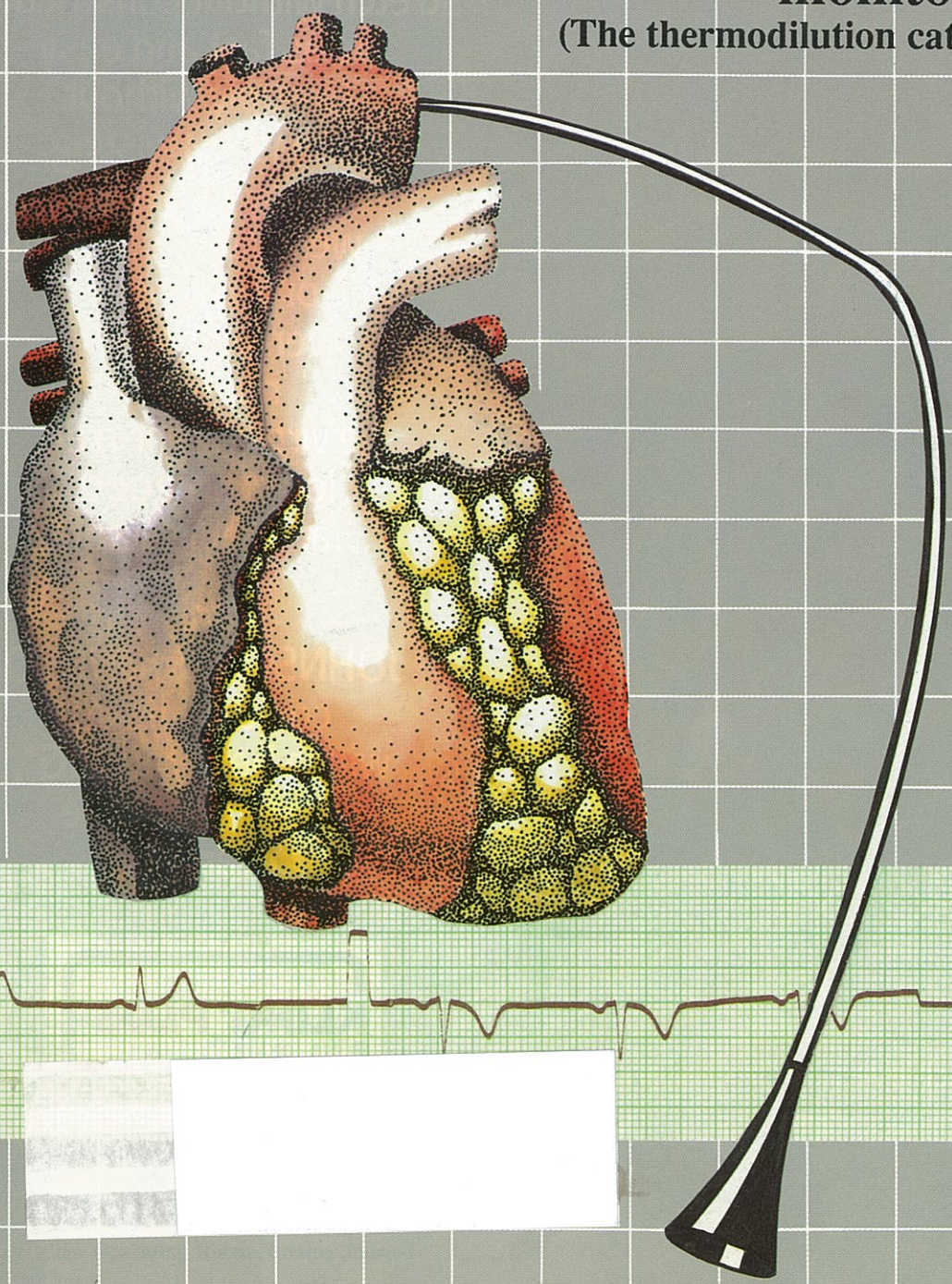
CANADIAN
Operating Room Nursing Journal
Volume 6, Number 4, September, 1988

Invasive hemodynamic monitoring
(The thermodilution catheter)



CANADIAN
Operating Room Nursing Journal

Volume 6, Number 4, September, 1988

Published by Health Media Incorporated

Canadian Operating Room
Nursing Journal
214 Merton St. Suite 202
Toronto, Ontario M4S 1A6
(416) 481-2244
(416) 483-5116

Subscription Rates:	1 Year	2 Year
Canada	$14.00	$22.00
United States	$20.00	$30.00
Other Countries	$24.00	$38.00
Single copy orders		$4.00

I.S.S.N. 0712-6778
Second Class Mail Reg. No. 5934

Feature Articles

04 Hemodynamic monitoring - the thermodilution catheter
This article is an overview of the perioperative role of the operating room nurse when dealing with invasive monitoring techniques, with specific discussion on the use of the thermodilution catheter as an aid in monitoring cardiac output.
By Jillaine Corp, R.N.

12 Hepatitis the law and the operating room nurse
There are a number of legal issues associated with hepatitis and the operating room nurse. These issues are examined by the journal's legal writers. The article also points out how legal problems involving hepatitis can be substantially reduced.
By F.A. and L.E. Rozovsky

18 10th National ORNAC Conference highlights
Highlights of the 10th National Operating Room Nurses Conference held in Vancouver May 29 to June 3 is presented. Also, a report from the new ORNAC president, Joan Donald.
By Editorial Staff

28 Steam sterilization systems (Part 2)
In the first part of this submission, we saw how the steam sterilizer works. In this second part, we move into a more in depth description of steam sterilization, primarily that which concerns safety and proper sterilization procedures.
By Barbara Bolding, R.N., B.S.N.

Departments

Calendar of Events 16
General Journal Information 16
Classified 38
O.R. News 21
Recommended Technical Standards 36

Advertisers Index

Abbott Laboratories	7	Ingram & Bell	33
Abbott Laboratories	14/15	Johnson & Johnson	IFC
Baxter Canada	8	Lac Mac	35
ORNAC Standards	31	Sancella	11
Davis & Geck	IBC	Storz Canada	5
Ethicon Limited	OBC	Trans CanaDerm Inc.	17
Euroclean Canada	37	Carl Zeiss Canada	23

Invasive hemodynamic monitoring

(The thermodilution catheter)

By Jillaine Corp, R.N.

In our role as part of the operating room team we need to be acutely aware of the importance of hemodynamic monitoring and our responsibility in helping to prepare the critically ill patient for procedures leading up to these sometimes invasive techniques.

As with anything, when an individual understands the "whys and wherefores" of different procedures and techniques, it stimulates interest and enables us to be of better assistance in the events that lead up to the actual establishment of a system - the system in this case is hemodynamic monitoring - particularly thermodilution.

The perioperative role

This article will attempt to give an overview of the perioperative role of the operating room nurse in dealing with some invasive monitoring techniques. Included in this will be various hemodynamic methods of monitoring patients and the use of a thermodilution catheter as an aid in monitoring cardiac output.

"Monitoring is not merely a process of measurement or a collection of data; it involves the analysis and interpretation of the data which has been collected."[1] The purpose of monitoring is to:

(1) identify the problem
(2) determine severity
(3) evaluate therapy

By definition, hemodynamics is the study of the movements of the blood. Advanced hemodynamic monitoring is especially important in the perioperative period because:
(1) Traditional signs and symptoms of cardiovascular failure can be hidden by anaesthesia and surgery;
(2) Cardiovascular function is put under stress by anaesthetic and surgical procedures, therefore changing the levels of hemodynamics;
(3) Hemodynamically unstable patients often have several organ systems that are impaired.

Impairment or inadequate perfusion

It is necessary to be able to distinguish between impairment caused by inadequate perfusion and impairment caused by previous disease.

The ultimate concern in any therapeutic intervention is the maintenance of oxygenation via tissue perfusion. In the critically ill, attainment of this goal is sometimes complex and elusive.

Cardiac function must be continually evaluated and optimized. To do this, there must be a way to determine how well the heart is performing as a pump. Hemodynamic monitoring provides this information directly by the measurement of cardiac output and intracardiac pressures. During surgery low cardiac output states can be encountered. It is our responsibility as operating room nurses to have the therapeutic modalities available for the anaesthetist to intervene. Consequently, we must have a

---

About The Author

Jillaine Corp R.N. is an operating room nurse at the Peterborough Civic Hospital and is in charge of the vascular theatre. A graduate of the Peterborough Civic Hospital School of Nursing and the University of Alberta Post Graduate Course for Operating Room Nurses, Ms. Corp is membership chairperson for the O.R. Nurses Association of South Central Ontario.

Measuring cardiac output with the thermodilution technique

Thermodilution is the calculation of cardiac output (CO) using temperature change as the indicator. Cardiac output is a measure of how many litres of blood per minute the left or right ventricle ejects (the CO of the left ventricle is essentially the same as the right) and is measured in litres per minute (L/M).

The normal range for CO is from 4 to 8 L/M; 5 L/M is considered the norm.

Cardiac output (CO) is a product of the heart rate (HR), multiplied by stroke volume (SV):

$$CO = HR \times SV$$

Heart rate (HR) measures how many times per minute systole occurs, the systole being that part of the heart cycle in which the heart is in contraction; that is, the myocardial fibres are tightening and shortening.

Stroke volume is a measure of how many millilitres the ventricle ejects with each systole.

Any increase or decrease in SV or HR will have an affect on the cardiac output (CO). Three factors affect stoke volume:

- the contractability of the ventricle
- the preload or filling pressure
- the afterload or the resistance the ventricle must overcome in order to empty.

Cardiac Index

Patients vary in size, thus it is difficult to compare cardiac output from one patient to another. The CO for one patient may not meet the required criteria for another patient. In order to eliminate this size variable, a cardiac index (CI) is calculated along with the CO.

