

## *Passive safety devices are more effective at reducing needlestick injuries.*

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SHARING EXPERTISE

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Sir,

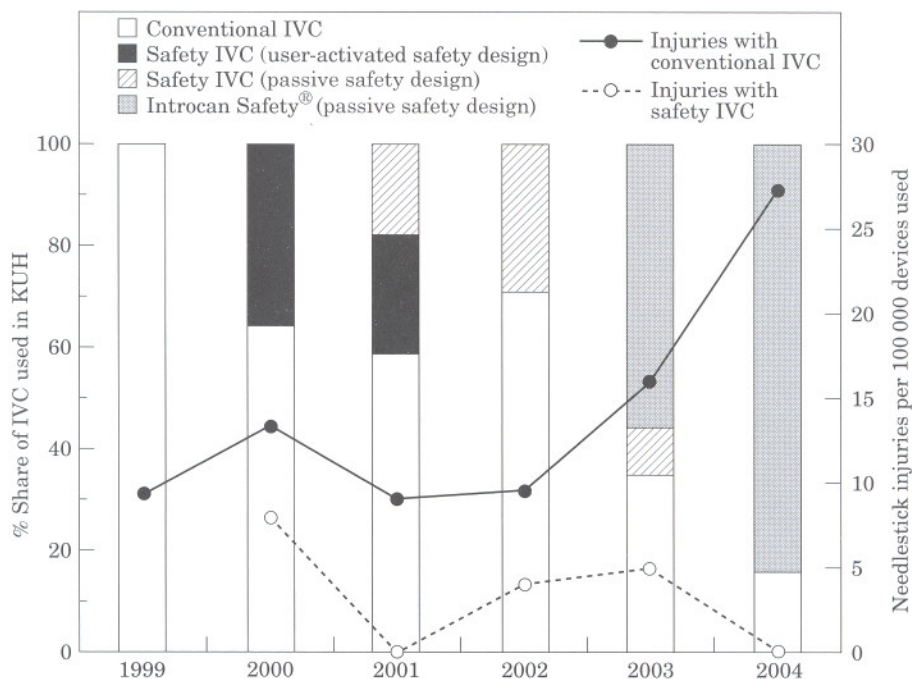
Healthcare workers (HCWs) who use or who are exposed to needles are at risk of receiving needlestick injuries.<sup>1-3</sup> Such injuries can lead to serious infections with blood-borne pathogens such as human immunodeficiency virus, hepatitis B virus or hepatitis C virus. To reduce needlestick injuries, hospitals should replace their needles with needle-free safety technology (primary prevention). Where needles cannot be replaced, a safety engineered needle that covers the sharp after use should be used (secondary prevention).<sup>2,3</sup> There are two categories of safety engineered devices: user-activated safety devices and passive safety devices. A user-activated device requires HCWs to activate a safety mechanism and cover the sharp themselves, and a passive safety device features a design that automatically covers the sharp during use.<sup>2</sup>

Kyoto University Hospital (KUH) is a 1200-bed university hospital. Approximately 90 sharps-related injuries occurred in this hospital in 1999, about 10% of which were due to intravenous cannulae (IVC). From 2000 to 2002, KUH introduced two safety IVC to prevent needlestick injuries. Injury rates with these safety devices were lower than with conventional IVC, but these safety IVC were not widely accepted (usage rate of 40% or lower, Figure 1). Therefore, the total number of needlestick injuries relating to IVC did not

decrease markedly. The Infection Control Team in KUH decided to look at newer safety technology to help with clinical acceptance and to increase the use of safety IVC. Two passive safety IVC were chosen for evaluation. Both had similar safety mechanisms; the needle tips were automatically covered with a safety clip when the needle exited the catheter hub. These two devices are very similar to conventional IVC, requiring no significant change in insertion technique; therefore, minimal training is required on how to use them. After close evaluation, Introcan Safety<sup>®</sup> (B. Braun Melsungen AG, Germany) was selected because the reliability of its safety mechanism was superior.

Introcan Safety<sup>®</sup> was introduced into KUH in 2003 and has spread rapidly with a usage rate of 84% in 2004 (Figure 1). No injuries occurred with this device in 2004 and the total number of needlestick injuries caused by IVC decreased by 62.5% when compared with the conventional device era.

When selecting a safety device, the safety mechanism should be included in the evaluation process. Passive safety devices are superior in several respects to user-activated devices.<sup>2,4</sup> Firstly, passive features are more effective in preventing needlestick injuries than devices that rely on a user-activated design. Several injuries have occurred due to non-activation and improper activation of the safety mechanism. It has been reported that there is an 85% or lower activation rate for user-activated safety devices.<sup>5</sup> Secondly, devices utilizing passive safety features are easier to use because they require no change in technique to activate the safety mechanism. Thirdly, passive designs are similar to conventional devices



**Figure 1** Trends over time in the share rate of intravenous cannulae (IVC) used in Kyoto University Hospital (KUH) and needlestick injury rate by conventional and safety IVC.

with regard to feel, length, balance and weight. Therefore, it is easier to gain clinical acceptance and product use among conservative HCWs.

However, even passive safety devices have their limitations. The passive safety IVC that was initially introduced in 2001 was not accepted by HCWs because of the slower backflow of blood into the chamber, which delayed the recognition of vein insertion. Therefore, we needed a more refined passive safety IVC. After market research, two candidates were selected and Introcan Safety<sup>®</sup> was finally chosen. To date, we believe that the introduction of Introcan Safety<sup>®</sup> has contributed to the increasing usage of a safety IVC and the reduction of needlestick injuries. We believe that the eradication of injuries due to IVC can be accomplished when Introcan Safety<sup>®</sup> has completely replaced conventional IVC.

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