

# O3

## EXPLORING THE IMPACT OF INTERMITTENT CATHETERISATION ON URETHRAL MICROTRAUMA USING AN EX VIVO PORCINE MODEL

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### Introduction

Hydrophilic-coated intermittent catheters (ICs) offer enhanced user experience when compared to traditional uncoated ICs. Hydrophilic coatings absorb water, creating a hydrated surface that reduces friction between the IC and urethral tissue. However, the presence of polyvinylpyrrolidone (PVP) in the coating can lead to the IC surface becoming mucoadhesive (1). As a result, increased force and friction during IC withdrawal may result in complications including urethral microtrauma. To address these concerns, a coating-free hydrophilic technology incorporating integrated amphiphilic surfactants (IAS) has been developed (1). We compared the effects of IAS IC with hydrophilic PVP-coated IC on urethral microtrauma.

### Methods

An ex vivo porcine urethral model was designed using texture analyser (TA) apparatus, (Fig). Commercial ICs, one uncoated PVC and one hydrophilic PVP-coated IC, were compared with the IAS IC. Porcine urethra was placed into a centrifuge tube and 2.8% agar solution poured into the tube, surrounding the tissue. ICs were attached to upper grips of the TA and lowered vertically (5 mms-1) into the urethra to a depth of 50 mm. After 120 seconds (typical time to self-catheterise), the IC was elevated vertically (5 mms-1). Force required for IC withdrawal from the urethra was determined.

### Results

The force required to remove the uncoated PVC, hydrophilic PVP-coated and IAS ICs from the porcine urethra was  $0.39 \text{ N} \pm 0.01$ ,  $0.33 \text{ N} \pm 0.01$  and  $0.20 \text{ N} \pm 0.01$  respectively,  $n=3$ , (Fig). Preliminary findings suggest that IAS hydrophilic ICs may have the potential to cause less force and friction on withdrawal from the bladder, resulting in less damage to urethral tissue than uncoated and hydrophilic PVP-coated ICs. Furthermore, delamination of the hydrophilic PVP-coating was observed.

### Conclusion

The use of IAS ICs instead of uncoated and hydrophilic PVP-coated ICs may reduce friction and consequently, urethral microtrauma experienced during IC withdrawal from the bladder.

### **Reference:**

1. Pollard D, et al. *Biotribology* 2022; 32:100223.