

Sharing Knowledge

What the evidence says about workplace health and safety topics in healthcare

Safer Needle Devices

A cost-benefit analysis of introducing safer needle technologies into your facility

One of the most psychologically stressful events that can occur to a healthcare worker is an injury caused by a sharp medical device. Unfortunately, these injuries are common in healthcare. A recent review of twelve hospitals across Canada found there were a total of 2621 occupational blood and body fluid (BBF) exposures reported over a two year period – 65.7% of these were due to needlesticks¹. Such exposures are a concern due to their potential to transmit bloodborne infectious agents such as Hepatitis B and Hepatitis C viruses and Human Immunodeficiency Virus (HIV).

The costs and benefits of safer needle devices

One way of reducing the high rate of needlestick injuries in healthcare is by introducing safer needle devices. However, the product price of safer needle technologies is typically higher than conventional needle devices. This can appear to pose a serious financial obstacle to healthcare organizations that wish to introduce these safer technologies.

Looking strictly at product price, however, does not give a complete picture of the costs and benefits associated with safer needle devices. Detailed cost-benefit analyses demonstrate that adopting safer needle devices presents a cost-savings that, over the long term, outweigh the initial expenditure.

A cost-benefit analysis needs to include not only the costs of the new products and the cost of staff training, but also the cost savings. Factors that need to be considered include:

- Additional costs for the safe needle devices;
- The degree to which they reduce the risk of needlestick injury; and



An example of safer needle technology. After the needle has been used, the plunger is pressed and the needle retracts, thereby reducing the potential for an accidental poke.

- Direct and indirect costs of post-exposure treatment².

Cost saving factors may include, but are not limited to:

- Decreased “downstream” costs, e.g. the cost of sharps disposal;
- Decreased nursing time for procedures as a result of product use; and
- Avoidance of needlestick injuries (These include the direct costs associated with general needlestick injury follow-up, estimated at approximately \$500 CDN per needlestick injury. If the exposure is determined to be high risk, e.g. known/suspected infected source, prophylaxis must be provided and the cost of these drugs is approximately \$1500 CDN^{3,4,5}).



Occupational Health Safety Agency for Healthcare in BC (OHSAH)

OHSAH works to reduce workplace injuries and illness in healthcare workers and return injured workers back to the job quickly and safely. OHSAH is committed to putting evidence-based information into the hands of workers, managers, and other decision-makers to facilitate informed decisions about improving workplace health and safety.

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Other costs may also be reduced, but it is difficult to quantify these because they are highly dependent on specific situations. Some examples include:

- Medical treatment costs for healthcare workers who become infected after sustaining a needlestick injury;
- Wages and time lost by these workers;
- Compensation claims costs (If there is time loss, the cost in BC averages \$6000 not including the cost of prophylactic drugs⁶);
- Emotional distress suffered by injured workers, their colleagues, and family members;
- Reduced quality of life; and,
- While rare, lives lost².

Case Studies

A study conducted in a tertiary care hospital where a needleless intravenous access system replaced traditional heparin-lock intermittent intravenous devices found that the new system was 78.7% effective in reducing intravenous line-related needlestick injuries. There was an overall reduction of 43.4% in total needlestick injuries from all procedures and events. The cost to the hospital was estimated to be between a 5.3% additional cost to a 5.7% savings within one year of implementation. It could be expected that the cost savings would increase over time. In addition, these figures did not take into account less quantifiable benefits associated with avoidance of needlestick injury, time saved by using the new product, and a decreased infection rate⁴.

In another study, Wilner et al. used the value chain approach to conduct a cost-benefit analysis for replacing conventional needles with a retractable

To date the WCB of BC has accepted one fatal claim for a healthcare worker who died as a result of occupational exposure to HCV. There are currently 7 healthcare workers with claims for occupationally acquired HCV, and one with a claim accepted for occupationally-acquired HIV.

needle device. When downstream costs were factored in, the total cost of the safety needle was calculated to be \$0.60 compared with \$0.85 for the conventional needle, a savings of \$0.25 per needle^{3,7}.

Conclusion

There is a significant amount of evidence on the cost-benefit of implementing safer needle devices in the healthcare industry. It should also be noted that researchers have found needlestick prevention activities are often enhanced by implementation of a comprehensive BBF exposure prevention program, where implementation of safer needle devices represents one of the exposure control elements. Other key elements include worker education and training, safe work procedures and practices, and exposure tracking and evaluation⁷.

References

¹ Health Canada. Update surveillance of healthcare workers exposed to blood/body fluids and blood borne pathogens: 1 April, 2000 to 31 March, 2002. Canada Communicable Disease Report (2003) Dec (29)24: 209-213.

² Heinrich J. Letter to United States General Accounting Office re: Occupational Safety: selected cost and benefit implications of Needlestick prevention devices for hospitals. <http://www.jr2.ox.ac.uk/bandolier/booth/needlestick/GAO.pdf> (2000) Retrieved (June 1, 2004).

³ Wilner NA. Using a value chain approach for effective decision making. Journal of Healthcare Resource Management (1997) pp 20-22.

⁴ Yassi A, McGill ML, Khokar JB. Efficacy and cost-effectiveness of a needleless intravenous access system. American Journal of Infection Control (1995) Apr 23;(2):57-64.

⁵ St. Paul's Centre for Excellence in HIV/AIDS

⁶ Workers' Compensation Board of BC

⁷ Tan L, Hawk JC, Sterling, ML Report of the Council on Scientific Affairs: preventing needlestick injuries in healthcare settings. Arch Intern Med (2001) Apr 9;161(7):929-36.



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ABOUT THIS DOCUMENT

The Occupational Health and Safety Agency for Healthcare (OHSAH), which operated from 1998-2010, was a precursor to SWITCH BC. Conceived through the Public Sector Accord on Occupational Health and Safety as a response to high rates of workplace injury, illness, and time loss in the health sector, OHSAH was built on the values of bipartite collaboration, evidence-based decision making, and integrated approaches.

This archival research material was created by OHSAH, shared here as archival reference materials, to support ongoing research and development of best practices, and as a thanks to the organization's members who completed the work.

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