credit must go to the Chair of the Public Awareness Committee, Marg Farley from Saskatchewan, and her predecessor, Faye Meuser from B.C. for their tremendous contributions to establishing this site. It is constantly evolving and being revised as we continue to add new information and establish new links.

A **pamphlet**, developed by the Public Awareness Committee and called "Perioperative Registered Nurses - How They Care for You" was presented to the Board in May in it's third draft form. Following final feedback from Board members, it is hoped it will be approved at the Fall Board meeting for printing. ORNAC wants to make the distribution of these pamphlets to the public a major campaign in every province.

The **RN First Assistant role** is in various stages of development in every province. Some programs have been set up in individual specialties in healthcare facilities, some are being developed in colleges, and others are going through the investigative/approval processes within the provinces.

ORNAC is represented on **CSA Technical Committees**, on a steering committee to develop an International Federation of Perioperative Nurses, and on an ad hoc task force to establish stronger links between CNA and the Associate groups.

Events of the Past Year

Three executive meetings were held September 2, 1997, February 20 - 22, 1998, and May 1, 1998. **Two Board meetings** were held September 3-4, 1997, and May 2-3, 1998.

A **Strategic Plan** was developed at the February Executive meeting and presented to the Board in May. Revisions will be made, and this plan will be used as an annual reference to determine our accomplishments, areas needing improvement, and as a review of goals and objectives.

A **Telemedicine schedule** was compiled and is maintained by ORNAC providing topics, speakers and moderators.

The **Johnson & Johnson - Drake Thompson Writing Award**, in the amount of $3000, was shared this year by two perioperative nurses who submitted articles to the Canadian Operating Room Nursing Journal. These awards were presented by J & J representatives to Grace Groetzsch at the Ontario provincial O.R. Nurses Conference in Niagara Falls on May 13, and to Se uk Walling in Halifax on May 13, at an education day for perioperative nurses.

The **10th World Conference for Perioperative Nurses was held in Toronto, September 5-7, 1997.** Many ORNAC Board and Executive members attended and contributed by moderating and monitoring sessions. Canadian perioperative nurses gave the keynote and closing addresses, and many Canadian speakers were on the agenda.

Issues of Concern continue to be:

- The casual employment of perioperative RNs,
- The current shortage of experienced perioperative RNs,
- The replacement of RNs by other health care workers, both licensed and unlicensed,
- The fragmentation of the roles of perioperative RNs into tasks with little concern for quality patient care,
- Recruitment of RNs into our specialty, and
- The continued cost-cutting measures by downsizing and closures.

1998 STANDARDS NOTE

A typographical error on page 167, the position should read as follows:

Lateral Rt. - patient lying on the right side
Lateral Lt. - patient lying on the left side

The Standards Committee wishes to apologize for any inconvenience this may have caused.

Sharps Injuries & Preventive Measures

By Dr. Elizabeth Bryce, MD, (FRCPSC)

The epidemiology of sharps injuries in the operating room and possible preventive measures will be discussed in this presentation.

Why do Infection Control Practitioners focus on blood-borne disease in the Operating Room ?

• Because the OR is often ranked as number one or two in reporting of sharps injuries to the Employee Health Unit, and this is likely underreported.

• Cutaneous Exposure is of particular concern in the OR because of the high rate of exposure to body fluids and the significant number of personnel with associated dermatitis due to frequent handwashing.

• Prevention of blood-borne disease in the OR should therefore incorporate:

i) a recognition of the importance of cutaneous exposure without sharps injury and

ii) a review of methods, techniques and behaviour to minimize risk.

I would like to first present some background on common blood-borne pathogens before we discuss specific intraoperative risks and preventive measures.

Hepatitis B

The risk of acquisition of Hepatitis B with an exposure varies depending on the viral load and the presence of HbeAg. It is estimated that 4,000 to 5,000 deaths per year related to Hepatitis B occur in the United States. This should provide impetus to those who are not already immune (or a known carrier) to be vaccinated. The majority of those immunized demonstrate protective antibody titres and initial nonresponders may receive additional vaccinations in an attempt to achieve a response. If exposed, nonresponders and those whose immune status is unknown should receive two doses of immune globulin one month apart. An exposed health care worker whose serology is negative should, of course, be vaccinated as well.

Hepatitis B

- Risk of acquisition 5 - 43% per exposure.
- 6 - 10% become carriers
- Response to vaccine 90 -95%
- Vaccine provides immunity for approximately ten years.