The CI is the patient's CO divided by his/her body surface area (BSA). This can be obtained from the Dubois Surface Chart:

$$CI = \frac{CO}{BSA}$$

The CI designates how many litres per minute per metre squared the heart ejects. The normal CI range is from 2.7 to 4.3 L/Min./m^2. It is important to determine both CO and CI. When they are not adequate, poor perfusion to body organs/tissue can be experienced.

working knowledge of the pharmacological and physiological principles involved. Some results of low cardiac output could be:

(1) tachycardia - abnormally rapid heart action, ie., heart rate over 100/min.
(2) bradycardia - abnormally slow heart action, ie., heart rate under 60/min.
(3) ischemia/infarction of all organ systems especially cerebral, myocardial, renal and hepatic.
(4) hypotension.

Cardiac output can be determined by using pulmonary artery catheters and hemodilution techniques.

Cardial output measurements

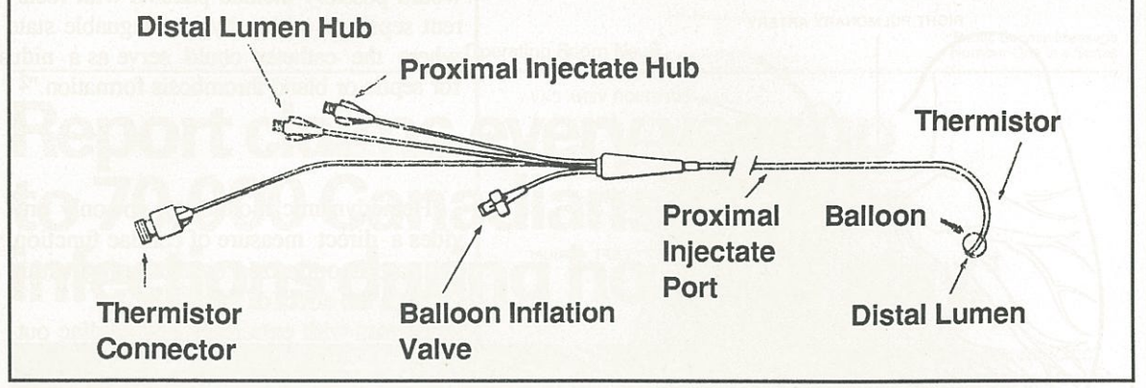
"The pressures generated by the heart cause blood to flow. The amount of blood pumped during one minute by a ventricle is called cardiac output."[2] Cardiac output is a function of heart rate and heart stroke volume. **(See box above)**

The thermodilution catheter is widely used for assessment of the cardiovascular system and cardiac output of the critically ill patient. These catheters provide the instrumentation for the detection of the temperature change necessary for cardiac output determination. Additional capabilities include intracardiac pressure measurement, blood sampling, and solution infusion. The thermodilution catheter is also a helpful adjunct in the diagnosis of ventricular septal defects, mitral regurgitation and cardiac tamponade. The use of pressure monitoring permits more accurate evaluation of and more precise therapy for the critically ill patient.

Thermodilution Technique

The process of thermodilution involves the measurement of the cardiac output by injecting a sterile solution, at a lower than body temperature, into the venous (typically right atrium) system.

Whether or not the injectate is cooled should be taken into consideration when preparing for the initial thermodilution set-up as time could be a factor in preparing for the anaesthetic set-up. (It takes approximately an extra 45 minutes when



A thermodilution (pulmonary artery) catheter

preparing the iced injectate). The procedure for cardiac output determination is the same when using iced or room temperature injectate.

"With minimal handling of the barrel of the syringe, (so as to not inadvertently warm injectate) the contents are rapidly injected as a bolus into the proximal catheter lumen, which empties into either the superior or the inferior vena cava near the right atrium or directly into the right atrium itself **(See illustration following page).** The injectate becomes thoroughly mixed with the blood by the time it reaches the pulmonary artery. The resulting blood/injectate mixture is cooler than blood alone. This temperature change is sensed by a small temperature transducer called a thermistor." 2

This thermistor is embedded in the catheter wall a short distance from the distal end. The proximal end is connected via an appropriate cable, to the recording instrument or computer. An average of three cardiac output measurements is recommended, thus allowing for the possibility of technical error.

Possible technical errors

Errors in measuring cardiac output by thermodilution can be caused by the following:

(1) the injectate gaining heat from the catheter;
(2) by warming of the syringe by handling before injection
(3) other technical errors can involve the volume of injectate and the timing of injection.

The common consequence in all of these is that they can cause the cardiac output measurement to increase or decrease. Also, thermodilution cardiac output should not be determined while cautery is applied because the electrical noise will erroneously affect the pulmonary artery baseline temperature.

Although we, as O.R. nurses, are not directly involved with the interpretation of the cardiac outputs, we should be aware of the external forces that may inappropriately influence them. Other errors could be caused by:

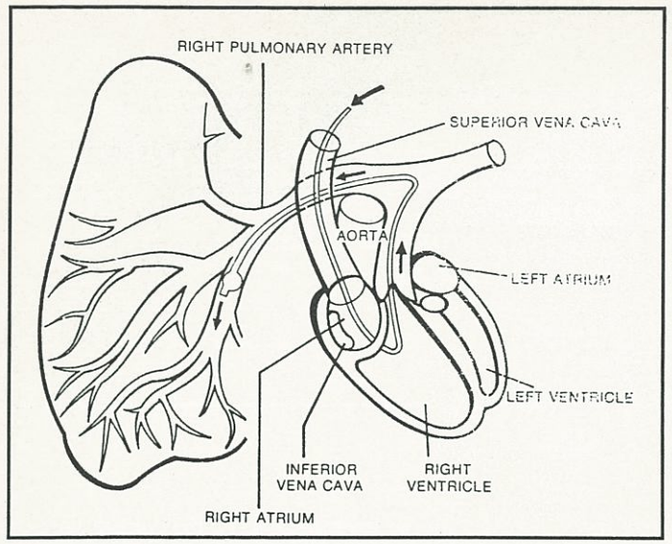
(1) poor injection techniques
(2) improper positioning of the "thermistor"
(3) variations in the cardiac rate or rhythm (for this reason ECG should be recorded during cardiac output determination)
(4) patient movement or change in position
(5) change of patient temperature
(6) change in hemodynamic state (more readily identified if pressures are recorded before and after each set of cardiac output determinations)
(7) volume of injectate-decreased volume will give a falsely high reading
(8) timing of injectate - since the ratio of venous return is changed by respiration it will alter the pulmonary artery temperature - depending on when injection is made a different cardiac output will result.

Considerations for set-up

When preparing for hemodynamic monitoring short extension tubings are advised as there is less chance of hidden areas of air bubbles. Also, disposable domes may overpressurize the transducer, resulting in constant negative drift during surgery. To prevent this, alternate snugging and loosening of the dome on transducer is advised.

A word about technique

To prevent accidental intra-arterial injections, extension tubes and stopcocks should be labeled. Always be alert and watch for clots and air bubbles in



Pulmonary artery catheter insertion

lines. Keep stopcocks capped and sterile. Disconnection may lead to hemorrhage or air embolism, so it is recommended that only LUER-LOK connectors be used. Be sure to keep catheters and lines visible.

To prevent nosocomial infection, sterile prep and gloves should be used. This helps protect both patient and anaesthetist from potentially fatal illnesses.

Take time for safety

An important part of our role in the mechanics of monitoring patients is to bear in mind that the patient has been connected safely and reversibly to a piece of equipment. As more invasive monitoring techniques are used, along with more electronic surgical instrumentation, the risk of patient morbidity related to electrical shock increases. "The utilization of non-invasive modalities whenever possible will further reduce the risk of increasing morbidity or mortality from the monitoring process itself. This may be due to electrical hazards, or other dangers such as infection."[1]

The need for regular routine inspection and maintenance is essential in order to ensure that monitoring equipment functions reliably, accurately, and safely. Cost allowance for this must be included as part of the hospital budget. Neglect of this policy invites legal action, with far greater costs.

Contraindications

"There are no absolute contraindications to the use of floatation catheters - such as those used in thermodilution monitoring. Relative contraindications would possibly include patients with recurrent sepsis or with a hyper-coaguable state where the catheter could serve as a nidus for septic or bland thrombosis formation."[2]

Conclusion

Hemodynamic monitoring not only provides a direct measure of cardiac function, but care is optimized by measuring within minutes the effect of therapy.

Patients with extremely low cardiac output are likely to be the ones who depend the most upon accurate invasive hemodynamic monitoring. Regardless of calculations, we must always be aware of the patient, not numbers at the end of cables. ■

References

(1) Hope, C., Morrison, D., "Understanding and selecting monitoring equipment in anaesthesia and intensive care," *Canadian Anaesthetists' Society Journal,* Volume 33, Number 5, September, 1986.

(2) "Understanding hemodynamic measurements made with the Swan-Ganz® catheter," Edwards Laboratories, Division of American Hospital Supply Corporation (Baxter Canada), May, 1979.

Bibliography

(1) Hug, Carl Jr. M.D., PHD., "Management of hemodynamic instability complicated by hypotension," American Society of Anesthesiologists, annual refresher course lectures and annual meeting, October, 1984.

(2) Nadeau, S., Noble W., "Limitations of cardiac output measurements by thermodilution," *Canadian Anaesthetists' Society Journal,* Volume 33, Number 6, November, 1986.

(3) Bedford, Robert, M.D. "Prevention and treatment of complications of invasive hemodynamic monitoring," American Society of Anesthesiologists, annual refresher course lectures and annual meeting, October, 1985.

