

# STOP STICKS: REDUCING THE RISK OF NEEDLESTICK INJURIES IN PARAMEDIC PRACTICE

Authors

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## Introduction

At any moment while performing patient care duties, paramedics are at risk of exposure to blood and infection from blood-borne pathogens such as human immunodeficiency virus (HIV), which causes AIDS, hepatitis B virus (HBV), and hepatitis C virus (HCV). According to Public Health Agency of Canada, in 2014 a total of 65,040 Canadians were infected with HIV with one in five unaware that they had contracted the virus. In 2015 2,096 individuals were newly diagnosed. Furthermore, in 2011 461,000 Canadians had a history of HCV with 220,000-246,000 chronically affected.(1,2)

Unlike many other health care professionals, paramedics work in ever changing environments such as an accident scene, locations with limited visibility or space, and most commonly, in the back of a moving ambulance. A paramedic's scope of practice includes administering medications via injection, blood glucose sampling, and in some services, IV cannulation. Patient condition can be unpredictable as they may be disoriented, violent, experiencing uncontrollable haemorrhaging, or may need to be resuscitated.

Paramedics are at risk of exposure to blood and other bodily fluids through a variety of mechanisms including contact with open wounds or breaks on the skin, contact with mucous membranes including splashing to the eyes, nose, or mouth, or a human bite.(3) There is an added risk of new injuries from scene hazards such as broken glass or needle stick injuries (NSI) after being used on a patient. A study surveyed 2,664 paramedics in the United States and found that over a 12 month period 538 medics had 895 exposures to blood.(4)

HIV, HCV, and HVB have all been documented to be transmitted through contact

with mucous membranes and broken skin including, but not limited to, cuts, scratches, lesions, burns, or abrasions. In terms of risk, after a NSI, there is a 6-30% chance of HBV being transferred from an infected patient. Furthermore, there is a 1.8% chance of being infected with HCV and 0.3% risk of HIV transmission after being exposed to HCV or HIV-infected blood, respectively.(4) When knowing this, it is obvious that NSI have the potential to cause detrimental and life-threatening infections.

Prevention of NSI is becoming more feasible with technology and engineering advancements. There are several devices that allow for safer needle utilization which not only protect paramedics but are also cost effective in the long run.(5)

## Safety Needles

Safety needles are divided into active and passive systems. Active safety needles require the user to manually activate the safety mechanism after an injection while passive safety needles automatically shield themselves after the injection. Sossai et al. in 2016 found that the introduction of safety devices when initiating IVs reduced NSI caused by hollow-bore needles by 47%.(6)

80% of NSI involve non-safety devices and the contributing factor to using them is whether employers provide them. Additionally, many paramedics believe that they need additional training in the use of safety devices.(3) When safety devices are the only tool made available to paramedics in the field they have no choice but to utilize them. This in combination with sufficient training can dramatically decrease the incidence of NSI while increasing paramedics' personal safety and wellbeing.

## PPE

When a patient coughs, spits, or vomits there is a potential for blood and bodily fluids to be sprayed or splashed and make contact with paramedics. The majority of these splashes to the eyes, nose, or mouth occur when personal protective equipment (PPE) is not being utilized appropriately even though 80% of surveyed paramedics stated that their employers provided safety glasses and masks.(7) Additionally, a study of volunteer Emergency Medical Technicians in Ireland found that 18% of participants did not wear gloves when performing peripheral glucometry testing despite knowledge of standard precautions.(8) 20% of paramedics believed that they need better training in how to use PPE properly, while others believe that PPE could be designed better than what is currently provided.(7)

Working in uncontrollable and less than perfect environments often leads to logistic issues in adhering to safety precautions such as wearing appropriate PPE, changing worn gloves, disposing of sharps immediately, and frequent hand washing. Nonetheless, this should not deter paramedics from striving for safety standards and precautions to protect themselves at all times from unknown communicable diseases.(9) Ideally, employers should provide paramedics with appropriate, high-quality PPE while continuously encouraging its use. Basic PPE should include gloves, face shields and masks, safety goggles, impermeable gowns, and extrication clothing. While regular training on proper PPE use should be implemented and monitored by management.

## Reporting

Exposures go underreported the majority of the time. Paramedics are more likely to report NSI if the puncture wound is deep, but often

disregard reporting more superficial injuries. Only 49% of total exposures are reported, with 29% of exposures to broken skin and 72% of NSI reported to management. The main reason that paramedics do not report exposures is due to the fact that they are not perceived as significant or serious enough to justify reporting. Other reasons include being too busy or not knowing how to go through with the reporting procedure. Moreover, NSI go unreported a significant amount of time when paramedics believe the exposure was their own fault and do not want to appear careless.(4)

It is crucial that exposures are reported and medically assessed as soon as possible after the incident. Paramedics who do not seek medical evaluation and treatment are at risk of sero-conversion and mortality. Post-exposure prophylaxis with antiretroviral medicines should be started as soon as possible and for some such as HIV, initiation within the first few hours is preferred. If a paramedic is infected on the job and remain undiagnosed not only is their own well-being at risk, but they are putting others that they are in contact with at risk as well. Moreover, it may make paramedics ineligible for worker's compensation if the exposure is not documented as occurring in the workplace.(4)

When employers are aware of injury statistics within their service they are more likely to execute prevention strategies and techniques such as introducing superior or additional PPE, safety needle devices, implementing specific training and safety practices, and creating better blood borne pathogen standards. It is essential that NSI policies are introduced in paramedic services nationally. Additionally, thorough training on dealing with NSI and how to properly report exposures is paramount. Reporting should be encouraged from employees regardless of the seriousness of injury.

### What can be done?

When employers do not have accurate data on exposure incidence their incentive to employ safety devices or improve standards may decrease. Employers need to have an accurate report of how many injuries are occurring in the workplace in order to seek product upgrades and more in-depth safety education.(9)

Both employers and paramedics need to be actively involved in order to successfully decrease the incidence of NSI. Services should offer thorough training on exposure risks, NSI prevention techniques, and proper use of PPE, while allowing questions and offering clear answers. Additionally, staying up to date on new technologies and devices which improve paramedic safety is essential. This can be partly achieved by designing a plan for exposure

control, which can then be updated regularly as research findings are published. Researching patterns in exposure incidents and seeking opportunities for future prevention is imperative in reducing NSI and improving paramedic safety. Paramedics should also be continuously educated on effective extrication and management of violent or disoriented patients in order to limit new injuries which can leave them vulnerable to pathogen exposure.(4)

Paramedics can be involved in increasing safety by following safety standards and precautions set by services while actively participating in training sessions. Paramedics should be encouraged to ask questions to ensure that they know how to use safety devices as well what procedures are in place for them. Appropriate PPE should be utilized at all times and sharps should be disposed of as soon as possible in an appropriate location. Skin contact with blood and bodily fluids should be avoided and hands and arms should be thoroughly washed with antimicrobial soap or alcohol sanitizer at the least after every patient contact. When both services and paramedics do their part, NSI and exposure to bloodborne pathogens can be greatly reduced. 

### Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any employers or affiliated organisations.

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