. Although they provided good service in the initial years following surgery, they are now beginning to wear out. These early models tended to be uni-compartmental; thus, bone articulated directly with metal, leading to the development of arthritis and pain. Also, it has been noted that the early hinge-type prostheses are subjected to loosening much more frequently.

There are four reasons put forth by surgeons why an individual needs to have revisional arthroplasty:[6]

1. Pain *(42%)*
2. Sepsis and instability of the joint *(32%)*
3. Wear of the components *(16%)*
4. Loosening *(12.5%)*

Although good results can be obtained for the patient with revision, the results never approach those that are obtained with the original arthroplasty. The biggest obstacle that must be overcome by the surgical team is bone deficiency that resulted from the original attempt at arthroplasty - there simply is very little bone stock to work with.

Two studies indicate that the need for revisional arthroplasty occurs between 10 and 13% of the time in original cases.[5] It is hoped that the need for revision will be less frequent with the later models because of improved technology and technique.

An important concept with arthroplasty revision is the need for adequate pre-operative evaluation to identify the reason(s) for failure of the first prosthesis so that the same mistakes can be avoided the second time around. Also, in pre-operative preparation, the patient should have weight-bearing X-rays in order to evaluate the amount of bone likely to be left when failed components are removed.

Revision problems

The amount of bone stock left from the previous surgery may influence the surgeon's choice of prosthesis that will be used. The surgeon will also want to determine if sepsis is present prior to surgery by the use of physical findings, CBC, sed rate, gram stains and cultures of joint fluid. In revision, the team will encounter three problems:

1. bone loss
2. previous bone-cement interface with its resultant sclerosis, and
3. soft tissue scarring

Surgery begins with special attention given to the skin and soft tissues. The revision incisions will be made through the previous incisional scar. Special care is given to prevent patellar tendon avulsion (tearing away of the structure). The underlying muscles are divided to allow for good exposure of the field. The old implant is carefully removed so as to preserve as much bone as possible and to protect ligamentous structures.

Once the team has carefully removed the old implant, removal of any remaining cement and interposed fibrous membranes that have formed is done so that there will be no barriers to bone-cement interfacing when the new prosthesis is implanted. Inserting new cement under pressure while it is less viscous ensures better penetration into the cancellous bone present, thus, hopefully, resulting in a more secure interfacing. Once the surgeon has removed the old implant, he will have a better idea of the type of implant that will be used for the revision. Therefore, before surgery, operating room staff must ensure that a full range of implants are available. Generally, the least constrained device possible that adequately rectifies the problems will be used.[4] The goal is to ensure proper seating of the component on as large an area of bone that is possible. The use of thick stemmed tibial components help to compensate for this bone loss.

Proper closure of the revision is equally important. Bone grafting ligament release or advancement may be needed in order to regain balance of soft tissues and stability. Balancing of the quadriceps mechanism is important for proper patellar tracking, as is attachment of the vastus medialis. All this ensures or helps to ensure the stability of the joint similar to that found in a healthy knee. Postoperative care regime is similar to that followed for the initial arthroplasty.[7]

Conclusion

For the older or more sedentary patient, the goals of total knee arthroplasty include pain relief, improved stability of the joint and correction of deformity. Thus, improving the patient's independence and well-being appears to have the same success as that approaching or associated with hip arthroplasty.

For the younger, more active patients, the development of porous coated prostheses that promote biological fixation by boney growth similar to that of cementless hips, and the use of better equipment and techniques, holds great promise for the future. The use of these new types of prostheses in younger patients (under 60 years of age) appears to overcome the limited life expectancy of current models, thus giving a better quality of life to more people.[4] ■

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Autobiography

Rick Harburn, R.N.A., received his diploma from Assiniboine Community College in Brandon, Manitoba. He is a graduate of the Post Graduate Operating Room Technique Program at Hotel Dieu Hospital in Kingston, and is currently an operating room technician at the Ottawa General Hospital.

Newfoundland OR nurses announce dates for 10th Annual Conference

The Newfoundland and Labrador Operating Room Nurses Association (NLORNA) will be holding its 10th Annual Conference at the Glynmill Inn in Corner Brook, Newfoundland. Dates for the conference are June 1 to 3. For more information contact:

Angela Lemoine, R.N.
Chairperson - P.R. and Hospitality
P.O. Box 67 W.E.P.S.
Corner Brook, Nfld. A2H 3J0

First Provincial Conference

Operating Room Nurses Association of Ontario

The Constellation Hotel

Airport Road, Toronto, April 24 - 26, 1989

The First Provincial Conference of the Operating Room Nurses Association of Ontario will be held from Monday, April 24 to Wednesday, April 26 at the Constellation Hotel on Airport Road, Toronto.

It is expected that this will be one of the largest operating room nurses conferences in Canada to date. Over 70 companies have already committed to be exhibitors and delegate registration is expected to surpass the 600 mark.

Regional OR Associations

The Operating Room Nurses Association of Ontario (O.R.N.A.O.) was formally established in March, 1982. At that time, the eight existing regional operating room nurse interest groups in Ontario joined together to form one provincial group, the O.R.N.A.O. These eight interest groups are:

- Windsor and District Operating Room Nurses Association (W&DORNA)
- London and District Operating Room Nurses Association (L&DORNA)
- Operating Room Nurses Association of Hamilton and District (ORNAH&D)
- Operating Room Nurses Association of Greater Toronto (ORNGT)
- Northern Ontario Operating Room Interest Group (NOORIG)
- Operating Room Nurses Association of South Central Ontario (ORNASCO)
- Lakehead Operating Room Nurses Association (LORNA)
- Ottawa and Region Operating Room Nurses Association (ORORNA)

UNITING FOR THE FUTURE

Operating Room Nurses Association of Ontario

The executive of the Operating Room Nurses Association of Ontario is composed of:

- **President** - Carol Lenox
- **Past-president** - Carole Starr
- **President-elect** - Hilda Gatchell
- **Secretary** - Jane Cunningham
- **Treasurer** - Linda Babinski
- **Committee Co-ordinator** - Darlene Beaudet

The three representatives from the O.R.N.A.O sitting on the board of the Operating Room Nurses Association of Canada (ORNAC) are:

- Carol Lenox, ORNAC vice-president
- Carole Starr, ORNAC treasurer
- Hilda Gatchell, Board member

Regional to provincial

In past years, the Operating Room Nurses Association of Greater Toronto sponsored their Conference in the Toronto area. This event was perceived by many as a provincial undertaking - even though it was under the auspices of a regional group. It was strongly felt by the majority that there should be a conference that was truly representative of the province. Thus, plans were formulated to transfer the Greater Toronto Conference to provincial jurisdiction. Two years ago, in order to expedite the transition, a number of the organizers of the Greater Toronto Conference were recruited from regional associations. With this first Confernce in April under the direction of the provincial association, the transition has been completed.

The Conference Planning Committee is headed by Chairperson, Jane Cunningham, St. Joseph's Health Centre, Toronto; Publicity Convenor is Hilda Gatchell, Oshawa General Hospital; Exhibitors Committee, Donna Kaufmann, Women's College Hospital, Toronto; Program Committee, Sharon Ball, Mount Sinai Hospital, Toronto; Entertainment and Social Committee Convenor, Mary Barstow, Mississauga Hospital; Registration, Patty Fleming, Woodstock General Hospital.