Acknowledgement

Dr. J. Chirico, staff anaesthetist, Peterborough Civic Hospital, Peterborough, Ontario.

Hepatitis

The law and the operating room nurse

By L. E. & F. A. Rozovsky

With the current discussion surrounding the AIDS crisis, it is easy to forget that AIDS is not the only communicable disease which could threaten the O.R. staff. Various forms of hepatitis are more prevalent. What makes one form, hepatitis B different from AIDS is that there is a vaccine and it is not necessarily fatal. Nonetheless many issues affecting the disease and the O.R. nurse must be considered:

1. Does the O.R. nurse have a duty to the patient to be vaccinated? The answer to this question depends on whether it could be shown that a patient is at risk of contracting hepatitis from an infected staff nurse. Since this is very unlikely, there would ordinarily be no such duty. Similarly, the hospital has no duty to the patient to have its staff vaccinated unless there is a risk of exposure.

2. Do operating room nurses have a legal right to compel their employing hospital to supply them with hepatitis B vaccine? Much depends on the requirements of provincial occupational health and safety legislation and any collective agreement that requires an employer to supply a vaccine in order to provide a safe working environment. It may be argued under some legislation that the establishment of proper safety procedures may be sufficient and that hepatitis B is an inherent risk in the job of an operating room nurse.

3. Can a hospital require all operating room nurses to be vaccinated as a condition of employment? If it can be shown that vaccination is a reasonable job requirement, it can be made mandatory. To make such a requirement into a reasonable job requirement, it would be necessary to prove that vaccination of staff is of benefit to either the workers themselves, patients or other employees or members of the medical staff.

4. If a hospital has the legal right to require vaccination of all employees, who pays for it?

Much depends on the interpretation of health and safety legislation which differs from province to province (or territory) and the interpretation of the collective agreement, if one exists. Legal advice should be sought.

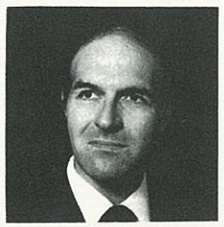
5. If the hospital does not supply the vaccine and does not require it, can an O.R. nurse refuse to participate in surgery in which transmission of hepatitis B is a threat?

The answer to this question also may differ across the country. In some occupational health and safety laws, the employee has a legal right to refuse work without danger of dismissal, on the basis that the work is unsafe. It could be argued that prior to the introduction of the vaccine, exposure to an infected patient was unsafe but an inherent risk accepted by all O.R. nurses. The vaccine, however, has changed the situation. It can be said that it is no longer an inherent risk since it can be removed. It is questionable therefore, whether a nurse who refuses to be vaccinated can refuse to work with an infected patient on the basis of a risk which can be removed.

About the authors

Lorne E. Rozovsky, Q.C., is a Halifax lawyer with the firm of Patterson Kitz, an adjunct associate professor of law and medicine at Dalhousie University and a principle in Lefar Health Associates, Inc., a management consulting firm.

Fay A. Rozovsky is president of Lefar Health Associates, Inc. and a visiting lecturer in health law at the Harvard School of Public Health. She is a member of the Massachusetts and Florida Bars.



6. Does the hospital have a duty to warn the O.R. staff of the presence of an infected patient?

A good argument can be made in favour of such a duty. Without the warning, precautions against infection may not be taken. The hospital would therefore know or ought to have known that such a warning causes precautions to be implemented and would prevent reasonably foreseeable injury. This would impose a duty on the hospital to warn the staff.

7. Does the admitting physician, the surgeon or any other physician who knows of the presence of the disease have a duty to advise the operating room staff or at least the O.R. supervisor or infection control officer?

Because of the known dangers of the disease that can be avoided or at least reduced by giving a warning, a similar duty rests with the doctor. Failure to warn the staff who would then not take ordinary precautions may result in injury. This would provide the basis of a negligence suit against the doctor for compensation.

8. Does the patient have a duty to warn the hospital that he or she is infected?

If the patient knows or ought to know that he is contagious, there is a very strong argument to be made that he has a duty to advise the hospital of that fact. The difference between such a duty on the patient and a similar duty on a doctor, is that the patient may not be expected to know that he is infected. He may honestly believe that he is not contagious. He may also believe that the hospital has already been informed of his condition.

Based on these possibilities, it would be very difficult to prove that even if the patient had such a duty, he had breached it by not informing the hospital.

9. Do staff members have a duty to one another with respect to the spread of the disease?

It is this situation which has already been dealt with by at least one Canadian court. In a New Brunswick case, the surgeon and the staff knew that the patient was infected. After using a needle on the patient, the surgeon laid it against the patient rather than handing it to the scrub nurse. The nurse failed to remove it promptly and the surgeon stabbed himself with the needle. The result was that he contracted hepatitis and was forced to give up his profession. He sued the nurse and won since her carelessness was considered negligence. The surgeon was also found partially to blame for the incident.

It is extremely important, therefore, to take all reasonable precautions when dealing with a patient suffering from hepatitis. These precautions should be geared toward minimizing the possibility of injury to other members of the operating team.

Editorial note: Many hospitals are in transition from a category-specific or disease-specific form of isolation to their own adaptation of "universal precautions" - treating **all** blood and body fluids of **all** patients as potentially infected.

Reducing the potential for legal problems

The risk of a nurse, a doctor or a patient contracting hepatitis B can be minimized. As a result, the legal problems can also be substantially reduced. The following rules may be of assistance.

1. All patients who are suspected of having a communicable disease should be "flagged" in the records as soon as the suspicion is known. The flagging should be recorded in such a way that anyone looking at the chart will immediately be drawn to it.

2. A definite infection control procedure should be implemented on the basis of the suspicion in order to confirm or eliminate it.

3. A suspicion or a confirmation of a communicable disease should automatically cause the implementation of infection control procedures with respect to the patient regardless of where the patient may be located at any particular time.

4. Staff and visitors who may be exposed to the disease should be notified of the suspicion or confirmed presence.

5. The appropriate medical and nursing staff member should be immediately notified when a suspicion is recorded to make certain that appropriate precautions are taken. ■

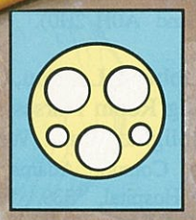
Abbott Thermodilution Catheters
Simply the right choice for the complexity of cardiac monitoring

Coiled thermistor lead
– coiled "phone cord" thermistor lead extends when stretched, to prevent shearing

Simple-to-identify leads
– each lead is a different color for easy identification

Simple bubble detection
– transparent leads and clear luer locks – easy to spot bubbles in lines

The simple Delta connector
– slim Delta connector is easy to handle, easy to tape down – not bulky
– leads are well separated – won't kink or tangle, lay flat against skin
– connector is tightly molded around leads – provides smooth transition from lumen to leads and prevents contaminants from entering lines



Round lumen and tubing construction
– round lumen provides optimum dynamic response characteristics; catheter has a precision extruded shaft with separate dedicated lumens to prevent kinking, collapsing or leaking
– "high tactile response" tubing transmits waveforms accurately

High-quality balloon construction
– high quality balloon maintains symmetrical shape

Convenient balloon port
– easy-to-use one-way stopcock

Abbott Critical Care Systems
Monitoring the future of critical care

100
Quality Health Care Worldwide
1888-1988

Calendar of Events

September 16 - 17, Regina, Saskatchewan: Saskatchewan Operating Room Nurses Group Provincial Conference, Sheraton Hotel, Regina. (Contact Ann Kristoff, 10 Dunsmore Drive, Regina, Sask. S4R 7G2 (306) 543-2175).

September 17, Toronto, Ontario: 3rd Annual Ontario Post Anaesthetic Nurses' Association Conference, Metro Convention Centre. (Doug Moore (416) 847-7100 ext. 2784).

September 30 - Oct. 1, Grand Falls, Newfoundland: 9th Provincial Newfoundland & Labrador Operating Room Nurses Association Conference, Mount Peyton Hotel. (Contact: Debi Cashin, Chairperson, 9th Annual Provincial Conference, 15 Forest Road, Windsor, Newfoundland A0H 2H0).

September 30 - October 1, London, Ontario: London & District Operating Room Nurses Association Fall Conference, Lamplighter Inn, Wellington Road, London. (Contact Connie Adams, c/o Operating Room, University Hospital, 339 Windemere Road, London, Ontario N6A 5A5 (519) 663-3310).

October 21 - 22, Hamilton Area: 4th Annual Regional Conference, Operating Room Nurses Association of Hamilton and District, Prudhommes Inn, Vineland and Q.E. Way. (Contact Gale Mitchell, Program Committee, ORNAH&D, (416) 648-8076).

November 3 - 6, Calgary, Alberta: 11th Annual Operating Room Nurses Conference, Calgary Convention Centre. (Contact Julie Matt-Hamilton, 723 Strathcona Dr., Calgary, AB T3H 1S1 (403) 242-8747.

November 4 - 5, Haliburton, Ontario: 11th Annual Fall Seminar, Operating Room Nurses of South Central Ontario, Pinestone Inn, Haliburton, Ontario. (Contact Carol Findly, Operating Room, Ross Memorial Hospital, Lindsay, Ontario K9V 4M8 ((705) 324-6111).

February 19 - 24, 1989, Anaheim, California: 36th Annual AORN Congress, Anaheim Convention Centre. (Contact Sylvia Rottman, Director of Meeting Services, AORN, 10170 East Mississippi Ave., Denver, Colorado 80231 USA).

April 23 - 26, 1989, Toronto, Ontario: First Provincial Conference, Operating Room Nurses Association of Ontario, Constellation Hotel (Dixon Road). (Further details from Hilda Gatchell, Convenor, Publicity Committee, 208 Oshawa Blvd. North, Oshawa, Ontario L1G 5S9).

