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SUMMER 2021

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Keep It Clean



New ICORD research sheds light on the safest and most effective ways to clean catheters for reuse.

In a perfect world, people with SCI wouldn't have to pay for the privilege to pee—and government programs would provide single-use intermittent catheters as part of basic health coverage. Sadly, that's not the case, and with our current patchwork of coverage, peers are too often forced to find ways of reusing catheters (even single use catheters which are approved for just one catheterization) to keep their out-of-pocket costs in check.

The business case for comprehensive catheter coverage is obvious: reusing catheters significantly raises the risk of UTIs, and UTIs are tremendously expensive for our healthcare system (not to mention tremendously costly in so many ways for those who experience them). Here at SCI BC, we're working with several partners to change our current reality and convince policy makers that expanding catheter coverage and extending it to more people just makes good sense. But in the interim, it also

makes sense to pass along any information to peers that can help them clean and sterilize their catheters to the best extent possible.

Recently, at the annual ICORD research meeting (held online for the second straight year due to the pandemic), we were pleased to see a comprehensive poster presentation reviewing the effectiveness of various catheter cleaning strategies. The poster, titled *The microbiological and physical properties of intermittent catheters: A systematic review on the impact of re-use and various cleaning methods*, was researched and created by Mark Grasdal, a UBC medical student in Dr. Andrei Krassioukov's ICORD lab, with assistance from Dr. Matthias Walter and Krassioukov himself.

"Current safety concerns about cleaning and reuse of catheters include increased risk of urinary tract infection due to remaining bacterial colonization on the catheter, and evidence suggesting that structural damage of the catheter

itself from cleaning could put users at risk of contracting UTIs by their reuse due to an increased risk of urethral and bladder trauma," explains Grasdal. "Given this, we decided to undertake this review to determine if there was a catheter cleaning method reported that both eliminated bacterial colonization as well as preserved the physical structure of the catheter."

Grasdal began the project with an exhaustive search of the global scientific literature to identify credible studies of the effectiveness and safety of various approaches to cleaning and sterilizing intermittent catheters for reuse. In the end, any study that failed to assess bacteria levels or damage to the catheter after cleaning were excluded. And that left just 12 studies that were determined to be of high enough quality to include in the systematic review.

The cleaning/sterilizing methods analyzed in these

studies included heat-based sterilization, chemical cleaning solutions, mechanical scrubbing, photocatalytic sterilization (using light), and combined methods.

When the dust settled, it turned out that most of the methods studied just didn't cut it.

"Only two cleaning methods—less than ten percent of published proposed cleaning methods—eliminated all bacteria and did not cause damage to the catheter," says Grasdahl.

The first method involved soaking catheters in a 70% alcohol solution for five minutes. The other, dubbed the "Milton method", used a combination approach consisting of a detergent wash followed by soaking in Milton sterilizing fluid—a solution containing sodium hypochlorite and sodium chloride that's produced by Procter & Gamble and mainly used in a diluted form to sterilize baby bottles.

Both methods left virtually no bacteria on the clean catheters, and neither did any physical damage to the catheters.

In contrast, heat-based sterilization and mechanical abrasion methods were either ineffective or damaged the catheters analyzed. In fact, all other cleaning methods were either non-bactericidal or caused gross visual or microscopic damage to the catheters, making them unsafe for reuse.

The take-home message for readers is that, if you have to reuse for financial or other reasons, then it seems logical to employ either of the two methods that Grasdahl and his collaborators found to be effective. However, Krassioukov offers some cautionary advice.

"Although our review did identify two potentially promising methods of cleaning catheters for re-use, we still do not have any data confirming that the re-use of catheters with these methods actually do not result in UTI," he says. "This question has to be answered before anyone can make a final conclusion that these methods of cleaning are safe and we should change policies."

In other words, more research is desperately needed before any person or clinical guidelines can state with confidence that reusing single-use catheters is risk-free. The fact that there is such a void of quality research into this area was a real eye-opener for Grasdahl.

"Initially, I was surprised by the lack of research done on this topic, given the large portion of individuals who reportedly reuse intermittent catheters," he says.

"We hope that the results of this manuscript spark further investigation into this topic." ■

*UBC medical student
Mark Grasdahl*



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