Below is a photo of the members of the Provincial Conference Planning Committe, ORNAO. ■

ORNAO Conference Planning Committee

Back row (L-R): Vija Hay (Ottawa & Region), Helen Gibson (Hamilton & District), Marilyn Evans (Greater Toronto), Mary Dunkerly (Greater Toronto), Carolyn LaPorte (South Central Ontario), Susan Schulte (Greater Toronto), Hilda Gatchell (South Central Ontario), Carole Starr (South Central Ontario), Ulla Rollins (Greater Toronto). **Front row (L-R):** Mary Barstow (Greater Toronto), Marlene Muir (Greater Toronto), Jane Cunningham (Greater Toronto), Sharon Ball (Greater Toronto), Diana Jorgensen (Greater Toronto). **Missing:** Patty Fleming (London); Donna Kaufmann (Toronto).

ORNAO Conference Agenda

Sunday, April 23, 1989

1800 - 1930	Pre-registration
2000 - 2230	**Get-Together Cocktail Party**

Monday, April 24, 1989

0730 - 0815	Registration
0815 - 0900	**Opening Ceremonies**
0900 - 0945	**Keynote Speaker** - Dr. Don Sabo, D'Youville University, Buffalo, N.Y.
0945 - 1015	Coffee Break
1015 - 1115	**ORNAO General Meeting**
1115 - 1130	Opening of Exhibits
1130 - 1500	**Viewing of Exhibits/Lunch**
1500 - 1630	Lung transplantation - the Toronto experience - Dr. R.J. Ginsberg; Joan Bobb, R.N.; Sadie Miller, R.N.
1500 - 1630	**Workshops** - See Workshop Agenda
1900 - 2130	**Ethicon Night**

Tuesday, April 25, 1989

0730 - 0830	Registration
0830 - 1000	"Not by salary alone" - Today's challenge in the recruitment and retention of nursing staff," Nancy Myers, B.N., M.Ed.

0830 - 1000	"What's new in laser technology," (Dr. M. Goldberg; Dr. H. Stern; Dr. Paihramis; Sharon Ball, RN)
0830 - 1000	Workshops - See Workshop Agenda
1000 - 1030	Coffee
1030 - 1130	"Giving recognition for effective nursing care," Jane Finon, B.Sc.N.
1030 - 1130	"Current treatments for carcinoma of the rectum," Dr. A.P. Valiulis
1030 - 1130	**Workshops** - See Workshop Agenda
1130 - 1500	**Viewing of exhibits/Lunch**
1500 - 1630	"O.R. nursing and the law - friend or foe?" Chris Paliere, L.L.B.
1500 - 1630	"Multiple facial fractures," (Dr. J. Phillips)
1500 - 1630	**Workshops** - See Workshop Agenda
1830 - 1930	**Exhibitors' Reception**
2000 - 0100	"A Provincial Formal Affair" **(Dinner and Dance)**

Wednesday, April 26, 1989

0730 - 0830	Registration
0830 - 1000	"The Barrie disaster," Dr. T. Porter
0830 - 1000	"Stress and what the #*@&~@# can we do about it!" (Dr. Blank, Ph.D., Psychology)
0830 - 1000	**Workshops** - See Workshop Agenda
1000 - 1030	Coffee break
1030 - 1130	"The Cottrel-DuBosset technique for scoliosis," Stuart Legless, R.N.
1030 - 1130	"Malignant hyperthermia update," (Juliette Beaudet, R.N.)
1030 - 1130	**Workshops** - See Workshop Agenda
1130 - 1400	Viewing of exhibits and lunch
1400 - 1600	**Closing speaker** (Carol Bertucci-Luciani)
1600	Closing ceremonies

Workshop Agenda

1st Provincial Conference

Operating Room Nurses Association of Ontario

Monday, April 24, 1989

1500 - 1630

1. Arthroscopy - Zimmer
(Limited to 20 pre-registrants)

2. Rigid internal fixation of the cranio-maxillo-facial skeleton - Howmedica
(Limited to 20 pre-registrants)

Tuesday, April 25, 1989

0830 - 1000

1. Interpretation of basic arrythmias
Gail Summers, R.N., workshop speaker
(Limited to 10 pre-registrants)

2. Extracapsular cataract extraction and intraocular lens implant - Pharmacia - Dr. B. Sniderman
(Limited to 10 pre-registrants)

1030 - 1130

1. Recommended practices: electrosurgery
Valleylab (Limited to 20 pre-registrants)

2. Introduction to sinoscopy technique and instrumentation - Laborie - Dr. Michael Hawke
(20 pre-registrants)

1500 - 1630

1. Internal stapling techniques and staplers
Auto Suture
(Limited to 20 pre-registrants)

2. Care, handling and draping of microscopes
Zeiss Canada - Jane Davidson, R.N.
(Limited to 20 pre-registrants)

Wednesday, April 26, 1989

0830 - 1000

1. Hands-on hip screw workshop - Synthes
Janet Williams, R.N. (20 pre-registrants)

2. Extracapsular cataract extraction and intraocular lens implant - Dr. Sniderman (10 pre-registrants)

1030 - 1130

1. Techniques of skin closure
Davis and Geck - Dr. Neil Hutchinson
(Limitedf to 20 pre-registrants)

2. Invasive monitoring - John Traill, R.R.T.
(Limited to 20 pre-registrants)

- **Note: 1130 - 1500 daily, video workshops will be available**

For conference inquiries contact:
Hilda Gatchell,
Publicity Committee Co-ordinator
208 Oshawa Blvd. North,
Oshawa, Ontario L1G 5S9
(416) 434-6585 (Home)
(416) 576-8711 Ext. 3238

All nurse-delegates have important role to play when viewing exhibits

Nurse-delegates attending the ORNAO conference have an important role to play when they view the exhibits. If it is accepted that the quality of pari-operative patient care is affected by the products used in the O.R., then the degree with which operating room staff understand the products that are used also affects the quality of patient care.

Even if one is not involved in the purchasing of the products on display, it is important that all delegates use the viewing time to familiarize themselves with the operating room technology and instrumentation they will be using or maintainingr.

Delegates to the First Provincial Conference of the Operating Room Nurses Association of Ontario will be provided the opportunity to learn about the latest in surgical techniques, instrumentation and operating room equipment. In turn, this opportunity, if taken full advantage of, translates into better patient care.

The representatives of the various companies who will be exhibiting are eager to demonstrate their products. Even if you are not part of the purchasing decisions, company representatives want to talk with you. A product exhibition is as much a learning experience for the reps as it is for the nurse-delegates.

The companies that manufacture and supply the products to your hospital are eager to exchange information and ideas with the users. They are as concerned about the complaints you may have as they are with the accolades you want to pass on.

Feedback on the exhibit floor is essential. It is possible, for example, that a particular item or device will be seen that could improve the care that your facility provides. If such is the case, this is the time to pass on to the rep the name of the person at your hospital that should be contacted. Thus, you don't have to be directly involved in purchasing decisions to play a prominent role for your hospital's surgical department.

