Technoleg Iechyd Cymru
Health Technology Wales

Topic Exploration Report [1]

Biofilm-resistant polymer-coated urinary catheters

What is a Topic Exploration Report?

Topic Exploration Reports are not health technology assessments. These reports provide a high-level briefing on new topics submitted to Health Technology Wales and are not based on exhaustive or systematic literature searches. Instead, they rely on a focussed scan of key resources.

What evidence is used in a Topic Exploration Report?

Priority is given to summarising the most relevant or useful evidence, rather than covering all possible evidence. Information reported is typically based on abstracts and study authors' own conclusions, rather than detailed scrutiny of full texts.

What are the aims of a Topic Exploration Report?

Topic Exploration Reports offer an overview of the available evidence on a topic and aim to highlight any uncertainties or gaps in the evidence. These reports outline the quantity and type of evidence found, but no critical appraisal or formal evidence synthesis is conducted.

How should a Topic Exploration Report be used?

Topic Exploration Reports can be used to indicate what evidence may be available for a topic, and do not provide definitive guidance on how a technology should be used. The evidence presented within the reports should be interpreted with caution.

[1] Cyfieithu dogfennau HTW wedi'u cyhoeddi o'r Saesneg i'r Gymraeg
Translation of published technical HTW documents from English into Welsh

Topic exploration report number	TER684
Topic	Biofilm-resistant polymer-coated urinary catheters
Summary of findings	Urinary tract infection (UTI) may occur when a person is fitted with an in-dwelling urinary catheter. This is often due to bacterial colonisation and deposition of a biofilm on the catheter surface. Surface coatings for urinary catheters have been developed that are resistant to biofilm formation, such as Camstent's Bacteriaphobic polymer coating, which could then reduce bacterial colonisation and the numbers of UTI, without contributing to antimicrobial resistance. One randomised controlled trial comparing Camstent coated urinary catheters to standard, uncoated catheters was identified. There were lower colonisation rates with Camstent catheters compared with standard catheters up to 14 days in those who were newly catheterised; however, the difference between groups was not statistically significant at 21 and 28 days. The mean number of days infected was statistically significantly shorter in the Camstent group (1.6 days shorter). In long-term catheter users, none developed symptomatic UTIs in the Camstent group compared with 20% in the standard catheter group. For the whole per protocol population, the median time to develop symptoms was 6.5 days longer in the Camstent group and antibiotic use was much lower in this group (4% vs. 21%). Areas of uncertainty include only identifying one relevant study reporting clinical outcomes, a lack of economic evidence, a lack of comparison to other types of antimicrobial-coated catheters, and it being unclear whether other biofilm-resistant polymer coatings besides Camstent are available.

Introduction and aims

Catheter-associated urinary tract infection (UTI) is a symptomatic infection of the bladder or kidneys in a person who is catheterised or has had a urinary catheter in place within the previous 48 hours. Bacteria can colonise the surface of urinary catheters and begin laying down a biofilm which can protect bacteria from the host immune system and impede antimicrobial penetration. This can then lead to UTIs becoming persistent. Antibiotics may need to be prescribed, adding to potential antimicrobial resistance issues.

Catheters with modified surfaces aimed at reducing bacterial colonisation, and subsequent UTI, have been developed. These include coating with silver ions, antibiotics, or noble metal alloys. However, these may not prevent or disrupt biofilm formation. Camstent has developed urinary catheters coated in its 'Bacteriaphobic' coating technology. This polymer coating inhibits the formation of a biofilm, creating an environment that 'repels' bacteria without killing them, and not contributing to antimicrobial resistance. It also reduces friction, aiding insertion and removal. This can then reduce the number of catheter-associated UTIs and the need for antibiotics. Camstent's biofilm-resistant polymer-coated urinary catheters are both CE- and UKCA-marked as Class IIa medical devices.

