

WHITE PAPER

CLOSED INFUSION SYSTEMS INCLUDING ECOFLAC® PLUS IV CONTAINER PREVENT MICROBIAL CONTAMINATION

In vitro study validating the microbial barrier function of closed infusion systems against microbial touch- and airborne contamination

Dr. Jörg Brünke, QualityLabs BT GmbH, 90411 Nuremberg, Germany

BACKGROUND

Healthcare-acquired infections (HAIs) are a major problem for healthcare systems as they contribute to increased morbidity and mortality in hospitalised patients. Each year, HAIs affect millions of patients worldwide.^{1,2}

Infusion systems are widely used in daily clinical practice. Their major goals are the protection of healthcare workers against exposure to infectious agents and potentially harmful drugs, as well as the protection of patients from microbial contamination.

Infusion systems are typically expected to be closed systems. The definition of a closed system should take into account the following aspects:

- microbial aspect (preventing unfiltered air or microbial contaminant transfer into the system)
- chemical aspect (preventing the escape of a drug out of the system)
- blood aspect (preventing the escape of blood out of the system)

With respect to infection by transmission, the most clinically relevant pathways are direct contact and airborne transmission. Therefore, the microbial barrier function of infusion systems is an important aspect to consider in terms of preventing microbial ingress and nosocomial infections.

PURPOSE

The aim of this study was to investigate a complete infusion device as a closed system, in order to confirm the microbial barrier effectiveness of the connections found on a typical infusion system (B. Braun's infusion system including Ecoflac® plus IV container) that are subject to microbial exposure (touch and airborne contamination).

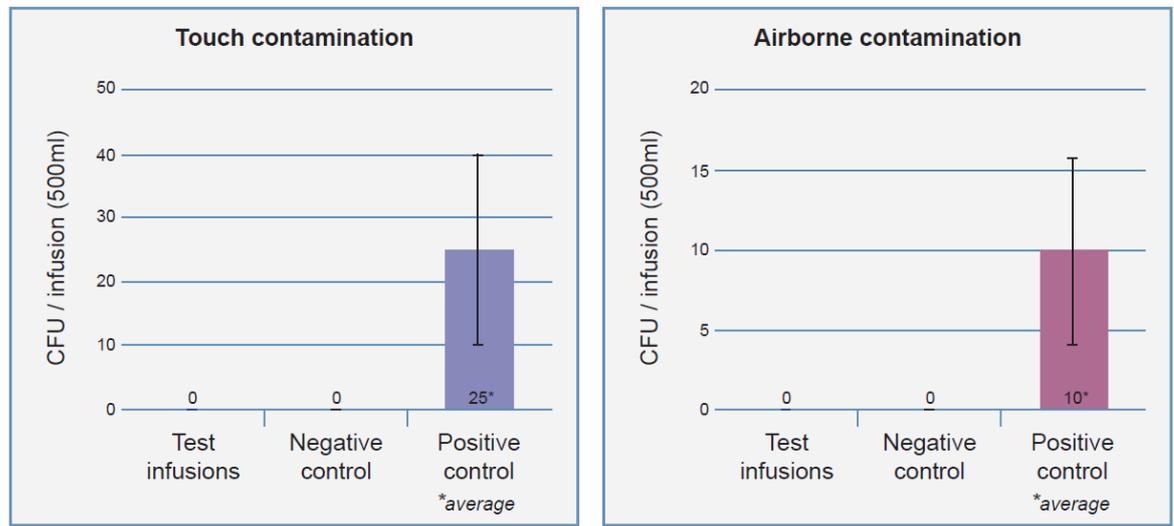
METHODS

For testing, a completely assembled infusion system with Ecoflac® plus IV container was used (Figure 1).

Two test scenarios were investigated:

- touch contamination of Ecoflac® plus IV container connection sites by pressing them onto a contaminated textile, using a defined artificial microbial contamination (gram-positive *Staphylococcus epidermidis*, gram-negative *Escherichia coli* and the yeast *Candida albicans*), followed by wipe disinfection

Figure 2: Number of microorganisms (colony forming units per 500 ml) isolated from the drained infusion solution after artificial contamination of the Ecoflac® plus IV container connection sites (touch/airborne; n=5), wipe disinfection and assembly of the infusion system.



REFERENCES

- [1] Allegranzi B, Bagheri Nejad S, Combescuré C et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *Lancet* 2011;377:228–41
- [2] Bagheri Nejad S, Allegranzi B, Syed SB, Ellis B, Pittet D. Health-care-associated infection in Africa: a systematic review. *Bull World Health Organ* 2011;89:757–65