Over 80 exhibitors

Donna Kaufmann, co-ordinator of the exhibitors committee for the ORNAO Conference, expects more than 80 companies to exhibit at the three-day conference. As of March 1, over 100 exhibit booths have been allocated, with the few remaining spaces expected to go prior to the conference opening.
Exhibit hours are:

Monday & Tuesday, April 24/25 - 1130 - 1500
Wednesday, April 26 - 1130 -1400

First Biennial Conference

Operating Room Nurses Association of Ontario

Exhibitors as of March 1, 1989

- Abbott Laboratories
- AMD-Ritmed - Div. of Pharmascience Inc.
- Allergan Inc.
- American Sterilizer
- Angelica-Whitewear
- Aurora Biomedical Systems
- Auto Suture Canada
- Bard Canada
- Baxter Corporation
- Becton Dickinson Canada Inc.
- BEEJAY Medical Ltd.
- Canada Microsurgical
- Beltec
- Canadian Anaesthetic & Respiratory
- Canadian Hospital Specialties Ltd.
- Carl Zeiss Canada
- Carsen Medical & Scientific Co. Ltd.
- Cleanwear Products
- Deknatel
- DeRoyal Industries Inc.
- Codman
- Cook(Canda) Ltd.
- Davis & Geck Sutures
- Dittmar
- Dow Corning Canada
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- Epic
- Ethicon Ltd.
- Getinge Canada
- Graphic Controls Canada Ltd.
- Haessler Deway Health Care Products
- Hennco Medical
- Heco Medical
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- Huntington Labs
- Immuno Canada Ltd.
- Imperial Surgical Co.
- Incare Medical (Div. of Hollister)
- Ingram & Bell
- Instrumentarium
- International Surgical Products Inc.
- Intra-Optics Canada
- J. Stevens & Son Co.
- Johnson & Johnson
- Kendall Canada
- Lac-Mac Ltd.
- Mallimer Laboratories
- McDavis Sales & Service Ltd.
- MDT Canada Ltd.
- Medical Mart Supplies
- Medigas
- Medilogic Ltd.
- Meditron
- Medtronic of Canada
- Pharmacia Canada Inc.
- Pilling Canada
- Puritan-Bennett Canada
- R. Laborie Surgical
- Richards Medical Co.
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- Siemens Electric Ltd.
- Sigmacon Medical Devices (Canada) Ltd.
- Sims Canada Ltd.
- Smith & Nephew
- Storz Instrument Co. of Canada Inc.
- Stryker International
- Surgikos Canada Inc.
- Synthes (Canada) Ltd.
- Tecnol International
- Techlem Medical
- 3M Canada
- Trudell Medical
- Users Choice (Data Management Technology Inc.)
- Valleylab Canada
- Weck Div. of Squibb Canada Inc.
- Wild Leitz Canada Ltd.
- Xomed/Surgitek, Div. of Zimmer
- Zimmer Canada

Demystifying general anaesthesia

By Melissa N. Marshall, R.N., B.N.

- Are you an operating room nurse who must occasionally help in the recovery room during busy times or after hours?
- Do you care for patients on a busy surgical floor?
- Are you a staff nurse working in the post-anaesthetic care unit or recovery room?
- Do you float to every patient unit in your hospital and possibly find yourself alone in the recovery room at 3 a.m. with no resources and a patient emerging from anaesthesia?

Unravelling the mysteries

If you answered "yes" to any of the above questions, then you have probably been faced with the uncomfortable situation of looking after patients whose surgery you understand, but whose anaesthetic has you baffled!

In this submission, we'll attempt to unravel some of the mystery surrounding general anaesthesia and help you form a basis for your care of the post-anaesthetic patient.

General anaesthesia

Goodman and Gilman (1980) define general anaesthesia as a "reversible state of unconsciousness produced by drugs, with sufficient depression of reflexes to allow a surgical procedure to be performed."

These drugs or anaesthetic agents work by interrupting the normal process whereby brain cells obtain their energy from oxygen or glucose for the generation of nerve impulses. If you've ever wondered why the patients seem to go to sleep so quickly and can awaken from an apparent deep sleep equally as rapidly, consider the brain for a moment:

1. The brain receives a very high proportion of the cardiac output because of its high metabolic demand.

2. Most general anaesthetic agents have a great affinity for lipids or fats; and the brain contains a very large amount of these substances.

3. The nerve cells responsible for the conscious state in the reticular activating system (the alerting system of the brain) are the smallest and most sensitive in the body and are the first to be affected by anaesthetics.

One can see that the brain will be exquisitely sensitive to these anaesthetic agents - with every patient reacting to them uniquely. The definition provided above of a general anaesthetic implies that there is more to a general anaesthetic than merely being put to sleep. If we examine the objectives of a general anaesthetic, it will be seen that the underlying principles of any general anaesthetic are similar...it is simply the agents and the technique being used by each practitioner which may vary.

Objectives of a general anaesthetic

An anaesthetic must meet a number of objectives so that the patient experiences a comfortable surgical experience, and the surgeon is able to perform the surgery. These objectives include the following:

1. Analgesia

The patient must be kept pain-free both during and following the surgical procedure. Remember that someone can be asleep, but still be in pain. Unconsciousness is not necessarily a measurement of analgesia. Agents used most commonly to achieve analgesia include our old friends Meperidine (demerol) and Morphine Sulphate, and the newer narcotics fentanyl, Alfentanil and Sufentanil. The choice of narcotic agent used depends upon many factors such as drug availability, cost, the anaesthetist's preference, type of surgery, length of surgery, the patient's condition, and the patient's history of narcotic use (i.e., allergies, etc.).

2. Unconsciousness

It is hoped that the patient will remain asleep and hopefully unaware of his or her environment during the surgical procedure. The drugs which provide the analgesia required, will not necessarily provide unconsciousness. You'll likely see two distinct groups of anaesthetic agents used here:

- those which will put the patient to sleep quickly (induction agents such as Pentothal), and
- those which will keep the patient asleep (maintenance agents such as halothane, isoflurane, nitrous oxide and narcotics) for the remainder of the surgery.

3. Muscle relaxation

From the surgeon's perspective, muscle relaxation is perhaps the most critical objective. Surgical access to the site is facilitated by the use of drugs which cause profound skeletal muscle relaxation. This permits less anaesthetic to be used, thereby causing less systematic cardiovascular compromise. This technique facilitates the patient's recovery, and may actually cause less post-op pain as a result of less surgical manipulation against tight muscles.

4. Control of autonomic reflexes

It is this factor (control of the autonomic reflex) which has led to the increasing sophistication of anaesthesia in recent times. In the early days of general anaesthesia, mortality rates were high, due in part to the reflex side effects caused by the agents being used. For example, most of the inhalational anaesthetic agents have a depressant effect on the cardiovascular system, related to their effect on various components of the autonomic nervous system. When it was recognized that this was occurring, other agents were brought into clinical practice to combat these side effects. The result has been the development of a more controlled peri-operative environment with fewer potentially lethal side effects.

The components of a general anaesthesia

If you've ever taken the time to glance at your patients' anaesthetic records, you may have concluded that it was a muddled potpourri of drugs and treatments that appeared to make little sense. There is, however, a pattern to all general anaesthetics and despite apparent differences, they are basically very similar. They must all meet the objectives we outlined earlier and they must do so in an orderly, sequential fashion. The pattern to be followed is:

1. ***Premedication***
2. ***Induction***
3. ***Maintenance***
   - unconsciousness
   - analgesia
   - muscle relaxation
4. ***Reversal***

I. Premedication

Most readers will be aware that this component of the general anaesthetic has changed dramatically over the past few years. What was once a standard narcotic and antisialogue (an agent that lessens or prevents the flow of saliva) combination has become a choice of numerous drug combinations or, indeed, nothing at all. The goals of the pre-medication are to obtain the effects of:

a) allaying anxiety
b) analgesia
c) amnesia
d) reducing nausea and vomiting
e) increasing gastric pH
f) reducing oral and mucosal secretions

Medications such as benzodiazepines H1, and H2 antagonists, droperidol, the opiates, the barbiturates and the anti-cholinergic preparations may be used together or in combination to achieve these effects.

For your own interest, try conducting a little survey within your hospital, and note the different types of pre-medications being used. It might be interesting to then compare the post-operative courses of the patient, based on the pre-medication given.