Most employee health units will check your antibody titres at the time of exposure if you have not been checked within the last 24 months. It should also be noted that a recent article suggests that the efficacy of immune globulin may decline by day three of exposure.[1]

Hepatitis C

Hepatitis C antibody testing has only been widely available since 1991 and the prevalence in Canada is estimated anywhere from 90,000 to 300,000 cases.[2] British Columbia had 5,000 new cases in 1996 but this may have been a reporting phenomenon as the screening program had recently been implemented. The majority of cases in Canada were from injection drug users and accounted for at least half of newly documented infections.[2]

Author

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This presentation was made to the 16th BCORNG Conference in Harrison Hot Spring, BC, April, 1998.

Hepatitis C

- Previously part of non-A, non-B hepatitis
- 45% transfusion acquired, 50% injection drug users
- Risk of acquisition by sharps injury: 3 - 10%
- 5 - 25% symptomatic
- 60 - 70% develop chronic disease and 20-25% progress to cirrhosis
- No prophylactic therapy
- Exposure and seroconversion do not confer life-long immunity

Transmission of HCV after an exposure is estimated to be 3 -10% if the injected blood is anti-HCV positive. The majority of Hepatitis C patients are asymptomatic when first infected, however, over half progress to chronic disease. Between 75 to 90% of acute cases continue to carry the virus indefinitely and a health HCV carrier state has been proposed. Fifty percent of patients will present with chronic fatigue within 10 years and in about 20 to 25% of cases, liver cirrhosis will develop.[3] Currently end-stage liver disease due to HCV is the major underlying reason for liver transplantation in Canada.[4] Overall mortality is unknown as long-term data is not yet available.

At present there is no prophylactic therapy and no support for the use of immune globulin which some have theorized may prevent the development of protective antibodies. Exposure does not confer life-long immunity and one can be reinfected with a different genomic sub-type.

Human Immunodeficiency Virus (HIV)

As much has been written and presented on HIV and the risks of exposure, only a few points will be highlighted. Acquisition may be somewhat dependent on viral titre, however, this may be difficult to correlate with symptoms.[1] In a study of 148 exposures with asymptomatic HIV positive patients, none acquired infection compared to 4/889 exposures in those with AIDS which resulted in transmission of the virus.[5] The results, while not statistically significant, were provocative. The risk of acquisition is approximately one in 300 in the case of an injury involving a known HIV positive source.

HIV

- Risk of acquisition may be dependent on viral load and independent of symptoms?
- Risk of acquisition from sharps injury is approximately 0.4%
- Postexposure prophylaxis should involve at least two antiretroviral agents
- In 50 - 60% of cases, seroconversion is marked by a febrile illness

To give some perspective as to the prevalence of HIV in this province, approximately two million needles were dispensed and there were 6,000 registered addicts in British Columbia in 1996.[6] Currently the British Columbia Centres of Excellence recommends Zidovudine 200mg TID combined with Lamivudine 150mg BID for prophylaxis.[7]

Institutions in the province have been supplied with five-day starter kits and the Centre is an excellent reference source.

Risks Specific to Operating Rooms

There have been a few studies examining the risk specific to operative procedures. Gerberding performed an observational study of 1,367 consecutive surgical procedures at San Francisco General Hospital (SFGH) and examined 960 pairs of gloves.[8] She documented 117 exposures in 84 procedures, 22 of which were parenteral and 95 cutaneous. None involved the actual injection of blood and all but one laceration was deemed superficial. Almost 50% of the gloves worn for greater than three hours were perforated. No differences between specialties over time was noted but the highest rates of exposures were seen in trauma, plastics, obstetrics/gynaecology and orthopedics (No cardiac or transplant surgery is done at her institution.) The factors predictive of exposure were blood loss greater than 300 ml, a procedures greater than three hours and selected surgeries. Knowledge or perception of the blood-borne disease status of the patient did not result in a lower exposure rate.[8] A theoretical risk to surgical personnel of acquiring HIV was calculated to be 0.125 infections per year or one infection every eight years, based partly on the prevalence of HIV in their patient population. The authors believed this calculation to be relatively low because of the high compliance with double gloving in the OR, the extensive use of the no touch technique, the high infection control awareness and less frequent surgery for trauma, transplant and cardiac cases. Supporting their advocacy of double gloving was an estimation that there was a two to five times reduction in the risk of perforation of the inner glove.

Other studies have confirmed at least the same level of glove perforation rates and generally noted higher rates of exposures to blood-borne diseases.[9,10] Other authors have stressed the role of non-intact skin

in exposures. Quebbenan emphasized that one must also consider the "strike zone" (i.e. where body fluid exposures were greatest) in applying protective barriers.[9] This varied depending on the type of surgery, for example, orthopedic cases had a much higher risk of exposure to the upper arms and lower legs. The results of nine hospitals in the EpiNet surveillance group were compiled from 1992 to 1992 for a total of 660 suture and scalpel injuries. Twenty five percent of injuries occurred while passing instruments and this increase to 35% when scalpels were involved. Many of the injuries were self-inflicted, however, 44% were related to the actions of others.