June 11 - 13, 1989, Winnipeg, Manitoba: Third Biennial Conference of the Manitoba Operating Room Nurses Association, Delta Winnipeg Inn. (For details contact Bev Popowich, Co-ordinator, O.R. P.A.R. and Day Surgery, Misericordia General Hospital, 99 Cornish Ave., Winnipeg, Manitoba R3M 1E2 (204) 774-6581).

August 28 - September 1, 1989, Vienna, Austria: VI World Conference of Operating Room Nurses, Austria Centre, Vienna. (For a brochure on the conference, write to AORN Meeting Services Department, 10170 East Mississippi Avenue, Denver, Colorado 80231).

April 1 - 6, 1990, Toronto, Ontario: 11th National Operating Room Nurses Conference, Harbour Castle (Westin) Hotel. (Prospective delegates contact: Audrey MacDonald, Operating Room, Mount Sinai Hospital, 600 University Ave., Toronto, Ontario M5G 1X5. Prospective exhibitors contact Valerie Shirreff, Operatig Room, Mississauga Hospital, 100 Queensway West, Mississauga, Ontario L5B 1B8).

General Journal Information

The Canadian Operating Room Nursing Journal, copyright, 1983, is published six time a year (February, April, June, September, October and December) for operating room nurses and related surgical nursing personnel across Canada.

The Canadian Operating Room Nursing Journal is indexed in *Index Medicus, the Cumulative Index to Nursing and Allied Health Literature,* and the *International Nursing Index,* United States National Library of Medicine, Bethseda, Maryland.

The Canadian Operating Room Nursing Journal is published by **Health Media Incorporated,** 214 Merton Street, Toronto, Ontario M4S 1A6 (416) 481-2244.

Health Media Inc. also publishes *Infection Control Canada, Canadian Critical Care Nursing Journal, Canadian Journal of Nursing Administration,* and *Ontario Nursing Home Journal.*

10th National Conference Highlights

Operating Room Nurses Association of Canada
Vancouver, British Columbia

With three months gone by since the nostalgic "closing ceremonies,' delegates to the 10th National operating Room Nurses Conference in Vancouver have had time to reflect on some of the highlights that were experienced.

A total of 873 delegates from across Canada and the United States registered for the five-day gathering. Close to 100 surgical supply companies took advantage of the bi-annual event as they occupied 132 exhibit booths - a number of companies for the first time introducing themselves to the medical/surgical supply market and the Canadain operating room nursing profession.

Special presentations

There were a number of special awards, presentations and personal service acknowledgements made during the conference, which took place at the Pan Pacific Hotel from May 29 to June 3.

Named winner of the 1987 Annual "Surgikos Editorial Award" was Mary Kubaseiwicz of Seven Oaks Hospital in Winnipeg. Her winning submission, for which she was awarded $2,500 and a commemmorative plaque, was entitled *"Controlling Anaesthetic Gas Exposure in PACU"* (Volume 5, Number 2, April, 1987).

A related installment entitled *"Managing Change Effectively,"* also appeared in 1987 (Volume 5, Number 4, September). This second editorial entry was an in depth commentray on the theoretical aspects of change, with the author discussing the theories of change as they applied to the changes that were described in the initial submission.

In memorium

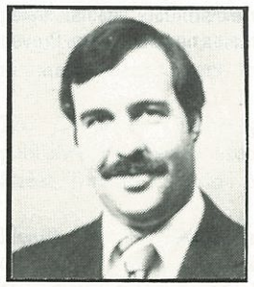
On June 2, 1983, an Air Canada jet liner bound for Toronto was forced to make an emergency landing at an airport in Cincinnati, Ohio. A fire on board, the reason for the forced landing, claimed a number of lives. Two of the passengers who lost their lives in that tragic incident were senior executives with Surgikos Canada: Christopher (Chris) Drake and Gregory (Greg) Thompson.

Drake, 33 at the time, was director of marketing for Surgikos Inc. and a member of the board of directors.

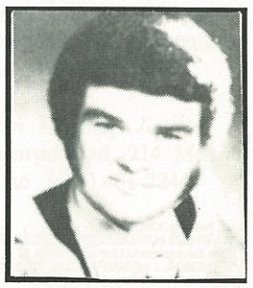
Thompson, also 33, was product director and had held a number of other key marketing responsibilitites with Surgikos. Both men were very well known to operating room nursing personnel and management across Canada.

In commemoration of their untimely deaths and for the contributions they made to Surgikos Canada, to the persuits and goals of operating room nursing in Canada and to the medical/surgical health field in which they worked, the Surgikos Editorial Award will now be officially known as the "Surgikos, *Drake-Thompson Memorial Editorial Award."*

Mr. D.M. Paterson, president of Surgikos Canada Inc. made the award presentation at the Vancouver Conference. In explaining the purpose of the name change, he said that with the annual presentation of the award in the future, "...the memories of Chris Drake and Greg Thompson will remain with those of us who had the pleasure of knowing and working with them."



Chris Drake



Greg Thompson

Isabelle Adams Award

The first winner of the "Isabelle Adams Award for Excellence in Perioperative Nursing" was presented during the Natiomnal O.R. Conference. The recipient, in recognition of contributions to operating room nursing in Canada, is selected by the ORNAC Awards Committee. Gloria Stephens, Operating Room Instructor and Inservice Co-ordinator, St. Pauls's Hospital in Vancouver, was presented with the Award. Mrs. Stephens, who was National Co-ordinator for the '88 Vancouver Conference, became the first recipient of the award.

Mrs. Stephens was one of the original members who guided the formation of the the B.C. Operating Room Nurses Group in 1964 and has served on numerous committees and in different capacities with this group, including president from 1972 to 1974. Her involvement with this organization in the development of "Standards of Patient Care in the Operating Room" in the early 70s, placed her in high profile when it came to selecting a committee to develop national operating room nursing standards. Currenly, she is chairperson of the ORNAC Standards Committee.

New executive

The Vancouver Conference was also the occasion for the introducing of a new ORNAC Executive. The new executive for 1980 to 1990 includes:

Past President - **Ann Robinson**
President - **Joan Donald**
President-elect - **Gloria Stephens**
Vice President - **Carol Lenox**
Secretary - **Muriel Shewchuk**
Treasurer - **Carole Starr**

Outgoing executive

For the outgoing executive, each of whom served in various capacities over the past five years, specially designed pins and plaques recognizing outstanding commitment to ORNAC were presented to Past-president, **Val Shirreff;** Treasurer, **Shirley Hemerling;** Secretary/national liaison, **Dorothy Orr;** and Vice-president, **Sylvia Humphries**

Position papers

At the General Meeting of the Operating Room Nurses Association of Canada, two position papers were presented. Statements, to the effect that the Operating Room Nurses Association of Canada has taken a stand on a number of issues, are to be circulated to all directors of nursing and provincial nursing jurisdictions across Canada. See the "President's Report" on page 22 for details.

ORNAC executive reports

The General Meeting of ORNAC at the Vancouver Conference also saw the various committee members make their reports to the membership. The National Conference Committee chairperson, Sharon Corbie (Scarborough Grace Hospital), announced preliminary details of the next (11th) National Operating Room Nurses Conference scheduled for Toronto in 1990. The site will be the Harbour Castle Hotel, and the dates will be April 1 to 6.

Traditionally, the National O.R. Conference is a bi-annual affair, scheduled in an even-numbered year. The ORNAC executive and board elected to move the event to an odd-numbered year. Thus, following the 1990 (11th) National Conference, the 12th National will be held in 1991 in Banff, Alberta. Quebec City has been selected for the 1993 national gathering and 1995, according to Sharon Corbie, is curently up for bid.

"Truly national affair"

The National Conference Committee also reported on the progress being made toward making the National Conference a "truly national affair," as opposed to a gathering with a noticeable provincial focus, which has been the case in the past since the organizers of the event came from the region where the event was held.

Starting with the 1990 Conference in Toronto, the transition will begin. There will be a 50/50 funding split in Toronto. This will be followed by a 70/30 funding split for the Banff Conference in 1991.

The ORNAC executive also reported on new bylaws which will see ORNAC executives change positions in non-conference years. This will ensure that a viable, working executive, board and committees will remain intact for their responsibilities in overseeing future National Conferences. The change will be automatically realized with the moving of the National Conference dates to odd-numbered years after 1990. The next ORNAC executive change-over is scheduled in 1990.

National Conference 1990

The 1990 National Operating Room Nursing Conference (the 12th) will be held in Toronto at the Harbour Castle (Westin) Hotel and Convention

Centre. Dates for the event are April 1 to 6. The following is a listing of the planning committee members who will oversee the organization of the 1990 Toronto National O.R. Conference:

- **Conference chairperson** - Sharon Corbie, Nurse Manager, Surgical Suites, Scarborough Grace Hospital, Scarborough, Ontario.
- **Publicity chairperson -** Audry McDonald, Mount Sinai Hospital, Toronto.
- **Exhibitors chairperson,** Val Shirreff, Mississauga Hospital, Mississauga, Ontario.
- **Program chairperson** - Carol Lenox, Mississauga Hospital, Mississauga, Ontario.
- **Hospitality** - Diane Jorgenson, North York General Hospital, North York (Toronto), Ontario.
- **Protocol,** Hilda Gatchell, Oshawa General Hospital, Oshawa, Ontario. ■

The lucky winner of a diamond broach was Gayle Guttormusson (3rd from left) from the Penticton Regional Hospital. She is seen with admiring co-workers and friends from the Okanagan Valley. Over 485 operating room nurses from the province of B.C. attended the conference.

Wearing their provincial tartan sashes, a group of Saskatchewan operating room nurses at the 10th National O.R. Nurses Conference in Vancouver.