II. Induction of anaesthesia

The process of induction involves putting the patient to sleep and ensuring maintenance of a patient airway and ventilation while doing so.

The agents used most commonly to achieve this rapid unconsciousness are short acting barbiturates such as sodium pentothal (Thiopentone) or sodium brietal (methohexital sodium). Injected intravenously, the drug will circulate very quickly to the brain, where the reticular activitating system will respond to it, and sleep will ensue within 3 to 5 seconds. Many patients will experience a characteristic 'garlic' taste because it reaches the taste buds before the medulla. The barbiturates may also be given rectally, a route commonly preferred for children in whom an IV is difficult to establish.

The duration of the barbiturate will vary according to its uptake from body cells and re-release to the brain. Because of its affinity for fat cells, one can see that the barbiturates could cause prolonged recovery in the morbidly obese patient population.

In patients presenting with any form of cardiovascular compromise such as shock, tamponade, heart failure or trauma, the intravenous barbiturates with their cardiovascular depressant effect, would be a poor choice of induction agent. In these instances, Ketamine may be used as an alternative. It has a slight cardiovascular stimulating effect which may be beneficial for these individuals.

You may frequently see the anaesthetist administer a dose of non-depolarizing muscle relaxant such as pancuronium bromide (Pavulon), or vecuronium bromide (Norcuron), prior to the barbiturate. This is done to facilitate the process of intubation, and prevent the muscle spasm caused by the depolarizing muscle relaxant, succinylcholine (Anectine). The succinylcholine is a very short-acting neuro-muscular blocker which causes profound muscular relaxation, particularly of the jaw musculature and laryngeal muscles. This allows the anaesthetist to open the jaw, insert a laryngoscope and pass an endotracheal tube down through the vocal cords. Airway maintenance is thus established and ventilation maintained either by manual ventilation with the ambu-bag or with the mechanical ventilator.

III. Maintenance of anaesthesia

Maintenance agents include a combination of any of the following:

a) intravenous barbiturates
b) intravenous tranquilizers - such as droperidol
c) intravenous analgesics - usually opioids

(Cont'd on page 22)

Indications for a general anaesthetic

What factors determine an anaesthetist's decision to choose a general over a regional anaesthetic? Many of us remember some of the myths that used to circulate: "old people have spinals because they can't tolerate general anaesthesia," or, "someone with lung disease couldn't possibly have a general anaesthetic because of innate respiratory compromise."
These and many other such myths have been quashed with the advent of the newer, more sophisticated techniques of general anaesthesia. Today, the decision regarding anaesthesia is based on more specific, discrete and individualized data. Factors to consider include:

Age
The age of the patient is less of a factor than it used to be in terms of the elderly. The older patient with severe hemodynamic compromise may do better with a light general anaesthetic than with the massive hemodynamic insult caused by the sympathetic blockade of a spinal anaesthetic. Children will not usually tolerate regional anaesthesia well. A light general anaesthetic is most often administered for pediatric cases.

Patient preference
The preference of the patient should be a factor in the decision-making

Type of surgery
The proposed surgery may dictate the type of anaesthesia to be administered. Procedures requiring deep muscular relaxation such as abdominal surgery, will be better performed under general anaesthesia. Conversely, many surgeries such as cataract extractions and diagnostic arthroscopies may be readily performed with regional techniques.

Length of surgery
Length of surgery is an important factor. Regional blocks have a limited effectiveness such that longer procedures may require general anaesthesia.

History of toxicity
A prior toxic reaction to a local anaesthetic drug will necessitate an alternate choice for any given patient.

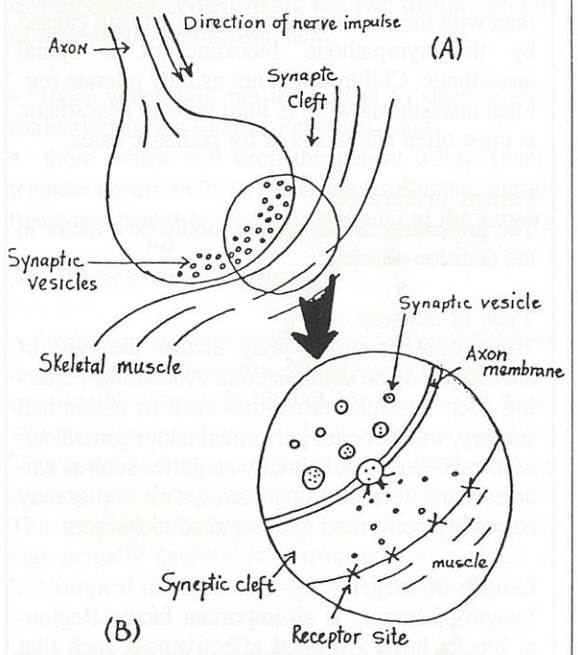
Preferences
The skill or preference of the anaesthetist may also influence anaesthetic choice. ■

d) muscle relaxants - the non-depolarizing neuro-muscular blockers
e) gaseous agents - such as nitrous oxide
f) inhalational agents, i.e., halothane, isoflurane

We mentioned the use of barbiturates, tranquilizers and analgesics earlier. Let's look specifically at the agents used to maintain muscular relaxation and unconsciousness.

Muscle relaxants

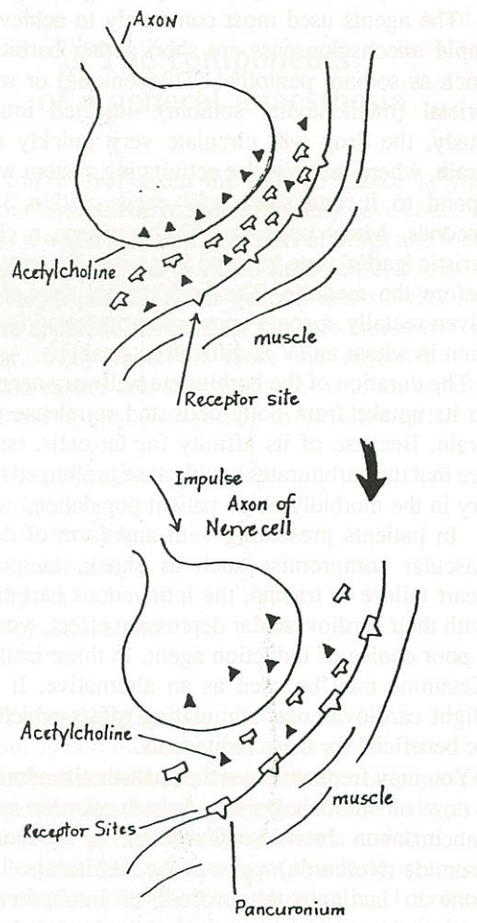
The agents most frequently used to achieve the deep skeletal muscular relaxation necessary for the surgeon to obtain surgical access are the non-depolarizing muscle relaxants (sometimes called "competitive blockers"). They work by "competing" with the normal neurotransmitter, acetylcholine, for access to the receptor sites on the muscle membrane. In order to understand how this works, let's take a look at the normal neuro-muscular junction.



The neuro-muscular junction

(A) The nerve impulse reaches the synaptic knob at the end of the axon, where the nerve meets muscle.
(B) The neurotransmitter substance crosses the cleft to depolarize the muscle cell on the other side. The crosses represent receptor sites on the muscle. Once depolarized, the muscle will contract.

So, how does the pancuronium or vecuronium work on this process? Let's look at another diagram of how the blocking agent molecules can "compete" for space on the receptor site.



