



Preventing needle-stick injury

Despite the well-known dangers of bloodborne infection, uncounted hours of education on safe work practices and improved systems for needle disposal, many health care workers in Canada injure themselves with used needles every year. Even though the risk of injury per use is low, so many needles are used in health care settings that even a very low injury rate translates into an imposing number of injuries.¹ Moreover, underreporting of needle-stick injuries is common.² Dealing with needle-stick injury is problematic. Levels of vaccination against hepatitis B in health care workers are far from adequate (Dr. Peter Barss and JC: unpublished data, 1993); HIV prevention is increasingly complicated and should be started posthaste;³ and there is no pre- or postexposure prophylaxis for hepatitis C.⁴

What about primary prevention beyond education and safer work practices? The US Centers for Disease Control and Prevention (CDC) recently published preliminary findings on whether design changes in needles reduced the risk of work injuries involving skin penetration.^{5,6}

Blunt needles for suturing

Three New York teaching hospitals collaborated with the CDC to evaluate the use of blunt suture needles in gynecologic procedures.⁶ The results are summarized in Fig. 1. During the study period, 87 percutaneous injuries oc-

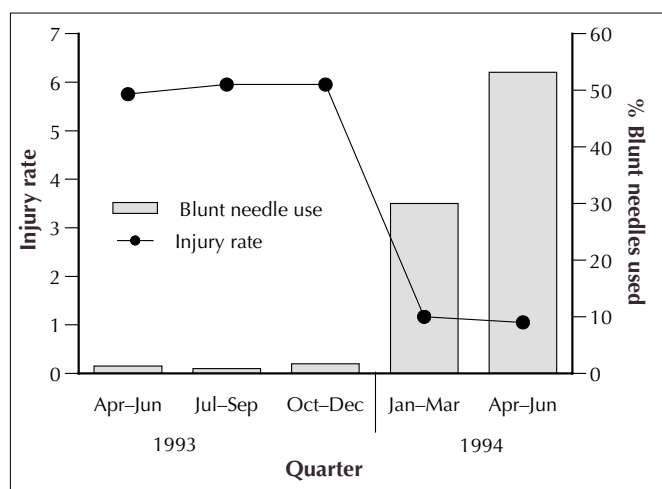


Fig. 1: Rate of injury per 100 procedures associated with the use of curved suture needles during gynecologic surgical procedures and percentage of suture needles used that were blunt, in 3 New York City hospitals. Reproduced from *MMWR* 1997;46(2):27.

curred during 84 of a total of 1464 procedures. Seventy percent of the injuries involved suture needles; of these, 92% occurred with conventional curved suture needles, 8% with straight needles and none with blunt needles. Logistic regression analysis indicated that when 50% of the suture needles used during a procedure were blunt the risk of injury from a curved suture needle was reduced by 87%.

In only 6% of the procedures in which blunt needles were used did surgeons report resulting technical difficulties; none of these was considered clinically important. Blunt needle use affected neither mean blood loss nor operative time. There was no evaluation of rates of longer-term complications such as wound infection.

Safety devices for phlebotomy needles

In collaboration with the CDC, each of 6 university-affiliated hospitals in the US evaluated 1 or more phlebotomy devices with safety features with respect to their impact on the rate of needle-stick injury.⁵ The devices evaluated were a resheathable winged steel needle, a bluntable vacuum-tube blood-collection needle activated while in the patient's vein and a vacuum-tube blood-collection needle with a hinged recapping sheath. All safety features required activation by the health care worker during or after the procedure.

Over the course of the study, nearly 4 million phlebotomies were performed with conventional devices and over 3 million with safety devices. The resheathable winged needle was associated with a 23% relative reduction in risk of percutaneous injury. The vacuum-tube systems with safety features were associated with a 76% and 66% relative reduction in risk respectively.

Based on observation of used needles in disposal containers, a substantial proportion of the safety devices were not used correctly. The safety features of 44% of the winged needles and 43% of the bluntable vacuum-tube devices were not activated. The safety feature of the vacuum-tube device with a hinged recapping sheath was activated 98% of the time.

Are engineering changes the answer?

In the phlebotomy study, the rate of injury associated with the use of conventional devices ranged from 3.6 to 4.0 per 100 000 venipunctures. Given the track record of educational programs, it seems unlikely that this rate will decrease with more education alone. Although reducing the number of phlebotomies would also decrease injuries, it is unlikely that the need for blood samples will decrease.



Engineering changes present a more promising avenue. Although some hospitals in Canada have already implemented needleless intravenous-tube connector systems, the risk of becoming infected from tubing upstream from patients is small compared with the risk posed by needles directly contaminated with blood. Concentrating on phlebotomy and suture needles makes sense.

Both blunt suture needles and phlebotomy needles with safety devices are available in Canada. Our very limited discussions with manufacturers and local surgeons indicate that they are not widely used. Cost is an issue. Although blunt suture needles are less than 10% more expensive than equivalent sharp needles, phlebotomy needles with safety devices are 25% to 50% more expensive. No doubt some of this difference in cost derives from lower demand.

The CDC studies provide an initial glimpse of interesting approaches, but many issues remain unresolved. If consumer demand increases, how much will the price fall? Why were so many devices not activated? What further ergonomic questions need to be posed, especially with regard to surgeons' acceptance of blunt suture needles? There will be few answers to these questions if we do not start using these devices more widely and evaluating their success in reducing injuries in a variety of clinical settings. The systematic prevention of any injury requires a combi-

nation of interventions aimed at all stages of the event. Nevertheless, primary prevention by such means as vaccination and engineering changes hold the most promise for reducing the risk of infection from percutaneous injury.

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References

1. Robillard P, Roy É. Blood and body fluid exposures among health care workers in acute care hospitals. In: Hagberg M, Hoffman F, Wertlander G, editors. *Occupational health for health care workers*. International Commission on Occupational Health. Landsberg (Germany): Ecomed; 1995:158-65.
2. Robillard P, Roy É. Underreporting of blood and body fluid exposures in health care settings: and alarming issue [abstract]. *Infect Control Hosp Epidemiol* 1995;16:535.
3. Patrick DM. HIV postexposure prophylaxis: new recommendations. *Can Med Assoc J* 1997;156:233.
4. An integrated protocol to manage health care workers exposed to bloodborne pathogens. *Can Commun Dis Rep* 1997;23S2:table 4.
5. Evaluation of safety devices for phlebotomy in preventing percutaneous injuries to health-care workers — Minneapolis-St. Paul, New York City, and San Francisco, 1993-1995. *MMWR* 1997;46:21-5.
6. Evaluation of blunt suture needles in preventing percutaneous injuries among health care workers during gynecological surgical procedures — New York City, March 1993-June 1994. *MMWR* 1997;46:25-9.

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