

The value of double gloving within the operating environment.



Background

Current market trends show that more and more surgeons are choosing to double glove. The reason behind this growing trend is the need for surgeons to better protect themselves against exposure to blood-borne pathogens, particularly Hepatitis B (HBV), Hepatitis C (HCV) and the Human Immunodeficiency Virus (HIV).

According to the World Health Organization (WHO), among 35 million healthcare workers worldwide, about three million receive percutaneous exposures to bloodborne pathogens each year; two million of those to HBV, 0.9 million to HCV and 170,000 to HIV.

Hepatitis B is one of the most common and serious diseases in the world. It is 100 times more infectious than HIV. According to the WHO, there are approximately 350 million chronic carriers of hepatitis B virus (HBV) worldwide. Up to 2 million people die each year from hepatitis B virus infection, making it the ninth leading cause of death worldwide.

Exposure of bloodborne infection

Healthcare workers (HCW) are exposed to blood-borne infections such as:

- Hepatitis B (HBV)
- Hepatitis C (HCV)
- Human Immunodeficiency Virus (HIV)

Infection risk

The risk for blood-borne exposure and infection is highest in the operating room¹

Average infection risk after percutaneous injury with contaminated sharp instruments varies²:

- Hepatitis B (HBV): 6-30%
- Hepatitis C (HCV): 4-10%
- Human Immunodeficiency Virus (HIV): 0.3%

Chronic HBV infection among surgeons is 3 times greater than that of general population⁴

Puncture rates of surgeon's gloves

Punctures more commonly occur without the wearer's knowledge.

Puncturing of gloves during surgical procedures has been found to occur at rates of 11 – 43% depending on the surgical procedures being undertaken. Studies have also shown that the puncture rates increase in gloves that are worn for longer than 3 hours⁷.

Perforations and the type of surgery

The nature of the operation being carried out is probably the most important factor affecting glove perforations. One such study found orthopaedic surgery to have the highest incidence of perforation closely followed by gastrointestinal surgery. Vascular, urology and thoracic surgery were found to have comparatively low perforation rates.¹³

Breach of glove barrier

In many cases the breaching of the glove barrier is not discovered until the gloves are removed and blood is noted on the hand. Studies by Dodds et al^{8,9} have demonstrated that this occurs as much as 12% to 17% of the time. These studies resulted in recommendations that surgeons should change their gloves at least once an hour to avoid contamination with patient bodily fluids.

Visual detection of perforation

A study on the electronic evaluation of the value of double gloving concluded that without the electronic detection, a large majority of barrier breakdowns would remain undetected by the surgical team.¹⁵

The value of double gloving to increase protection

Double gloving has been shown to be an effective method to reduce the surgeons' potential for contact with bodily fluids. In a 1992 study¹⁰ it was reported that surgeons who only single gloved had a 51% hand contamination rate versus a 7% contamination rate for surgeons who double gloved.

Double gloving (wearing two pairs of gloves) significantly reduces the perforation rate of the inner glove by at least 70% compared to single gloving^{5, 11, 12, 13}

Conclusion and practical recommendations

Double gloving is a very effective method to reduce exposure to blood-borne pathogens (HVB, HCV and HIV), as it cuts down by a factor of 10 the number of potential exposures.

Routine glove changing, especially after intensive works on bones or deep procedures which carry a high risk of perforating the outmost glove, is the best way to rebuild a high level of protection provided by two gloves.

Visual detection is not a safe method to detect or limit perforation of glove barrier performance.

Double gloving is easy to implement, as the latest generation of surgeons gloves are designed to support double gloving. To balance the security of double gloving with individual needs such as comfort and sensitivity, it is recommended to test different options of double gloving to avoid hand-fatigue or other discomforts.

When double gloving, sizing of gloves depends on individual needs; today three practices are common by operating staff. (Example: Glove Size 7.5)

Size 7.5 + 7.5 - wearing two gloves with similar sizing

Size 7.5 + 8.0 - outmost glove half a size larger

Size 7.5 + 7.0 - outmost glove half a size smaller

Double gloving chart on Ansell surgeon's gloves

Type of gloves		Thickness (Finger - Single Wall) (mm)		
Gammex [®] PF * / HydraSoft [™]	Gammex [®] PF	0.220	0.220	0.440
Gammex [®] PF	Gammex [®] PF Underglove	0.220	0.210	0.430
Gammex [®] PF	Gammex [®] PF Micro-Thin [®]	0.220	0.185	0.405
DermaPrene [®] Ultra **	DermaPrene [®] Ultra	0.185	0.185	0.370

* Ansell's ENCORE or MICRO-TOUCH brands are equally designed to support double gloving

** Synthetic material tends to have a higher tear and puncture resistance compared to products made from NRL

Ansell Healthcare offers you different solutions for an effective and comfortable double gloving system based on its experience and its wide range of surgical gloves designed to support all medical applications. For further information, please feel free to contact clinical consultants and product specialists.

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Double gloving: step by step procedure



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