Legend: ▲ = Acetylcholine/ ▽ = Pancuronium

There are 10 molecules of pancuronium in the top diagram and only 5 of acetylcholine. So, pancuronium wins the competition and slides into the receptor sites causing a competitive blockade with resultant paralysis.
In the lower diagram, the pancuronium has blocked the receptor sites, causing paralysis, and the acetylcholine is left waiting in the cleft unable to get into the sites and trigger a contraction.

The various types of non-depolarizing muscular relaxants vary in their potency and length of neuromuscular blockage they provide. Although pancuronium bromide has been a sort of gold standard for many years, we are seeing increasing use of the more intermediate duration agents such as vecuronium and atracurium.

As the nurse looking after a patient post-operatively, you should be aware of what type, what

dose and the last administration of muscle relaxant your patient received. You can see that these drugs may have prolonged effect in the post-op phase, particularly with respect to the patient's ability to maintain an airway and breathe adequately.

We must also maintain unconsciousness for the duration of the surgery. This is usually done with a combination of inhaled gases (usually N_20 and oxygen), and/or one of the inhalational agents such as halothane, isoflurane, enflurane, etc. These are administered to the patient via the endotracheal tube or mask, from the cylinders on the anaesthetic machine. The narcotics will also be used for routine patient maintenance.

Nitrous oxide

The only true gaseous agents used today are nitrous oxide and oxygen. N_2O is considered the least toxic of all agents and one of the most frequently administered. A relatively weak anaesthetic, its many advantages include:

1. rapid induction and emergence
2. intense analgesic properties
3. antiemetic capabilities
4. relative lack of toxicity or effect on cardiovascular system

Because it is a relatively weak anaesthetic, nitrous oxide is often given in tandem with one or more of the other agents.

It is important to recognize that N_2O must always be given together with oxygen. The oxygen molecule in N_2O is not available for use by the body, so the patient would become asphyxiated if not given adequate supplemental oxygen. Recovery from nitrous oxide simply involves washaing it out of the lungs by delivering increased concentrations of O_2 and less N_2O.

Inhalational agents

Although we tend to think of these agents as gases because they are delivered to the patient through the endotracheal tube, these drugs are actually highly volatile liquids at room temperature. When added to the vaporizers which you often see attached to the anaesthetic machine, they vaporize and join the stream of gases (e.g. N_2O and O_2) being delivered to the patient via the airway. The depth of anaesthesia may be varied according to the delivered percentage of these agents.

Agents included in this category are halothane, enflurane, methoxyflurane, and isoflurane. You may see one or two of these used routinely in your institution. Each agent differs slightly in its effects and side effects, but generally you will note that they all act as potent cardiovascular depressants. This has relevance when it comes to caring for a patient post-operatively who may still be suffering from the residual effects of anaesthetic

Intravenous agents

Often because of this cardiovascular compromise, or in an effort to prevent it, the anaesthetist may choose not to administer the inhalational agents. Instead, maintenance may be achieved by the use of nitrous oxide and oxygen and high doses of narcotic, such as fentanyl. Although used primarily as an analgesic agent, the narcotics may achieve the objectives of a general anaesthetic when given in large enough doses. This technique, referred to as "balance anaesthesia." is used frequently for patients undergoing open heart surgery. Often their left ventricular function is so poor that the side effects of the agents such as isoflurane and halothane could be devastating. The narcotics will achieve the desired effect with less CVS depression, and, as a bonus, may provide some degree of post-op pain relief.

You should be aware, however, that there are also disadvantages to every technique. With the narcotics there have been increased reports of intra-operative awareness, inadequate depth of anaesthesia and a diminished respiratory drive and cough reflex post-operatively. Knowing that your patient received primarily narcotics as anaesthetic agents will help you determine your plan for care for him/her post-operatively. What would you suspect could be a major post-operative problem for these patients?

IV. Reversal

The patient has been pre-medicated, induced, and maintained throughout the surgical procedure. Surgery is almost complete and it's time to think about waking this person up. How do we do that?

Reversal of anaesthesia is the final, and perhaps most crucial, step of the process. Timing is critical and post-operative recovery will depend greatly on the skill of the anaesthetist.

The process involves discontinuance of the maintenance agents such as the neuro-muscular blockers, inhalation agents, and narcotics, approximately 30-60 minutes before the anticipated end of surgery.

If the patient received a non-depolarizing muscle relaxant, the anaesthetist may reverse this drug with a preparation that promotes build-up of the neuro-

transmiter in conjunction with atropine or glycopyrolate. Neostigmine alone will cause a severe drop in heart rate, which the atropine will combat. Together these drugs will reverse the effect of the neuromuscular blocker and allow the patient to move (and breathe!) spontaneously.

Gradually the concentrations of nitrous oxide are lowered while the delivered oxygen is increased. The patient normally shows signs of regaining consciousness and reflexes before being transferred from the O.R. to the post-anaesthetic recovery room. Sophisticated monitoring techniques and the practice of maintaining anaesthesia at the lowest possible level, have now made post-operative emergence predictable and safe for the patient.

Can you see now that despite the apparent differences in a patient's general anaesthetic records, there are also many similarities? Each anaesthetic must achieve similar objectives of:

1. Analgesia
2. Unconsciousness
3. Muscle relaxation
4. Control of autonomic reflexes

You may find it helpful to recall these objectives the next time you see a general anaesthetic which really puzzles you. Ask yourself what objective each of these drugs is attempting to achieve and you may be surprised how easy it is to determine the answer.

Your post-operative care patients receiving general anaesthesia may depend on an understanding of all these agents and their effects and side effects. It is, therefore, worth your while to "demystify general anaesthesia." ■

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About the author

Melissa N. Marshall, R.N., B.N., is currently a critical care nursing consultant at Burnaby Hospital, Burnaby, B.C. One of her special interests is the promotion of recovery room nursing specialty. Several years ago, she designed a two-day Recovery Room Nursing Workshop which she continues to present. This article originated from a session presented at a recent conference in Halifax, Nova Scotia.

Tests show that the AIDS virus is capable of being transmitted as a mist during certain surgical operations

Research at Stanford University in California suggests that the AIDS virus can be transmitted through the air during operations, and that operating room personnel may need improved surgical masks to protect themselves.

According to a Canadian Press report, Dr. Greg Johnson, an orthopaedic surgeon at Stanford University, said that the experiments that were carried out show that surgical procedures that produce a lot of flying blood "should be considered somewhat suspect and that precautions should be considered." He said that recent experiments at Stanford University showed that the virus was able to travel 50 centimetres and infect human cells.

Also interviewed in the CP report was Dr. Lorraine Day, chief of orthopaedic surgrey at the San Francisco General Hospital. Explaining that she must often use power tools when performing surgery, Dr. Day said that "sometimes there is blood all over the floor. Sometimes blood is on the walls. I frequently have blood on my legs up to my knees."

In the Stanford University experiment, researchers dipped the power tools into AIDS-infected blood and turned them on near a dish of live human cells.

The surgical tools produced a fine mist, and later tests showed that the cells contracted the virus. Dr. Johnson said further tests are needed to determine whether a person who breathes in the mist is at risk.