Folin and Nordstroom examined accidental blood contact during orthopedic surgical procedures and noted that in 622 instances, 82 people had 88 contacts with blood (11% of all observed procedures). Of these, 79% were contamination of skin while 13% were sharps injuries, usually involving the surgeon.[10]

At Vancouver General Hospital, we were interested in how many OR staff knew the information previously outlined and how many practiced preventive measures. In 1996, we conducted an anonymous survey and were gratified to receive a response rate of 62% of nursing staff, 50% of anesthetists and 52% of surgeons. Credit goes to the OR managers and medical director for encouraging participation in the survey and we were pleased with the frankness and honesty of the replies. The majority of nurses had spent at least two years in the OR and had an average of 18 years in health care. Less than 50% felt they had received sufficient information on body substance precautions (BSP) and blood-borne diseases, although the majority felt they understood the principles of BSP.

Questions on glove use and on what to do in the event of a sharps injury were correctly responded to 66% and 80% of the time respectively. (This is important when one considers that one fifth of the staff did not know what to do if they had an exposure.) Over half the staff was aware that passing of sharps using the no touch technique decreased the risk of a sharps injury, however, only 38% always practiced the technique. Fifty six percent understood that double gloving decreased the risk of cutaneous exposure to blood but less than one third of that number regularly double gloved. Other questions on the prevention of risk had variable responses.

Preventive Measures

I am a strong proponent of double gloving although I realize that some procedures carry relatively little risk of exposure (e.g. laser eye surgery). However, I believe it is a good idea to develop the habit of double gloving. A small glove over a larger glove seems to give better dexterity and most surgeons state that they had minimal to no loss of dexterity when double gloving in this manner.

Other protective attire needs to be mentioned. For example, there are reusable gortex or microfibre gowns. There is a wide variety of protective eyewear from glasses with side shields to face shields, some of which have detachable masks. Footwear is often not considered but some procedures have significant blood pooling. In addition, there is also the risk of dropping a sharp instrument and injuring oneself. I believe that covered footwear should be strongly endorsed in the OR. Exhaust suits have been advocated by some, however, they are expensive, uncomfortable and are usually used only when one perceives a risk to exist. This, of course, belies the tenets of BSP which advocate treating all patients as potentially having a blood-borne disease. In addition, the risk of aerosols, causing a blood-borne disease is likely minimal. I feel their place is largely in the high risk autopsy, such as tuberculosis cases, where the risk of acquiring an airborne disease is significant, or perhaps in OR suites where airflow is suboptimal and ultra clean surgery is desirable.

Operative techniques can be used to minimize risk. These include the use of blunt needles for fascia; cutting off the needle at the end of a suture line before tying; the use of blunt retractors; and the use of staples wherever possible. These seem inherently obvious but are not consistently practiced. Scalpel removal devices are on the market as well as specialized basins and equipment for sorting and cleaning instruments post-operatively.

The final preventive measure I wish to discuss is the use of the "no touch technique" or hands-free technique where a neutral zone is designated and sharp instruments are placed. Instruments are not passed hand to hand and verbal notification of a sharp being placed in the zone is given. Accessory items such as magnetic drapes and basins have been developed but the neutral zone can be as simple as a kidney basin or an area in the operative field. No observational studies existed until recently when Stringer followed 3,765 of 5,388 eligible surgeries. The hands-free technique was used 72% of the time, 50% some of the time and never in 8% of cases. The overall glove tear rate was 4%. Calculation of the risk of contamination showed a significantly decreased rate of cutaneous exposure and glove tear by 59% in surgeries with greater than 100ml of blood loss. No significant statistical association was seen with surgeries having less than 100 ml of blood loss (Stringer, B. personal communication, PhD Thesis)

Conclusion

I would encourage all personnel to report exposures in a timely fashion, to be vocal in being as assessed as soon as possible for HIV prophylaxis , and to know one's institutional policy on time-off to report an exposure and sick-time if required because of side-effects of prophylaxis. Information on reporting and treatment of exposures should be readily available and hopefully part of an orientation or in-service package. Education needs to be continuous as new products and techniques enter the workplace and new information comes to light.

I would like to conclude this presentation by acknowledging my Infection Control colleague, Ms. S. Scharf, for her active role in researching the literature and participating in the OR survey.

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