Opening of exhibits at the National O.R. Conference. Gloria Stephens, conference co-ordinator and Jean Kerr, chairman of the exhibitors' committee, with Terry Murphy, president of the National Exhibitors Advisory Committee. There were over 130 exhibit booths for the 870-plus delegates to visit.

For their dedication and contributions, four past presidents of the B.C. Operating Room Nurses Group were honoured during ceremonies at the 10th National O.R. Nurses Conference held in Vancouver; from the left:

Laura Foster (1976-78)
Kay Raisbeck (1980-82)
Jean Kerr (1974-76)
Joan Burnett (1968-70)

Oral pill intake made easier with swallowing technique

The oral intake of medication, according to an article in the *New England Journal of Medicine,* Vol. 318, No. 26, June 30, 1988, is often inconvenient because of the tendency of swallowed pills, tablets, or capsules - especially large ones - to lodge in the vallecula epiglottica on their way down to the esophagus. In a letteer to the editor (page 1762), the authors draw attention to a simple physiologic maneuver that ovecomes this difficulty.

Normally, in the second stage of deglutition (swallowing), elevation of the larynx accompanied by counterpressure from the tongue, which is arched against the hard palate, helps to force the hyoid bone forward and the epiglottic tubericle backward. This distorts the base of the epiglottis and inverts the epiglottic cartilage to form a cone that caps the occluded entrance to the larynx. A loose pill on the tongue can presumably hinder the counterpressure and prevent the inversion.

Successive gulps

This problem is averted by putting the pill on the tongue and taking two successive gulps of liquid without pause. With the first gulp, the liquid only is swallowed, but not the pill. With the second gulp, the pill is swallowed with some more liquid.

The first gulp causes the epiglottis to fold down and the second washes the pill past the down-turned epiglottis. It is important, say the authors (Dr. B. Fink and Dr. C. Rohrmann, School of Medicine, University of Washington), not to pause between gulps, or the larynx will redescend and the epiglottis spring back up, thus frustrating the maneuver.

OR news

Study shows that prenatal sounds affect children later

It has been observed that there is a "quieting effect" on infants of mothers who habitually watch the "Soap Operas" on TV during pregnancy. It seems that the theme tunes from these programs are a stimulant for maternal relaxation and consequent fetal comfort, which in turn conditions the infant's response later on.

In the "Letters to the Editor" section of The Lancet, the opposite association with auditory stimuli on fetal conditioning has been reported (July 2, '88, p. 40).

During the first stage of labour before the birth of their forth child, a mother is reported to have played several games of backgammon over a few hours to help pass the time. This game produces a distinctive rattling sound as dice are thrown to the board.

For about four months after their son was born, the couple was unable to play backgammon without waking the child. Although much louder household noises would not disturb the child, the sound of the dice on the board would have him crying.

It seems that the repetition of an auditory stimulus need not be long repeated to condition a response if the sensation associated with it, in this case unpleasant, are sufficiently intense.

Manitoba PARR group wants national contacts

(MAPAN) Manitoba Association of Post Anaesthesia Nurses would like contact with other post anaesthesia nursing organizations in Canada. If you are a member of a PARR assocation in Canada and would like to initiate a "networking" program or establish a liaison with the Manitoba group, which has been in existence for a number of years now, please contact:

Patti Turnbull,
President - (MAPAN)
23 Damond Street
Winnipeg, Manitoba
R2G 2J1

Ontario planning for their first OR Conference in '89

The Operating Room Nurses Association of Ontario (ORNAO) will hold its first Provincial Conference from April 23 to 26, 1989 at the Constellation Hotel on Dixon Road in Toronto.

Because of the strongly felt need for a provincial conference in Ontario, the Ontario OR Nurses Association joined forces with the executive and organizers of the Greater Toronto Operating Room Nurses Association's Conference.

The Ontario Provincial Conference will be under the direction of a committee selected by the executive of both the Greater Toronto Group and the ORNAO:

Conference chairperson...
Jean Cunningham, (St. Joseph's Health Centre, Toronto)

Publicity convenor...
Hilda Gatchell, (Oshawa General Hospital)

Exhibitors committee...
Donna Kaufmann, (North York General Hospital)

The amalgamation of the conference and association resources of the greater Toronto O.R. group and the provincial group (ORNAO) will make this conference one of the largest regional operating room nurses gatherings in the country.

President's Report

Joan Donald
President, ORNAC

To All Operating Room Nurses in Canada:

As incoming president of the Operating Room Nurses Association of Canada (ORNAC), I wish to extend greetings to all association members and readers of the Journal.

The year 1988 has been a most productive year. Considering what has been accomplished since the formal inception of the association a half a decade ago (1983), we can all look forward to an even more interesting and eventful future as operating room nurses in Canada.

In order to keep you up-to-date on the activities of ORNAC at the national level, I thought it would be fitting to introduce your new executive. I would first like to take this opportunity to highlight some of the items of interest that originated from our last board meeting which took place May 29th in Vancouver, B.C., during the national conference.

• Technical standards

The "Recommended Technical Standards," an adjunct to the already published "Recommended Standards for Operating Room Nursing Practice," (June, 1986) has been completed. This important 114-page document, which took two years to compile, is available in English (and shortly in French). It is $20.00. Readers are asked to see page 36 for details on ordering.

The members of the ORNAC Technical Standards Committee are to be commended for the huge amount of work, sacrifice and professionalism that went into the creation of these standards.

• Awards presentations

The first recipient of the Isabelle Adams Award for Excellence in Perioperative Nursing was selected by the ORNAC 'Awards Committee.' We congratulate Gloria Stephens, St. Paul's Hospital, Vancouver, for being the 1988 recipient of this award.

Chosen winner the 'Surgikos Editorial Award' for 1987 was Mary Kubaseiwicz, Seven Oaks Hospital, Winnipeg, Manitoba. She was the recipient of $2,500 and a commemmorative plaque by Surgikos Canada Inc. in a ceremony during the Vancouver National Conference. Her winning editorial submission(s) can be found in the *Canadian Operating Room Nursing Journal,* Volume 5, Number 2, April, 1987, and Volume 5, Number 4, September, 1987.

• ORNAC position statements

In the future, the ORNAC executive and board will no doubt be called upon to take various positions of a philosophical, moral and professional nature. At our last national board meeting (May 29, Vancouver), two position papers were developed:

1. That ORNAC will be seeking CNA (Canadian Nurses Association) endorsement for operating room experience in basic nursing education programs.

2. That there will be minimum staffing requirements in the operating room: two registered nurses, one of whom must circulate. This position paper will be sent out to all the provinces.

Other topics under discussion include:

- operating room nurses as first assistants
- narcotic handling in the operating room
- consideration of lay persons being trained to replace the operating room nurse in the Province of Ontario. Operating room nurses across Canada

have been asked to report to the national executive should they hear of a similar movement in their province or region.

Past executive members

The outgoing ORNAC executive members were honoured for their contributions, accomplishments and commitment to operating room nursing in Canada during their tenure. These past executive members are:

- **Valerie Shirreff,** Mississauga Hospital, Ontario (President, 1983 - 1986) (Past-president 1986 - 1988)
- **Dorothy Orr,** Brooks Health Centre, Alberta (Secretary & National Liaison, 1983 - 1988)
- **Shirley Hemerling,** Kelowna General Hospital, British Columbia (Treasurer, 1983 - 1988)
- **Sylvia Humphries,** Western Memorial Hospital, Newfoundland (Vice-president, 1986 - 1988)

1988 - 1990 executive officers

The new 1988 ORNAC executive can boast a collective total of close to 140 years operating room nursing practice. It is also an experienced executive, as readers will note from the brief synopsis of their backgrounds.

As president of this body, I look forward to the opportunity of working with each of them, sharing with them and learning from their unique professional and association experiences. I am also looking forward to working with the various provincial representatives that make up the ORNAC board of directors.

For reader interest, the following is an information synopsis of your new ORNAC executive:

Joan Donald, President

Received her diploma in Nursing from the Victoria Public Hospital School of Nursing, Fredericton, N.B., and completed post-graduate course in O.R. Technique and Management from Royal Victoria Hospital, Montreal. She received her B.Sc.N. and B. Ed. from the University of Moncton as well as a Master of Arts (Education) from the same institution.

Joan has served on the ORNAC executive since its inception in 1983. She is a past executive member of the New Brunswick Operating Room Nurses Group as well as the Nurses Union of New Brunswick. Ms. Doanld was the original chairman of the ORNAC Standards Committe and a member of the Technical Standards Committee. Currently, she is assistant D.O.N., O.R., R.R. and Day Surgery, The Moncton Hospital, N.B. She has 20 years operating room nursing experience. **(Preceding synopsis inserted by Editorial Staff)**

Ann Robinson
Past-president

Ann has a diploma in nursing and a post-graduate course in O.R. nursing from the Health Sciences Centre, Winnpeg, Manitoba. She served as president of ORNAC from 1986 to 1988, and has been on the ORNAC executive since its inception. As well, she has served on the executive of the Quebec Operating Room Nurses Association.

Ms. Robinson sits on the educational committee for the World Operating Room nurses Conference and is currently nurse director, O.R., R.R. and day surgery, Jewish General Hospital, Montreal. Her operating room experience totals 22 years.

Gloria Stephens
President-elect

Gloria obtained her diploma in nursing from the Victoria General Hospital in Halifax, Nova Scotia. She has a diploma in adult education from U.B.C., a diploma in Health Care Management and a Certificate in Personnel Management from the B.C. Institute of Technology. She has completed the Canadian Hospital Association's Nursing Unit Administration Course and has a Certificate in Program Design and Implementation. Ms. Stephens has a total of 25 years O.R. nursing experience and is currently Opertating Room Instructor and Inservice Co-ordinator, St. Paul's Hospital, Vancouver.