First Biennial Conference
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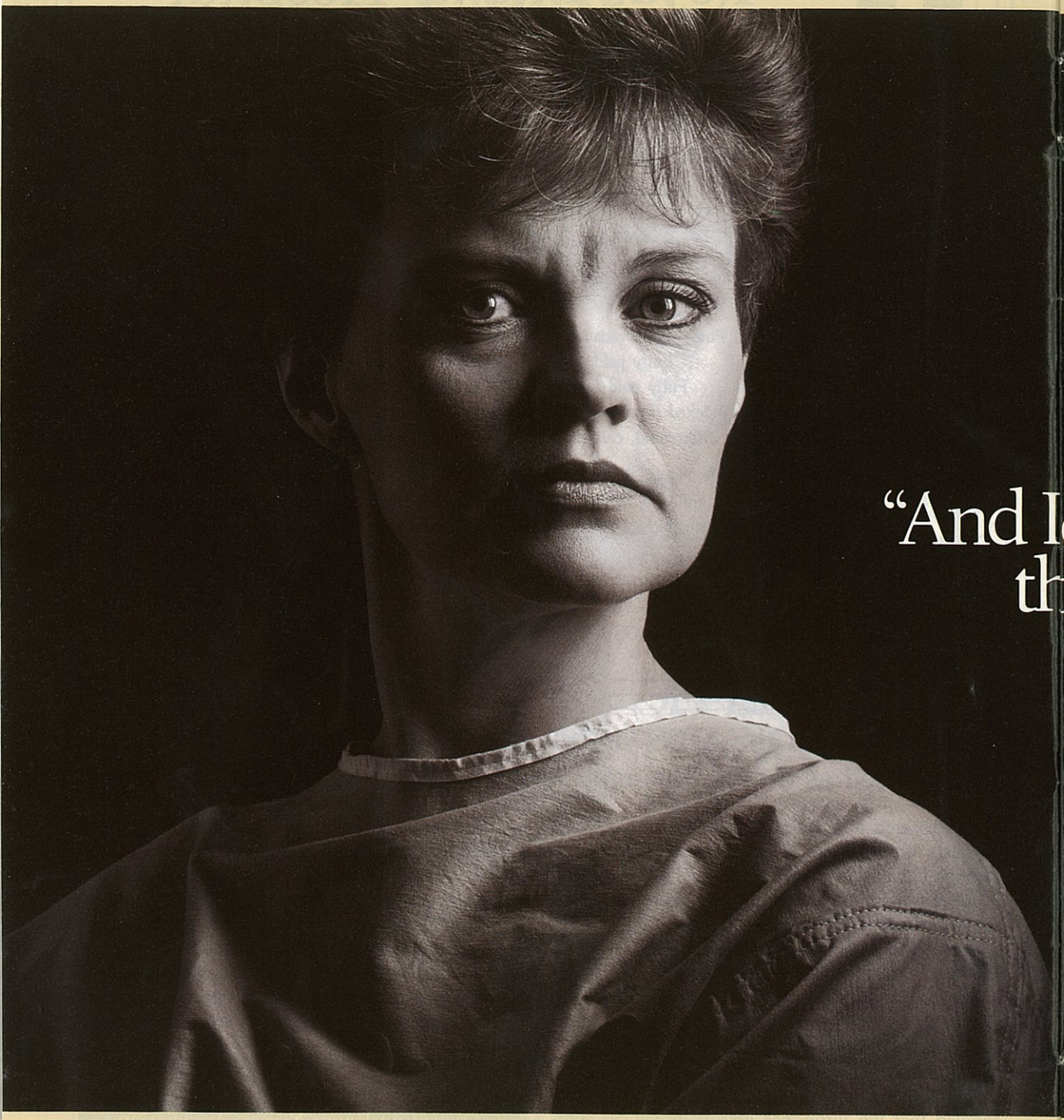
Constellation Hotel
Airport Road, Toronto
April 23 - 26, 1989



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"And I can't stop it because things don't work."

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Sedentary lifestyle and smoking main reasons for hip fractures in women

In the past 30 years, the number of hip fractures has doubled in developed countries, ie., United States, Canada, the U.K. and Europe, etc. The incidence of these fractures is about twice as high in women as in men, and since there are more elderly women in the population over age 65, 80% of those that suffer hip fractures are female.

What are the reasons for this "epidemic?" In a news article in *The Lancet* (January 7, 1989), a working party from the Royal College of Physicians (Great Britain) looked into the causes that would account for the significant increase in hip fractures.

Bone strength assessed in relation to bone density, the risk of falling and the effectiveness of protective neuromuscular responsiveness was considered to be deceptively simple in accounting for the increase in fractures.

This working party believes that only two aetiological (origin of cause) factors are worth considering, namely the increased prevalence of smoking among women during the first half of this century, and the more recent decrease in mobility as a result of a more sedentary lifestyle.

It was mentioned in the report that the lack of estrogen is undoubtedly important, as is an inadequate calcium intake, alcohol consumption and osteomalacia. But these factors, the researchers say, are of minor importance. The sedentary lifestyle and the increased incidence of smoking, according to the studies undertaken by the working party, are the main factors accounting for the aetiology of hip fractures among women in the past 30 years.

Vienna, Austria to be site of VI World O.R. Nurses Conference

The VI World O.R. Nurses Conference is scheduled for the Austria Centre in Vienna from August 28 to September 1, 1989. Sponsored by the Association of Operating Room Nurses (U.S.), registration details can be obtained by writing AORN Meeting Services Department, 10170 East Mississippi Avenue, Denver, Colorado 80231, U.S.A.

Canada has been well represented at past World Conferences, not only in registrations, but in speakers provided for the education sessions. In 1987 six Canadian nurses spoke at the education sessions in Singapore.

Writing the date correctly can prevent misinterpretation

Your bank statement, among other documents that require a specific date, reads 5/4/89. You probably have to stop and figure out if it's supposed to read May 4th, 1989 or the 5th of April, 1989.

When a date is expressed in numbers, sometimes the day is put first, and sometimes it's the month that is intended. In any case, the variations that can occur can be misleading, annoying and possibly dangerous.

Such confusion, however, is not necessary. There is a "right," internationally understood sequence that everyone should follow, particularly health care providers.

Based on international guidelines there are several general principles to follow when using all-numeric dates:

- The correct order is from the highest unit to the lowest, ie., year, month, day - (89/04/11), or, April 22, 1989. However, the month spelled out in words is also correct since the meaning is clear.

- Arabic numerals should be used, with four digits for the year, two digits for the month and two digits for the day. Under this system, April 22, 1989 becomes 1989-04-22. A two digit year is also acceptable - 89-04-22. However, starting with the year 2000, there will definitely be a risk of confusion: 2002-01-03 for January 3, 2002 will be easier to read than 02-01-03.

Do for nursing what Jean Nidetch did for weight control.

Homemaker Jean Nidetch turned common sense ideas and a motivational spirit into an international company, Weight Watchers, Inc., which has helped thousands of people live healthy, active lives. She and her dedicated colleagues counsel, educate and inspire others in their pursuit of healthy nutritional habits.

Susan Dietl, RN, CETN, and her colleagues at Kaiser Permanente in Southern California, are also dedicated educators, counselors and advocates of important ways people can take control of their individual health care needs. Working collaboratively, they developed an Ostomy Training Manual to fulfill the C.O.R.E. requirements for patient ostomy education. Unique in its design as a working tool for all nurses, the manual is impressive as a resource for nursing personnel and as an aid in patient education. Since its publication, it has improved ostomy care procedures and has promoted standardization of patient teaching regionwide.

We're proud of Susan and her colleagues. Their work has made a difference to the quality of care and training provided to those who undergo treatment throughout our Region.

We're looking for RNs who share Jean and Susan's dedication to improving the lives of others through education and shared inspiration.

Call our toll-free Career Opportunity Hotline at 1-800-553-1060, 24-hours a day, 7 days a week, for detailed information on our benefits which include 100% health care coverage for you and your family — and current RN openings. Or, submit your resume in confidence to: Kaiser Permanente, Regional RN Recruitment/Retention, Dept. JOU 51, 393 E. Walnut St., 7th Floor, Pasadena, CA 91188-8701. Equal Opportunity Employer.

