Blood release behavior of safety peripheral intravenous catheters: Mucocutaneous blood contact too small to cause hepatitis C and HIV


Abstract:

BACKGROUND: Protection against needlestick injuries has significantly improved in recent years thanks to so-called “safety devices.” However, a potential drawback occasionally reported by users is a risk of blood splashing. If this blood comes in contact with the mucous membranes, it could lead to an infection.

METHODS: Five safety peripheral intravenous catheter brands were examined in a laboratory test. To simulate the extreme situations, which may arise through human use, the introducer needle was withdrawn from the catheter at 2 different angles whereby an industrial robot was used to simulate the sequence of this movement. Each brand was tested 30 times. The experiment was carried out using radioactively labeled human whole blood. The measurements for the transmitted volume of blood was taken both from an artificial head and from a surface measuring 18.5 cm by 26.5 cm at a height of 30 cm above the catheter; scintigraphy was used to take the measurements.

RESULTS: The volume of blood droplets potentially splashing into the mucous membranes was in the range of 1 nL.

CONCLUSION: For normal virus concentrations in the blood of sick patients, this dose is too small to cause hepatitis C and HIV.