Among numerous awards and professional accolades received by Ms. Stephens over the years was her recent selection as winner of the Isabelle Adams Award for Excellence in Perioperative Nursing. Since the inception of ORNAC in 1983, she has been active in various committees, including the National Standards and Educational Committee, which she has headed since 1986.

Carol Lenox
Vice-president

Carol has a diploma in nursing from the Miami Valley Hospital School of Nursing in Dayton, Ohio and a B.Sc. in nursing from McMaster University in Hamilton, Ontario. She is President-elect of the Operating Room Nurses Association of Ontario and Past-president of the Operating Room Nurses Association of Hamilton & District. She has served on the ORNAC Board of Directors for the past two years. Ms. Lenox has 18 years experience in operating room nursing and is currently Nurse Clinician, O.R., P.A.R., Day Surgery and Endoscopy at Mississauga Hospital.

Muriel Shewchuk
Secretary

Muriel received her R.N. from the University of Alberta Hospital School of Nursing in Edmonton and her B.Sc.N. from the University of Alberta. Besides taking a post-graduate course in Operating Room Technique and Management, Ms. Shewchuk studied and received her diploma in Teaching and Supervision from the University of Alberta.

Prior to her current position as D.O.N., O.R., and P.A.R.R. at the Foothills Hospital in Calgary, she was instructor in Operating Room Post-graduate Course Technique and Management, Orthopaedic and Rehabilitative Medicine, University of Alberta Hospitals, Edmonton.

Ms. Shewchuk has held a number of executive positions with the Operating Room Nurses of Alberta, and has served as a board member of ORNAC where she has chaired a number of committees. She has over 26 years experience in operating room nursing.

Carole Starr
Treasurer

Carole has a diploma from the Oshawa General Hospital and post-graduate Course Certification in Operating Room Nursing from Humber College in Toronto. She has also taken the Ontario Hospital Association's Unit Administration and Hospital Management Courses. Presently, she is taking courses towards her B.Sc. N. at the University of Ottawa.

Ms. Starr is Past-president of the Operating Room Nurses Association of Ontario and has been a member of the ORNAC Board of Directors for the past two years. Ms. Starr, with 24 years of operating room experience, is currently Unit Supervisor, Operating Room, Civic Hospital, Peterborough Ontario.

Conclusion

The national executive will be holding its next meeting in Toronto in late October. Following this meeting, I will provide an up-date to members. Readers will also be introduced to the board of directors. These are the representatives from the provinces as selected by the various provincial memberships to represent them at the national level.

Should any operating room nurse in Canada have any questions or reason to contact the national executive, please do so through your provincial representative. These provincial representatives are periodically listed in this journal.

Sincerely,

Joan Donald, President, ORNAC

Executive and Board Members, Operating Room Nurses Association of Canada (1988)

Standing back row (l-r): Marge Ensminger, Ann Hughes, Lorna Murphy, Susan Knoll, Carol Lenox, Lynne McLaughlin, Judy Wheeler, Louise Christian, Margaret Hayes. **Middle row (l-r):** Carole Starr, Mariette Forgues Guay, Heather Arsenault, Darlene Stuttard, Jackie Waisman, Deborah Roberts, Bev Popowich, Eva-Marie Lessing. **Seated (l-r):** Shirley Hemerling, Dorothy Orr, Ann Robinson, Val Shirreff, Joan Donald, Sylvia Humphries.

Planning Committee (10th National Conference) and Provincial Executive, BCORNG

Standing (l-r): Aleda Forseng, Mary Strzelecki, Carol Parker, Carol Hood, Lorna Murphy, Marg Milaney, Ellen Schrodt, Susan Wynne, Cathy Bock, Wayne Berry, Janis Cockrill, Barbara Poilievre. **Seated:** Jean Kerr, Faye Meuser, Carol Cook, Gloria Stephens, Helen Calveley, Mary Raikes-Tindle, Fran Gaudreau, Susan Knoll.

Above, Gloria Stephens with her Isabel Adams Award plaque.

Below, AORN President, Pat Hercules receives escort to podium at opening ceremony.

Above, the Zimmer fashion show. *Middle,* Joan Donald receives the President's Chain of Office from Ann Robinson. *Below,* with Dave Paterson, Surgikos President, is Mary Kubaseiwicz, the 1987 Surgikos Editorial Award winner.

Steam sterilization systems

Safety and proper processing (part 2)

By Barbara Bolding, R.N., B.S.N.

In the last issue (Vol. 6, No. 3, June, 1988) we took a look at steam sterilization systems and how they work. The basics of steam sterilization as they apply to the operating room were examined. With this as our background, we move on to a more in depth description of steam sterilization, primarily that which concerns safety and proper sterilization procedures.

Even though a sterilizer is mechanically sound and is operating correctly, there are many processing factors which can cause a sterilization failure. Safe processing requires that the following are correctly performed:

- cleaning and disinfecting
- assembling, packaging and loading into chamber
- post sterilization handling

Cleaning and disinfecting

Sterilization kills micro-organisms. However, during sterilization, any load of micro-organisms does not all die at once; it dies gradually. The higher the microbial load on any item prior to sterilization, the longer it will take to kill the entire population. If there is too high a load, not all the micro-organisms will die within the present sterilization time. It is therefore imperative that the number of micro-organisms be reduced by thorough cleaning and disinfecting prior to sterilization.

This concept has especially important implications for flash sterilization. The main reason items are "flashed" is because there is no time to send items to CSD for proper processing. The pressure to flash increases the likelihood that items may not be properly prepared for sterilization in the operating room. Most ORs lack adequate cleaning facilities, equipment, and time. The microbial load may remain high during preparation and therefore may not be totally killed during sterilization.

Assembling, packaging and loading

In preparing items for sterilization, there are a number of principles that should be followed:

- Position concave surfaces downward so that air, water or sterilant will not be trapped within the cupped surface (See figures 1 and 2 next page).
- Ensure hinged insruments are opened to expose all parts, especially box locks and jaws, to the sterilant.
- Disassemble all items, e.g. remove stylettes from fine suctions or needles, separate trocars and sheaths.
- Limit package size. The Canadian Standards Association (CSA) recommends that instrument sets have a maximum weight of no more than 15.5 pounds., and linen bundles be a maximum of 12" X 12" X 20" and weigh no more than 12 pounds. If an item exceeds these limits it is difficult to ensure that its core temperature reaches 250° or 270° F. during sterilization.

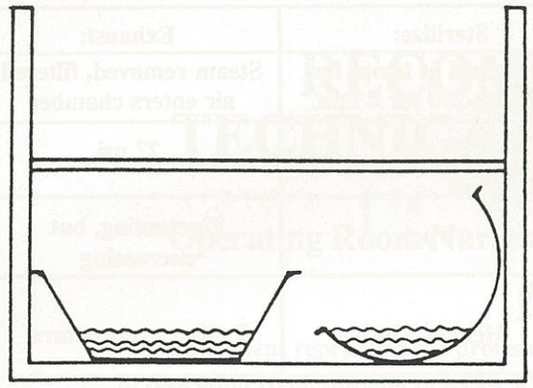
When loading the chamber, position items to allow free circulation of air and sterilant. Position them to ensure that:

- Items are not touching chamber walls, floor or ceiling.
- There is at least 2" - 4" between large packs such as stainless steel basins or major linen bundles, and 1" - 2" between smaller packs. Generally, items should not be stacked on top of one another. Place each layer on a separate shelf.
- All items are on edge. This includes linen bundles, paper-plastic peel-back packages, and stainless steel. The only exception to this are perforated or mesh bottom instrument trays which may be positioned flat. By using perforated trays and placing items on edge, resistance to the free circulation of steam from top to bottom of the chamber is minimized.

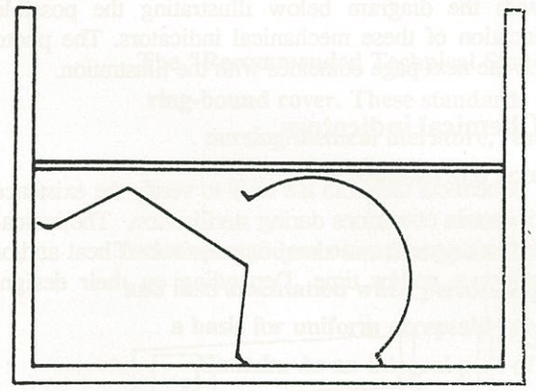
About the author

Barbara Bolding, R.N., B.S.N., studied nursing and O.R. nursing at the British Columbia Institute of Technology in Burnaby, B.C. She received her B.S.N. from the University of British Columbia.

Currently, she is co-ordinator/instructor for the Sterile Supply Processing Training Program at Vancouver Community College, as well as instructor in the Post-basic Nursing Program at the British Columbia Institute of Technology.



Incorrect positioning - air pockets are trapped



Correct positioning - air drains away freely

Post sterilization handling

If the sterility of a processed item cannot be maintained until delivery to a patient, sterilization has failed. Of course, packages that are wet, torn, unsealed, dropped, dusty or outdated must be regarded as unsterile.

Now consider the post sterilization handling of "flashed" items. How far can unwrapped items be carried (between sterilizer and sterile field) and still be considered sterile? Should they be covered while being carried? Who should retrieve them, the scrub nurse or the circulating nurse? How should this be done?

Unfortunately, there are no precise answers to these questions. Not a lot is known about the safety and efficacy of flash sterilization, and this makes it a potentially risky process. Each department must balance its own needs and physical limitations with flash sterilization's advantages and disadvantages.

Monitoring sterilization

In order to ensure patients that supplies used in their care are sterile, the sterilization process must be monitored. Monitoring can be administrative, mechanical, chemical or biological.

