

Safety IV Catheters

**B|BRAUN**  
SHARING EXPERTISE

# Needlestick Injuries

Clinical Evidence Summary



# Content Overview

## Needlestick Injuries

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1. IV catheters with a safety mechanisms display a lower risk of needlestick injuries to healthcare workers compared to non-safety/standard IV catheters

Efficacy of safety catheter devices in the prevention of occupational needlestick injuries: applied research in the Liguria Region (Italy).

Sossai D, Di Guardo M, Foscoli R, Pezzi R, Polimeni A, Ruzza L, Miele M, Ottaggio L, Fontana V, Copello F, Dellacà P. Efficacy of safety catheter devices in the prevention of occupational needlestick injuries: applied research in the Liguria Region (Italy). *Journal of Preventive Medicine and Hygiene*. 2016 Jun;57(2):E110.

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2. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Needlestick Injury Rates According to Different Types of Safety-Engineered Devices: Results of a French Multicenter Study.

Tosini W, Ciotti C, Goyer F, Lolom I, L'Hériteau F, Abiteboul D, Pellissier G, Bouvet E. Needlestick injury rates according to different types of safety-engineered devices: results of a French multicenter study. *Infection Control & Hospital Epidemiology*. 2010 Apr;31(4):402-7.

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3. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Needlestick prevention devices: data from hospital surveillance in Piedmont, Italy – comprehensive analysis on needlestick injuries between healthcare workers after introduction of safety devices.

Ottino MC, Argentero A, Argentero PA, Garzaro G, Zotti CM. Needlestick prevention devices: data from hospital surveillance in Piedmont, Italy—comprehensive analysis on needlestick injuries between healthcare workers after the introduction of safety devices. *BMJ open*. 2019 Nov 1;9(11):e030576.

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4. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Passive safety devices are more effective at reducing needlestick injuries.

Iinuma, Y., Igawa, J., Takeshita, M., Hashimoto, Y., Fujihara, N., Saito, T., ... & Ichiyama, S. (2005). Passive safety devices are more effective at reducing needlestick injuries. *Journal of Hospital Infection*, 61(4), 360-361.

# 1. IV catheters with a safety mechanisms display a lower risk of needlestick injuries to healthcare workers compared to non-safety/standard IV catheters

Sossai, D., Di Guardo, M., Foscoli, R., Pezzi, R., Polimeni, A., Ruzza, L., ... & Venturini, P. (2016). Efficacy of safety catheter devices in the prevention of occupational needlestick injuries: applied research in the Liguria Region (Italy). *Journal of Preventive Medicine and Hygiene*, 57(2), E110.

## 1.1 Topic



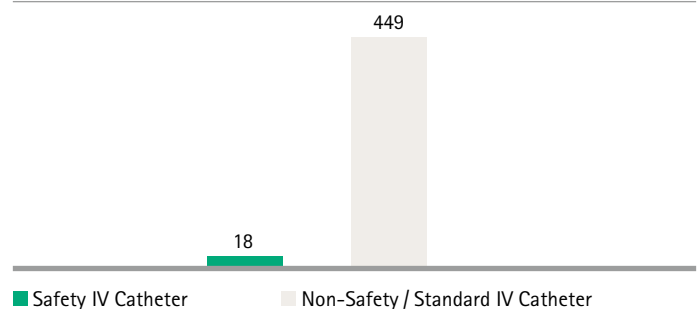
Needlestick Injuries (NSIs)

## 1.2 Design & Method

- Assessment of safety IV catheters in relation to needlestick injuries and comparison to non-safety/standard IV catheters
- Information collected on the number of needlestick injuries, respective IV catheter involved, and total number of healthcare workers employed per hospital
- **Product used:** Safety IV catheter (Introcan Safety®, B. Braun), non-safety/standard IV catheter (unspecified)
- A quasi-experimental study, a non-concurrent prospective investigation over a period of 5 years (2006–2010), in Italy
- 5 public hospitals participated
- Rate of needlestick injuries calculated based on the number of healthcare workers per year and adjusted to the total number of IV catheters used
- Statistical relevance defined by a 95% confidence interval
- Assumption that healthcare workers had been exposed to both catheter types evenly