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Hard Coat Anodizing Makes The Aluminum Surface Harder Than Stainless Steel. The electrochemical anodizing process reacts to aluminum at a molecular level, thereby allowing the hard coat to become an integral part of the metal. The result? The surface of bottoms and tops of our C.A.S.E. containers is harder than stainless steel.

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Hard Coat Anodizing Is The Number One Reason Our Customers Choose Genesis C.A.S.E. Over the Competition. They know that the process, the same one used to coat brakes on DC9's, delivers powerful extended wear protection.

REMEMBER: OUR HARD COAT ANODIZING PROCESS IS EXCLUSIVE TO GENESIS C.A.S.E. CONTAINERS.
For more information on these and other benefits of C.A.S.E. containers, contact us at the address listed below.

*Test results were established by Government approved laboratory tests.

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GENERAL DUTY NURSE

INUVIK REGIONAL HEALTH BOARD
INUVIK, N.W.T.

A challenging career opportunity is available to those with a background knowledge of operating room techniques. The O.R. oversees the recovery room and the central supply room.

Applicants must have a minimum of one year recent related experience and be eligible for registration in the Northwest Territories. Starting salary will range from $35,631.00 to $38,088.00 depending on experience, plus a yearly Settlement Allowance and Housing Allowance are available.

Individuals requiring further information can contact the Health Recruitment Officer at (403) 979-7203.

This competition will be used to establish an eligibility list for nursing vacancies in the Inuvik Regional Hospital.

REFERENCE NO.: EV-194-88-95-5693
CLOSING DATE: April 14, 1989

Submit applications including telephone numbers to:

Regional Superintendent,
Department of Personnel,
Government of Northwest Territories,
Inuvik, N.W.T. X0E 0T0

Northwest Territories

REGINA GENERAL HOSPITAL

Requires
Assistant Director, Operating Room

The Regina General Hospital is a 500-bed referral centre for southern Saskatchewan.

The Operating Suite has 11 theatres and is situated in a new facility which has state-of-the-art equipment. The department is staffed with 48 employees and has an operating budget of 3.3 million dollars.

The Assistant Director reports to the Director of Nursing and is responsible for short and long range planning and evaluating the day-to-day operation of the Operating Room activities.

Requirements:

The successful candidate must be registered with the Saskatchewan Registered Nurses Association with preference being given to applicants with a Bachelor of Nursing Degree as well as O.R. and management experience.

Please reply in confidence to:
Personnel Services,
Regina General Hospital
1440 - 14th Avenue,
REGINA, SASKATCHEWAN S4P 0W5

The Regina General Hospital is a "Smoke Free Environment"

HEAD NURSE

INUVIK REGIONAL HEALTH BOARD
Inuvik, N.W.T.

The Inuvik Regional Hospital has a vacancy for Head Nurse in the Operating Room. The O.R. oversees the recovery room and the central supply room.

Applicants must have a Bachelor of Nursing or a Nursing Diploma and eligibility for registration in the Northwest Territories; plus two years related experience. Starting salary will range between $39,092.00 and $41,912.00 per annum depending on experience, plus a yearly Settlement Allowance of $2,553.00. Benefits such as Vacation Travel Allowance and Housing Allowance are available.

Individuals requiring more information can contact the Health Recruitment Officer at (403) 979-7203.

REFERENCE NO. EV-193-88-95-5668
CLOSING DATE: April 14, 1989

Submit applications including telephone numbers to:

Regional Superintendent,
Department of Personnel,
Government of Northwest Territories,
Inuvik, N.W.T. X0E 0T0

Northwest Territories

- - TAKE A LOOK - -

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- A Friendly Atmosphere

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Please apply to: **Director of Personnel**
Dawson Creek & District Hospital
11100 - 13 Street
Dawson Creek, B.C. V1G 3W8
Telephone: (604) 782-8501

National Conference scheduled in 1990

The 11th National Operating Room Nurses Conference is scheduled April 2 to 6, 1990 at the Harbour Castle Hotel in downtown Toronto. Delegates wishing to pre-register contact:

Audrey MacDonald, OR,
Mount Sinai Hospital,
600 University Ave.,
Toronto, Ont. M5G 1X5.

Exhibitors contact:

Valerie Shirreff, OR,
Mississauga Hospital,
100 Queensway West,
Mississauga, Ontario
L5B 1B8 (416) 848-7628

Two OR bursaries to be awarded by Ethicon Ltd.

Two bursary funds have been established by Ethicon Ltd. to promote educational growth for operating room nurses in the provinces of Ontario and Quebec. The burseries, to be separately administered by the provincial operating room nurses associations of Ontario and Quebec, are each valued at $4000.00.

The Ethicon Bursary for Ontario will be presented Monday, April 24 during the Ethicon Night festivities which take place during the Ontario O.R. Conference, April 23 to 26 at the Constellation Hotel in Toronto.

The Ethicon Bursary for Quebec will be presented October 4 during "Ethicon Night" festivities at the Quebec Provincial O.R. Nurses Conference scheduled for the Sheraton-Lavel Hotel Oct. 4 to 6.

For over 20 years now, Ethicon has been sponsoring "Ethicon Nights" at provincial and national O.R. gatherings across the country. All O.R. nurse delegates attending these conferences are automatically invited to attend and participate in the festivities.

Manitoba OR nurses announce featured speakers and theme for association's biennial conference

The Manitoba Operating Room Nurses' Association (M.O.R.N.A.) will be holding its 3rd Biennial Conference in Winnipeg from June 11 to 13 at the Delta Hotel. Keynote speaker will be Linda K. Groah, R.N., B.S.N. Ms. Groah was the recipient of the 1988 Award of Excellence in Perioperative Nursing presented by the American Association of Operating Room Nurses. Her topic, also the Conference Theme, will be "Perioperative Nursing: From Novice to Expert."

Also on the agenda will be Fay Rozovsky, author and consultant on health law and the *Journal's* legal writer along with her husband, Lorne Rozovsky. As guest speaker, she will discuss "Quality Assurance and Risk Management in the Operating Room." Other topics include:

- Substance Abuse: Detection, Prevention and Treatment
- Assisting with Anaesthesia: Perioperative Nursing Roles
- Caring for the Patient with AIDS
- Other agenda subjects to be named later

PERIOPERATIVE NURSING

FROM NOVICE TO EXPERT

There will also be an exhibition of medical/surgical products. The last M.O.R.N.A., Conference held in 1987, had over 35 companies participating as exhibitors. Over 130 delegates were in attendance, a number of them from outside Manitoba.

Delegates and prospective exhibitors interested in more details or wishing to pre-register are asked to contact: Bev Popowich, Co-ordinator, O.R., Misericordia General Hospital, 99 Cornish Avenue, Winnipeg, Man. R3M 1E2 (204) 774-6581.

RECOMMENDED TECHNICAL STANDARDS

Operating Room Nurses Association of Canada

$20.00 per copy

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Direct payment & orders with return address to:

ORNAC Recommended Technical Standards
c/o Valerie Shirreff, Unit Administrator
Mississauga Hospital
100 Queensway West
Mississauga, Ontario
L5B 1B8

Calendar of Events

March 19 - 22, Edmonton, AB: 12th National Conference of the Canadian Orthopaedic Nurses Association (CONA), Westin Hotel, Edmonton. (Contact Clarece Mather, Conference Chairperson, 21423 Township Road 522, Sherwood Park, Alberta T8E 1E1 Res. (403) 922-3856; Work address: Walter Mackenzie Centre, Station 3F4, University of Alberta Hospitals, 8440 - 112 Street, Edmonton, AB T6G 2B7)

April 23 - 26, Toronto, Ont.: First Provincial Conference, Operating Room Nurses Association of Ontario, Constellation Hotel, Dixon Road. (Details, Hilda Gatchell, Publicity Convenor, 208 Oshawa Blvd. North, Oshawa, Ont. L1G 5S9).