Written policies and procedures are examples of administrative controls. These policies and procedures can include things like dress code, routine maintenance of the sterilizer and sterilizer operating instructions. Staff education, both orientation and continuing, is also an administrative control, as is clinical supervision. Each of these requires a joint management/staff effort - management to provide the framework, staff for awareness and full participation. Administrative monitoring describes the system. The three remaining methods assess the actual functioning of the system.

Mechanical indicators

Mechanical indicators are attached to the sterilizer and show what is happening in the sterilizer at any given time. They show pressure, temperature and time. Though the indicators will not look the same from model to model, each sterilizer will have them.

Normally, there are two pressure gauges. Jacket pressure of a vacuum-assisted sterilizer should indicate 27-30 lbs. per square inch (psi) as long as the machine is turned on, whether or not a

Cycle status indicator:	Condition:	Sterilize:	Exhaust:
	Air removed, steam injected	Load held at temp. for set time-270 for 4 min.	Steam removed, filtered air enters chamber
Jacket pressure	27 psi	27 psi	27 psi
Chamber pressure	Fluctuating but increasing	27 psi	Fluctuating, but decreasing
Temperature	Rising temperature	Held at 270 F.	Falling temperature

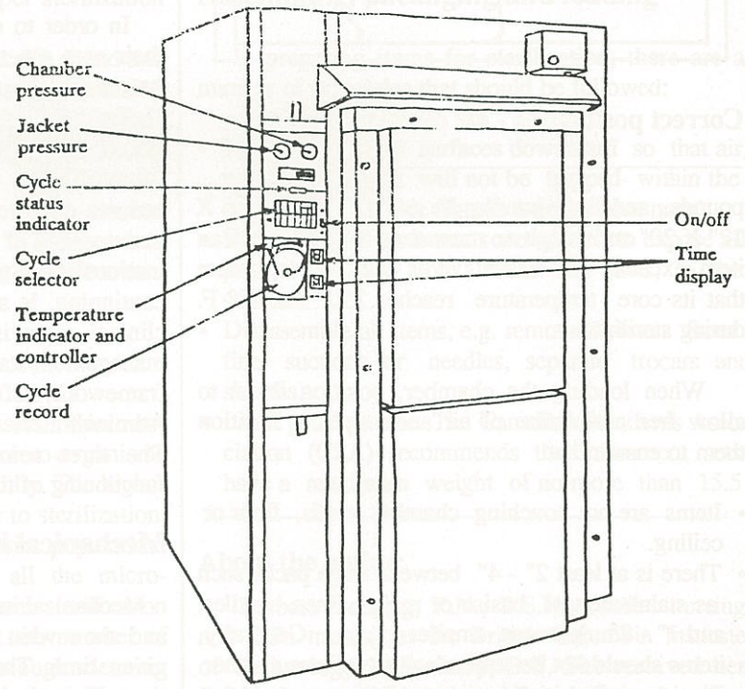
Table showing mechanical indicators

sterilizing cycle is in progress. The chamber pressure gauge will indicate 0 psi between sterilizing cycles. During sterilization, it should indicate 27-30 psi, matching the jacket pressure.

The thermometer, with its sensor located in the drain line which is the coolest part of the sterilizer, indicates chamber temperature. During sterilization it should rise to 270 degrees F. and remain there for four minutes. Associated with the thermometer are a temperature controller and chart. The controller allows the sterilizing temperature to be pre-set to any desired level. The chart provides a permanent record of the time and temperature of each cycle. The CSA requires each chart to be dated, each cycle to be verified and initialized by the sterilizer operator and each chart to be kept on file for two years.

Today, most sterilizers have a two-part automatic timing device. One part will allow the operator to pre-set the sterilizing time, usually four minutes, but this will vary with the pre-set temperature. The second part, activated during the sterilizing cycle, will indicate how much time remains in the cycle that is in progress.

Many sterilizers also have a cycle indicator. It is often a dial or a series of lights that will change in sequence as the sterilizing cycle progresses. The operator must check to see that pressure, temperature, time and the indicator correspond. The table above summarizes the mechanical indicators with the diagram below illustrating the possible location of these mechanical indicators. The photo on the next page coincides with the illustration.



Chemical indicators

Chemical indictors are used to verify the existence of certain conditions during sterilization. The indicators change in some way in response to heat and/or moisture and/or time. Depending on their design, they may change colour, melt or wick along a tube. Keep in mind that chemical change shows that the indicator was exposed, not that an item is sterile.

No item can be sterile if it was not properly cleaned and positioned for complete exposure to the

RECOMMENDED TECHNICAL STANDARDS

Published by the

Operating Room Nurses Association of Canada

This document represents the profession's responsibility to promote excellence in operating room nursing practice. The "Recommended Technical Standards" are an adjunct to the already published "Recommended Standards for Operating Room Nursing Practice" (June, 1986).

The "Recommended Technical Standards" consist of 114 pages in a sturdy, ring-bound cover. These standards are based on current nursing practice, nursing/medical literature, research, other disciplines, informed opinions and accepted past practices.

Technical standards are those practices requiring specific skills, medical devices and instrumentation when performing nursing care procedures. They provide a basis for uniform acceptable practices for operating room nurses in Canada. As an integral part of a quality assurance program, the ORNAC technical standards will contribute to the established norm in formulating the required policies and procedures, thereby improving operating room nursing practice.

$20.00 per copy

Make cheque or money order payable to:
Operating Room Nurses Association of Canada

Direct payment and orders along with return address to:

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

The ORNAC Recommended Technical Standards will be available in September in French under the title ***"Normes de Pratiques Techniques de Soins Infirmiers en Salle d'opèration***

Approved by the Executive and Board of Directors, Operating Room Nurses Association of Canada

Photo of a steam sterilizer. The mechanical indicators on the left coincide with those illustrated on the previous page.

sterilant. Most chemical indicators are not equally sensitive to all the parameters that could be monitored. Ideally, a chemical indicator for steam sterilization would indicate exposure to time, temperature, moisture and air. Most indicators on the market reflect only one or two of these parameters.

Chemical indicators are used both externally and internally. Autoclave tape and the built-in strip on paper/plastic peel-back packages are examples of external indicators. They indicate that the outside of each package has been exposed to certain conditions. Authorities (CSA, AORN, and AAMI - American Association for the Advancement of Medical Instrumentation) agree that external chemical indicators should be used on all items to be sterilized.

There is not, however, the same agreement on the use of internal indicators, i.e. those that are meant to be placed inside a wrapped package. The CSA recommends that an internal indicator be included in "each package where steam penetration is of concern," (CAN 3-Z314.3M84, Sec. 4.3.4.1.).

The AORN indicates that "a chemical indicator may be placed in packages or open trays to be sterilized," but goes on to state that the cost effectiveness of this is not proven and the reliability of indicators is not absolute. It recommends each agency formulate it's own policy (AORN III: 14-2, Recommended Practice 4). The AAMI recommend the use of a chemical indicator in "each tray or container being processed." (4.6.3.).

Biological indicators

While chemical indicators can show that an item has been processed and that certain conditions have been achieved at the location of the indicator, they do not demonstrate whether micro-organisms have been killed. The only sure way of doing that is to open a processed package, swab, then culture the contents. This is not a practical solution. Biological indicators are the next best alternative.

A biological indicator exposes a self-contained, highly resistant, non-pathogenic spore to the sterilizing cycle. Following exposure, an attempt is made to grow the spores in a warm environment (incubation). With the absence of growth, it is assumed that sterilization has been effective.

Biological indicators are usually sterilized in special test packs. This allows access to the indicator for incubation without contaminating linen bundles or instrument sets. CSA standards detail the make-up of the test bundles. The intent of the test is to challenge the sterilizer, therefore the test bundle should be as resistant to steam penetration as the most complicated item processed by the department.

When using a biological indicator to test a flash sterilizer, use the type especially designed for the flash method. Indicators designed for the testing of wrapped processing methods may give innacurate readings (AAMI Flash Sterilization, Sec. 6.4.2.). The AAMI recommends that flash sterilizers be biologically tested weekly. The indicator should be placed in an empty tray in an empty chamber. Chemical indicator is added to give immediate information about sterilization conditions (AAMI Sec. 6.4.4.2.).

Conclusion

Monitoring sterilization is not foolproof. At best, current techniques will indicate that certain conditions were attained at the location of the monitoring device. Any conclusions drawn about the processed item itself are only assumptions. Careful handling of the item before and after sterilization will help to ensure that the assumption made about it's sterility are, in fact, accurate.

For bibliography, see last issue, Canadian Operating Room Nursing Journal, Vol. 6, No. 3, June, 1988.

Tobacco chewing - more lethal than smoking

Baseball - with its hours upon hours of practicing, sitting and standing around and with only intermittent spurts of activity, albiet, highly dramatic spurts - is full of tradition and ritual. One of these rituals is the use of smokeless tobacco - snuff and chewing tobacco.

When the rules of baseball were first written in the mid-1900s, chewing tobacco was very popular. Baseball players chewed tobacco as a way of keeping their mouths moist and to produce saliva with which to soften their gloves. They also used the juice to "create" a spitball, a practice that was banned in 1920.

When it was discovered that TB was capable of being transmitted through expectorations, the practice of chewing and spitting not only became socially unacceptable, but laws were passed making it elegal in public places.

Insulated pastime

By the 1920s, the smoking of tobacco replaced chewing among the general population - but not among the baseball fraternity. Somewhat insulated from the social pressures against chewing, baseball players (professional, amateur, semi-professional, college and minor leaguers) continued to chew untill the 40s and 50s. In the late 50s, cigarette smoking replaced chewing tobacco. Unfortunately, smokeless tobacco returned to baeball in the late 70s and early 80s. The reason for this switch is attributed to the risk of cancer associated with cigarette smoking and the aggressive advertising and marketing campaigns by the manufacturers of chewing tobacco and snuff who claimed chewing was a safe alternatives to cigarettes.