## 1.3 Results

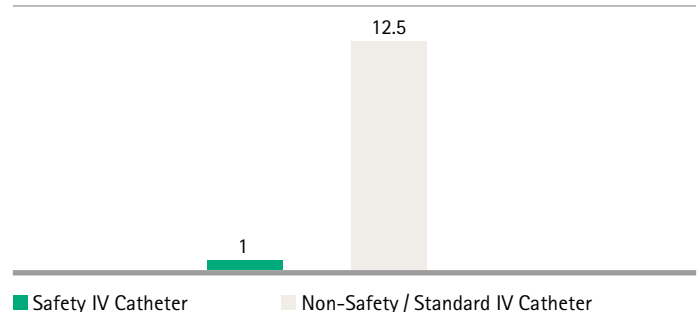
### 1.3.1 Number of needlestick injuries/100,000 healthcare workers per year:



#### Overall,

- 4.8 mil IV catheters used
- 122,464 healthcare workers (HCWs) employed
- Number of needlestick injuries (NSI): 286
  - Safety IV catheter (18 NSIs)
  - Non-safety/standard IV catheter (449 NSIs)
- **The risk of needlestick injuries by using safety IV catheters was 25 times lower** compared to non-safety/standard IV catheters

### 1.3.2. NSI occurrence rate adjusted by total number of catheters used:



- Safety IV catheter (1.0 NSI)
- Non-safety/standard IV catheter (12.5 NSIs)

## 1.4 Key Findings

The use of a **safety IV catheters significantly reduces the risk of needlestick injuries** in healthcare workers.



## 2. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Tosini W, Ciotti C, Goyer F, Lolom I, L'Hériveau F, Abiteboul D, Pellissier G, Bouvet E. Needlestick injury rates according to different types of safety-engineered devices: results of a French multicenter study. *Infection Control & Hospital Epidemiology*. 2010 Apr;31(4):402-7.

### 2.1 Topic



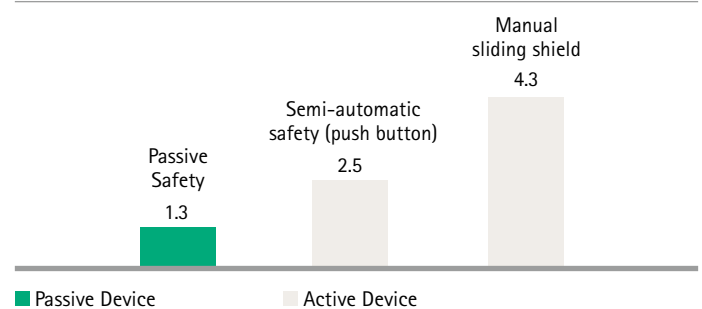
Needlestick Injuries (NSIs)

### 2.2 Design & Method

- Study compared frequency, incidence rates, and circumstances of NSIs associated with different safety devices
- Voluntary surveys filled by healthcare workers, providing information on needlestick injuries and safety devices involved
- Product used for peripheral IV access: Passive safety devices (unspecified, fully automatically activated after needle removal), semi-automatic safety devices (unspecified, manually activated by pressing a button), manual sliding shield active devices (unspecified, manually activated by sliding a sheath over the needle)
- Multicenter survey within the GERES hospital network over a period of 2 years (2005 - 2006), in France
- 61 hospitals participated; 1.8 mil units of safety IV catheters purchased during the study period
- Rates of needlestick injury based on number of safety devices purchased
- Statistical relevance defined by a 95% confidence interval

### 2.3 Results

Number of needlestick injuries / 100,000 safety devices purchased



- Passive safety devices resulted in the lowest number of needlestick injuries
- Passive safety devices were more effective than active safety devices that required a manual activation by the user
- Active safety devices resulted in almost two times more needlestick injuries or more compared to passive safety devices

### 2.4 Key Findings

- IV catheters with a **passive safety mechanism are most effective** at preventing needlestick injuries
- **Passive safety devices are proven to be better than active safety devices**
- **Passive safety devices** require **no user activation**, thus are **less complex** than active safety devices



# 3. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Ottino MC, Argentero A, Argentero PA, Garzaro G, Zotti CM. Needlestick prevention devices: data from hospital surveillance in Piedmont, Italy—comprehensive analysis on needlestick injuries between healthcare workers after the introduction of safety devices. *BMJ open*. 2019 Nov 1;9(11):e030576.