June 1 - 3, Corner Brook, NFld.: 10th Annual Conference, Newfoundland & Labrador Operating Room Nurses Association, Glynmill Inn. (Contact Angela Lemoine, PR and Hospitality, P.O. Box 67 W.E.P.S., Corner Brook, Nfld., A2H 3J0).

June 11 - 13, Winnipeg, MB.: 3rd Biennial Conference of the Manitoba Operating Room Nurses Association, Delta Hotel. (Contact Bev Popowich, Coordinator, O.R. P.A.R. and Day Surgery, Misericordia General Hospital, 99 Cornish Ave., Winnipeg, Manitoba R3M 1E2 (204) 774-6581).

Aug. 28 - Sept. 1, Vienna, Austria: Sixth World Conference of Operating Room Nurses, Austria Centre, Vienna. (Details, AORN Meeting Services Department, 10170 East Mississippi Ave., Denver, Colorado 80231).

September 28 - 29, North Bay, Ontario: 15th Annual Conference, Northern Ontario Operating Room Interest Group (NOORIG). (Contact Mary Rankin, Communications, NOORIG, 750 Scollard Street, North Bay, Ontario P1B 1C1).

October 4 - 6, Montreal, Quebec: 23rd Annual Provincial Conférence, L'association des infirmiers(es) des salles d'opération du Quebec, Centre des Congres de Laval a Laval, Montréal, Que. (Contact Monique Dugay, Hop. Général LaSalle, 8585 Terrasse Champlain, LaSalle, Que. H8P 1C1, 365-1510).

Oct. 19 - 22, Medicine Hat, AB.: Annual Provincial Conference, O.R. Nurses of Alberta, Medicine Hat Lodge/Medicine Hat Cypress Centre. (Contact Margery Ensminger, 1989 Conference, 340 14th St. N.E., Medicine Hat, AB. T1A 5V8 (403) 527-2122).

April 2-6, 1990, Toronto, Ontario: The 11th National Operating Room Nurses Conference, Harbour Castle (Westin) Hotel. (**Delegates** contact: Audrey MacDonald, OR, Mount Sinai Hospital, 600 University Ave., Toronto, Ont. M5G 1X5. **Exhibitors** contact Valerie Shirreff, O.R., Mississauga Hospital, 100 Queensway West, Mississauga, Ontario L5B 1B8).

Introductory guidebook on lasers and laser surgery available

A simple introductory guide for gynecologists and nurses new to lasers and laser surgery is now available. Co-authored by Dr. V.C. Wright, a clinical professor in the department of obstetrics and gynecology at the University of Western Ontario, *The Gynecologist's Guide to CO_2 Lasers* defines fundamental laser principles, describes laser instrumentation and operating characteristics, and explains surgical principles clearly and concisely.

In addition, criteria are suggested for choosing a model of laser based on both surgical needs and the needs of attending staff in the hospital or clinic.

The cost of the 50-page, illustrated guide is $9.95, plus $3.00 postage and handling. To order, write: Biomedical Communications, P.O. Box 224, Komoka, Ontario N0L 1R0.

General Journal Information

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The Canadian Operating Room Nursing Journal is published by Health Media Inc, 214 Merton Street, Suite 202, Toronto, Ont. M4S 1A6.

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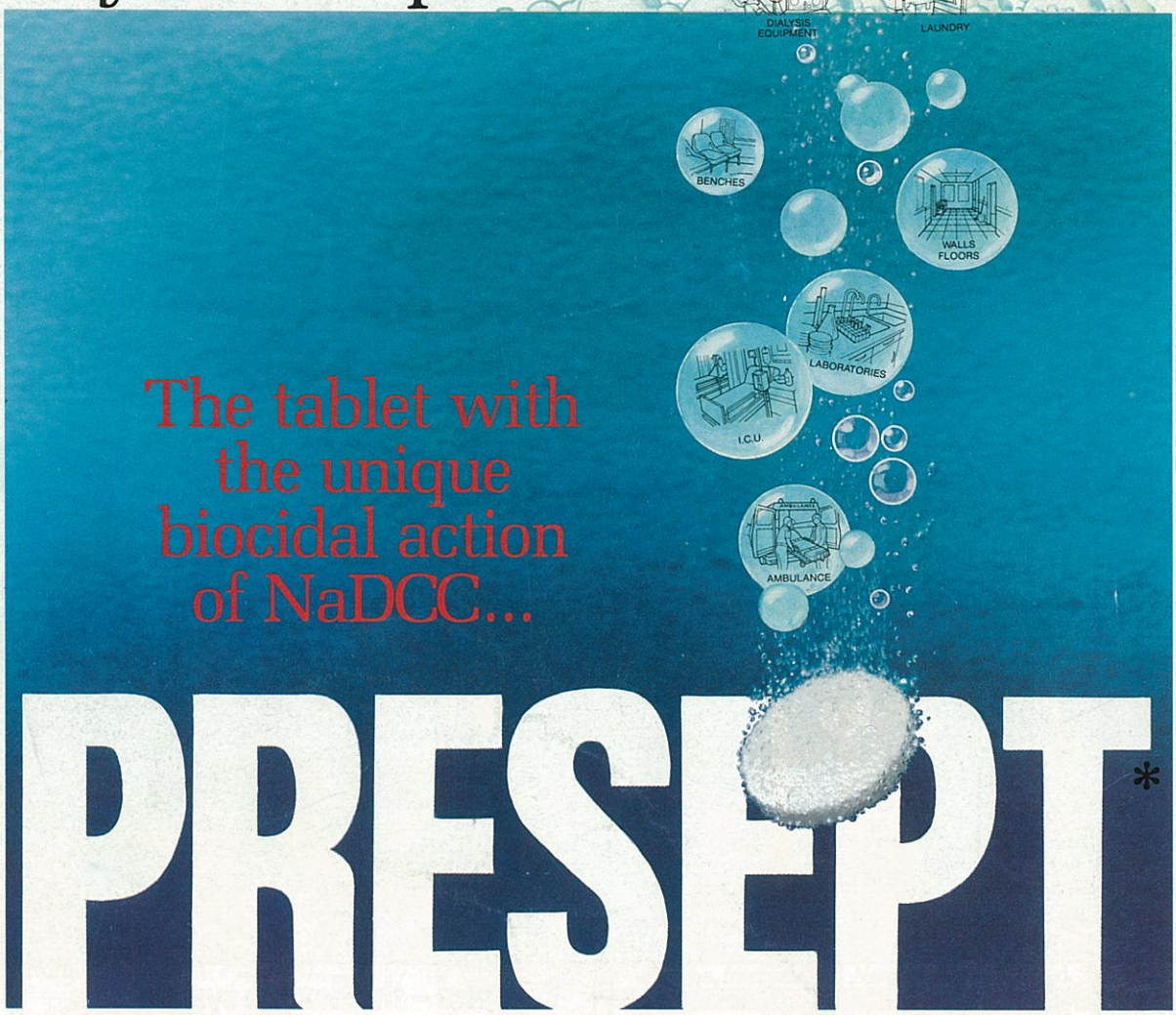

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