Using a novel in vitro percutaneous catheter insertion model, ChronoFlex C with BioGUARD is proven to significantly inhibit bacterial attachment and biofilm formation as compared with a commonly used polyurethane catheter material" Pathak et al (2018).

Abstract:

INTRODUCTION: Despite sterile barrier precautions and vigorous skin antisepsis, percutaneous insertion of intravenous catheters has been shown to result in attachment to the catheter surface of bacteria residing in the deep structures of the skin. Such attachment poses the risk of biofilm formation and eventual catheter-related bloodstream infection (CRBSI). This study was undertaken to assess whether the non-coated surface treatment of a unique catheter material (ChronoFlex C® with BioGUARD™) could inhibit bacterial attachment and biofilm formation.

METHODS: A novel in vitro model and fluorescence microscopy were used to compare two intravascular catheter materials with respect to bacterial attachment and biofilm formation. The control material was a commonly used polyurethane. The study material was a unique copolymer, treated so as to remove surface additives, alter hydrophobicity and create surface micro-patterning. Outcomes were assessed using both a membrane potential indicator and a cell death reporter with appropriate fluorescent channels. Thus, bacterial cells

attached to the catheter surface (living and dead) were imaged without mechanical disruption.

RESULTS: Both bacterial attachment and biofilm formation are significantly inhibited by the study catheter material. In fact, over 5 times more bacteria were able to attach and grow on the control polyurethane material than on the study material (P=0.0020). Moreover, those few bacteria that were able to attach to the study material had a 1.5 times greater likelihood of dying.

CONCLUSION: Using a novel in vitro percutaneous catheter insertion model, ChronoFlex C with BioGUARD is proven to significantly inhibit bacterial attachment and biofilm formation as compared with a commonly used polyurethane catheter material.

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Reference:
Pathak, R., Bierman, S.F. and d'Arnaud, P. (2018) Inhibition of bacterial attachment and biofilm formation by a novel intravenous catheter material using an in vitro percutaneous catheter insertion model. Medical Devices. December 19th. eCollection 2018.

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