## 3.1 Topic



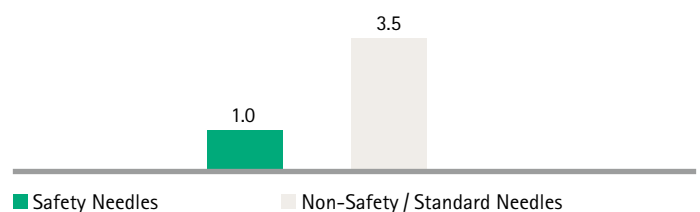
Needlestick Injuries (NSIs)

## 3.2 Design & Method

- The study analyzed surveillance data on NSIs comparing non-safety/standard and safety devices
- Secondary analysis on the correlation of needlestick injuries between active and passive safety devices
- **Products used:** butterfly needles, peripheral venous catheters, standard needles, vacutainer butterfly needles, vacutainer standard needles
- Analysis of needlestick injury reports from 42 acute care hospitals between 2014 – 2016, in Italy
- Rates of needlestick injuries (NSI) based on 100,000 devices used
- Statistical relevance defined by a 95% confidence interval

## 3.3 Results

Rate of needlestick injuries / 100,000 needles used (excl. (hypodermic needles, 2014):



- **Safety needles reduce the risk of needlestick injuries** in healthcare workers compared to the use of non-safety/standard needles
- Within the category of safety needles, **92%** of needlestick injuries occurred with an **active safety mechanism**

## 3.4 Key Findings

- **Safety devices significantly reduce needlestick injuries** compared to non-safety/standard devices
- **Passive safety devices are most effective** at preventing needlestick injuries, having the highest safety level of all devices in the market



# 4. IV catheters with a passive safety mechanism are most effective at preventing needlestick injuries compared to other safety mechanism

Linuma, Y., Igawa, J., Takeshita, M., Hashimoto, Y., Fujihara, N., Saito, T., ... & Ichiyama, S. (2005). Passive safety devices are more effective at reducing needlestick injuries. *Journal of Hospital Infection*, 61(4), 360-361.

## 4.1 Topic



Needlestick Injuries (NSIs)

## 4.2 Design & Method

- Analysis of needlestick injury reports before and after the implementation of different safety IV catheters
- **Products used:** Passive safety IV catheters (Introcan Safety®, B. Braun; unspecified, fully automatically activated after needle withdrawal), non-safety/ standard IV catheter (unspecified), active safety IV catheters (unspecified)
- Study within Kyoto University Hospital (KUH), a 1,200-bed hospital, over a period of 6 years (1999 – 2004), in Japan
- Needlestick injuries per 100,000 devices used by type of IV catheter

## 4.3 Results

- In 1999, 9 out of 90 NSIs occurred due to non-safety/ standard IV catheters
- After the introduction of active safety devices in 2000, there was a low clinical acceptance ( $\leq 40\%$  used in KUH) and only a slight decrease in number of NSIs
- Several NSIs occurred due to non-activation or improper activation of the active safety device (85% and less activated the safety mechanism)
- **After the introduction of the passive safety device/Introcan Safety® in 2004, NSIs caused by IV catheters reduced by 62.5% when compared with NSIs in 1999**

## 4.4 Key Findings

- **Passive safety devices are most effective at preventing NSIs** compared to active safety devices
- **Passive safety devices require no user activation**, thus are **less complex** than active safety devices
- **Passive safety devices are more likely to obtain clinical acceptance** compared to active safety devices



# B. Braun Safety IV Catheters

## Passive safety mechanism to help avoid needlestick injuries

The B. Braun Safety IV Catheters have a passive safety mechanism that is automatically activated once the needle is withdrawn out of the catheter hub, making reinsertion of the needle not possible.



### Passive Safety Shield

- is a passive, fully automatic protection of the needle tip
- It deploys automatically and requires no user activation
- Cannot be bypassed
- Designed to eliminate needlestick injuries and related infections<sup>1,2</sup>
- Passive Safety is most effective at preventing needlestick injuries<sup>1,2</sup>
- Passive Safety is proven to be better than a semi-automatic 'push-button' safety shield or manually sliding shield<sup>2</sup>

### Introcath Safety® – Safety IV Catheter



### Introcath Safety® 2 – Closed IV Catheter



### Introcath Safety® 3 – Closed IV Catheter



Literature: 1. Tosini W. et al. Needlestick Injury Rates According to Different Types of Safety-Engineered Devices: Results of a French Multicenter Study. Infection Control & Hospital Epidemiology. April 2010; 31(4):402-407. 2. Sossai D. et al. Efficacy of safety catheter devices in the prevention of occupational needlestick injuries: applied research in the Liguria Region (Italy). J Prev Med Hyg. 2016; 57:110-E114.





For more information, please scan the QR-code or visit:  
<https://www.bbraun.com/en/products/b/introcan-safety-w.html>