

Same sized three-way indwelling urinary catheters from various manufacturers present different irrigation and drainage properties

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ABSTRACT

Background: The three-way indwelling urinary catheter (IUC) is used for continuous bladder irrigation and is considered the cornerstone for clinical treatment of patients with macroscopic hematuria. Although there seems to be a logical relationship between catheter size and efficacy of irrigation and drainage, we often observe relevant variations in these parameters between different brands of catheters available on the market. The aim of this study was to compare the mechanical properties of different models of latex and silicone three-way catheters in an in vitro setting that resembles clinical use.

Methods: Three different three-way catheters were evaluated: Gold Silicone-Coated Rusch® (Model A), 100% Silicone Rusch® (Model B) and X-Flow Coloplast® (Model C). Irrigation channel, drainage channel, and overall cross-sectional areas were all digitally measured. Irrigation and drainage channel flow rates were measured and correlated with their corresponding catheter cross-sectional area values.

Results: Different catheter models of the same caliber have different internal irrigation port diameters, internal drainage port diameters and internal cuff port diameters. The Model C IUC internal irrigation port diameter is significantly larger than models A and B. When flows were evaluated, we found that in the same model, the increase in caliber of the IUC was related to an increased drainage flow, but not to an increased irrigation flow.

Conclusion: Precise measurements of the internal architecture of the three-way catheter, rather than relying on the caliber itself, could assist surgeons in choosing the best product for each specific patient, while minimizing complications.

COLOPLAST KEY TAKEAWAYS

- The internal irrigation port diameter of the 20-Fr Coloplast X-Flow® is 48% larger than the Gold Silicone-Coated Rusch® and 66% larger than the 100% Silicone Rusch® IUC.
- The internal irrigation port diameter of the 22-Fr X-Flow® is 45% larger than the Gold Silicone-Coated Rusch® and 39% larger than the 100% Silicone Rusch® IUC.
- The internal irrigation port diameter of the 24-Fr X-Flow® is 47% larger than the Gold Silicone-Coated Rusch® and 64% larger than the 100% Silicone Rusch® IUC.
- The irrigation port external orifice of the X-Flow® is 2.5 times greater than the 100% Silicone Rusch® and four times greater than the Gold Silicone-Coated Rusch®.
- The irrigation port external orifice diameter of the 20-Fr X-Flow® is 11% larger than the 100% Silicone Rusch® and 52% larger than the Gold Silicone-Coated Rusch®.
- The irrigation port external orifice diameter of the 22-Fr X-Flow® IUC is similar to the 22-Fr 100% Silicone Rusch® IUC. Both are 41% larger than the Gold Silicone-Coated Rusch® IUC.
- The irrigation port external orifice diameter of the 24-Fr X-Flow® IUC is similar to the 100% Silicone Rusch® IUC. Both are 29% larger than the Gold Silicone-Coated Rusch® IUC.
- The 20-Fr X-Flow® IUC presented an irrigation flow that was 45% greater than the 24-Fr Gold Silicone-Coated Rusch® IUC and 56% greater than the 24-Fr 100% Silicone Rusch® IUC.
- In cases of gross hematuria, it is necessary to change the model and not the size of the catheter if the doctor requires a more abundant infusion flow.

Indications for Use: For short-term drainage of bladder urine, postoperative bladder irrigation-lavage, and for haemostasis of the prostatic fossa following prostate surgery.

Warnings:

- Using an iodine-based irrigation-lavage solution may damage some silicone catheters.
- Do not inflate the balloon beyond the maximum value indicated.
- Do not clamp the catheter. Use a plug if necessary.
- If the catheter needs to be secured, the adhesive must be applied to the connector.
- To lubricate catheters without a coating, a water-based lubricant is recommended.
- Reuse of this single use product may create a potential risk to the user. Reprocessing, cleaning, disinfection and sterilization may compromise product characteristics which in turn create an additional risk of physical harm to or infection of the patient.

Adverse Events: Several adverse events have been described with the use of balloon catheters. Some are related to the patient's conditions, the others to the procedure or the device: bladder irritation symptoms, pain, urinary tract infection, encrustation and stone formation, urinary tract trauma.

See Instructions for Use for detailed information regarding warnings/precautions, adverse events prior to using this product. For further information, contact Coloplast Corp at 1-800-258-3476 and/or consult the company website at www.coloplast.com.

Caution: Federal law (USA) restricts this device to sale by or on the order of a physician.

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