Today, it is estimated that there are close to one million users of chewing tobacco in Canada. In the United States, it is estimated at over 12 million.

Two reports (among several others) in 1986, one by the Surgeon General of the United States and one by the U.S. National Institute of Health concluded that the use of smokeless tobacco is casually related to oral cancer and gum recession, that it can lead to dependence on nicotine, and that it is far from being a safe alternative to smoking.

Not only is chewing not a safe alternative to smoking, it has been shown to be more of a risk. In a study published by the Inspector General, U.S. Department of Health and Human Services, ("Youth use of smokeless tobacco: *more than a pinch of trouble,*" 1986), it makes reference to approximately 10 percent of the available nicotine (from chewing tobacco) crossing the oral mucosa barrier; thus, 2.0 to 3.5 mg of nicotine per chew (7 grams per average) enters the bloodstream of the user. This is 2 to 3 times the dose delivered by a cigarette.

If these studies are not enough to discourage the use of smokeless tobacco, the sport of baseball furnishes an outstanding example of why everyone, and not just baseball players, should break the habit. Even if one is not a baseball fan, the name Babe Ruth is synonymous with the sport. After a career marked by heavy consumption of tobacco, he acquired an oropharyngeal tumor that resulted in his death at the age of 52. The vast majority of such tumors are due to the tobacco habit.

Suggestion offered on making custom side holes on tube-drains used in surgical procedures

Tube drains are used in many different circumstances in surgery. The arrangement of sideholes, if present at all, may not be the best for the task at hand.

Custom side-holes are commonly cut perioperatively by scissors, a task that is often difficult to do neatly. A ragged hole may be left with loosely attached fragments which may remain in the patient upon withdrawal of the tube. In addition, the section of the tube that is being cut tends to spring loose and may fall into the patient being operated on.

If a bone rongeur with an oval cutting end is used, neat circular or ovoid holes can be readily and accurately punched in almost any size of tube of any flexibility. The fragment removed is held safely within the instrument's jaws and is easily extracted.

Letter to the Editor - June, 1988

I was very upset to read "entirely risk-free lipectomy procedure..." on page 42 of the April issue of the *Canadian Operating Room Nursing Journal* (Vol. 6, No. 2). This is a false and misleading statement, as I know of a patient who died from massive infection following a lipectomy.

Also, anyone associated with the field of medicine, particularly the operating room nurse, realises that no procedure is "entirely risk-free." I feel this needs to be corrected.

Gayle McMullin, Simi Valley, California

British study recommends eye protection for certain OR procedures

How important is eye protection for operating room staff? A study from the UK and reported in the February 27 issue of *The Lancet* began from the premise that O.R. workers are in close contact with body fluids, and thus the risk of contracting blood-borne infections. Not known was what procedures are most likely to lead to contamination.

To find the answer, all surgeons, operating room nurses, nursing support staff, anaesthetists and technicians in the orthopaedic and general surgery theatres at the Cardiff Royal Infirmary were provided with a 10 cm_2 target which would detect the risk of contamination by tissue and fluids. The targets, made of graph paper on a headband immediately above the eyes, were worn and changed after every operation. For O.R. workers, eyes are the most vulnerable part of the anatomy.

Target strikes recorded for 30 bone procedures

Type of bone surgery	Surgeon	Nursing personnel technicians
Hip arthroplasty	57	24
Intramedullary reaming	2	0
Sliding screw plate	12	8
Long bone compression	2	1

The targets were magnified and inspected for contamination with fluids, with the contaminants being counted: 94 consecutive operations were studied; 54 of the operations were orthopaedic (24 soft tissue and 30 bone). There were 40 general operations.

As the chart indicates, general surgery and soft tissue orthopaedic surgery carried little risk. However, operations involving bone cutting and intramedullary reaming exposed all personnel within the scrubbed field to considerable contamination risk.

The eye offers a portal of entry for infection and an abrasive mixture of bone, marrow, and blood propelled at speed by power tools and reamers could damage any epithelial surface.

Although the probability of a patient being infected is low, this probability may well rise, with the chance that a patient destined for emergency surgey may not have been tested for being HIV positive or a carrier of other lethal infections. It makes sense, concludes the author, for all O.R. personnel in the scrubbed field to wear eye protection during certain procedures such as bone surgery.

OPERATING ROOM NURSES

Toronto General Hospital is seeking qualified nurses for our 24-hour, 7 day per week, 26 room operating room suite. We need highly-motivated nurses who have at least one year of experience and who want the challenge of working in a dynamic and stimulating environment. Eleven services, including open heart, neurosurgery, microvascular surgery and organ transplantation, provide O.R. nurses with an opportunity for team collaboration and area specialization. On-site clinical teachers and active regular inservice and staff development programs ensure staff educational opportunities.

Successful candidates must have:

- Minimum one year O.R. experience;
- O.R. course or the equivalent;
- Current registration or be eligible for registration in Ontario.

If interested, please send your résumé, in confidence, to:

Personnel Department,
Toronto General Hospital,
657 University Avenue,
Toronto, Ontario M5G 1L7

TORONTO GENERAL HOSPITAL

DAWSON CREEK & DISTRICT HOSPITAL

REQUIRES A

REGISTERED OPERATING STAFF NURSE

This 77-bed acute care hospital located in the heart of the beautiful Peace River country requires the professional skills and abilities of experienced **Operating Room Nurses.**

We offer:

- Excellent opportunities to expand your skills
- Salaries - $28,932 - $33, 456 plus isolation pay of $660 per year
- Four weeks paid vacation
- Employer paid medical and dental benefits
- Accidental death and death plus Long Term Disability coverage
- Other contract benefits
- A friendly atmosphere

"We want to hear from you"

Reply to:

Mrs. A. Hendrickson, R.N., Director of Nursing
Dawson Creek and District Hospital
11100 - 13th Street
Dawson Creek, B.C. V1G 3W8
Telephone: (604) 782-8501

SOUTH MUSKOKA MEMORIAL HOSPITAL

South Muskoka Memorial Hospital, a 96-bed accredited hospital, with a 30-bed expansion approved, located right in the centre of scenic tourist country, has an opening for a full-time REGISTERED NURSE IN THE OPERATING ROOM

We offer a competitive salary and benefit package. Interested candidates that hold a current Ontario Certificate of Competence, are invited to call or submit a resume to:

Mrs. Helen Silcox, Director of Nursing
South Muskoka Memorial Hospital
P.O. Box 1570,
Bracebridge, Ontario
P0B 1C0 (705) 645-4404

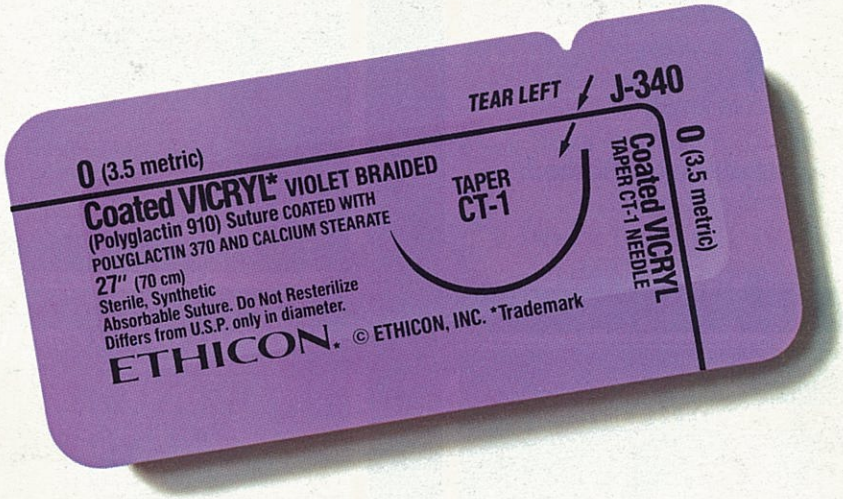
University Hospital, UBC site, is a major teaching, research and referral hospital located on the UBC Campus in Vancouver. Large enough to be a significant resource in the Province, the hospital is small enough to offer a collegial atmosphere which is highly valued by staff. A challenging opportunity exists in our Nursing Department for a:

CLINICAL RESOURCE NURSE
OPERATING ROOM

In this full-time position, you will utilize your clinical expertise in planning and implementing orientation programs, staff development programs, and quality assurance programs. You will act as a clinical resource to nurses in a variety of surgical specialties - orthopaedic sports injuries, vascular, thoracic, plastics, oral-maxillo - to ensure quality nursing practice in our five operating rooms. If you have a minimum of two years related clinical experience, demonstrated leadership ability, an aptitude for teaching and a B.Sc.N. please contact:

Anne Nickerson, Manager, Employee Relations
University Hospital, UBC Site
2211 Wesbrook Mall, Vancouver, B.C.
V6J 2B5 Telephone 1-604-228-7772
Applicants must be eligible for B.C. registration.

Why Coated VICRYL* (polyglactin 910) suture is selected more than any other synthetic absorbable



For one thing, Coated VICRYL suture has a coating that's actually impregnated into the suture. It stands up to the wet environment of surgery better than soluble coatings.

And Coated VICRYL suture has many other important properties: Smooth passage through tissue, ease of handling, knot security, and the ability to adjust knot tension for precise placement.

That is why you, our customers, have decided that Coated VICRYL suture is the best. After all, who knows better than you?

Coated VICRYL Suture

ETHICON LTD.

a Johnson & Johnson company

PETERBOROUGH, ONTARIO K9J 7B9

*Trademark