Health Technology Wales researchers searched for evidence on the clinical and cost effectiveness of biofilm-resistant polymer-coated urinary catheters for the prevention of urinary tract infections.

Evidence overview

One randomised controlled trial (RCT) comparing Camstent coated catheters to standard, uncoated catheters, conducted in the UK, was identified (Rochester et al. 2026). The intention-to-treat (ITT) population included 200 participants and the per protocol (PP) population included 188 participants. The PP population was split into primary and secondary cohorts with 107 and 81 participants, respectively. The primary cohort included newly catheterised subjects whose bladders were not infected, and the secondary cohort consisted of 'long-term catheter users who had bladder infections without clear clinical signs (asymptomatic), as well as cases presenting symptoms such as fever requiring antibiotic treatment (symptomatic)'.

Primary cohort

Colonisation-free rates were statistically significantly higher in the Camstent group than in the standard catheter group at days 7 and 14 ($p = 0.016$). This difference persisted at days 21 and 28, with consistently lower infection rates in the Camstent group; however, the difference was not statistically significant at these timepoints ($p > 0.05$). The mean number of days infected during the first 14 days was lower in the Camstent group than the standard catheter group (3 versus 4.6 days, $p = 0.0117$).

Secondary cohort

The median time to the development of symptoms, defined as a UTI requiring antibiotics, in the standard catheter group was nine days. No participants in the Camstent group developed symptomatic UTIs, compared with 20% of participants in the standard catheter group ($p = 0.0054$).

Per protocol population

Symptomatic infections occurred in 4% of the Camstent group and 20% of the standard catheter group ($p = 0.0007$), with a longer median time to symptoms in the Camstent group (13.5 vs. 7 days). Antibiotic use was significantly lower in the Camstent group compared with the standard catheter group (4% vs. 21%).

Evidence overview

During catheter insertion, more patients experienced some level of discomfort in the Camstent group (9 out of 22, 40.9%) than the standard catheter group (8 out of 30, 26.7%). The proportions of patients experiencing some level of discomfort during catheter removal was similar between the two groups (5 out of 22, 22.7% versus 8 out of 30, 26.7%, respectively).

Treatment emergent adverse events occurred in 32 and 36 participants in the Camstent and standard catheter groups, respectively. Two serious adverse events occurred in both groups. However, no details of the types of adverse events were reported. Catheter blockage occurred more frequently in the Camstent group (13.1% versus 1%) but the statistical significance was not reported.

Areas of uncertainty

- Only one study reporting clinical outcomes was identified, which was sponsored by the manufacturer of the device.
- No studies comparing biofilm-resistant polymer-coated catheters to other treated or coated catheters were identified.
- It is uncertain whether other biofilm-resistant polymer coatings for urinary catheters are available.
- No economic evidence was identified, though the topic proposer has indicated economic assessment is currently underway.

Literature search results

Individual studies
Rochester M, Rennie C, Hayes C, et al. (2026). A prospective multicenter randomized study to assess the impact of a novel catheter coating on clinical bacteriuria. Antibiotics (Basel). 15(4). doi: https://doi.org/10.3390/antibiotics15040369

Date of search	21 July 2026
Concepts used	Camstent, polymer coating, catheter, bacteriaphobic, biofilm-resistant acrylate polymers, Bactigon, Catheter-associated urinary tract infection, CAUTI

Proposed research question and evidence selection criteria (if selected)

Proposed Research question	**What is the clinical and cost effectiveness of biofilm-resistant polymer-coated urinary catheters for the prevention of urinary tract infections?**

	Inclusion criteria	Exclusion criteria
Population	People requiring a urinary catheter	
Intervention	Biofilm-resistant polymer-coated urinary catheters	
Comparison/ Comparators	Standard, uncoated catheters Antimicrobial-coated/eluting catheters Silver-coated/eluting catheters	
Outcome measures	Infection rates Antibiotic use Number of days infected Time to infection Time to symptoms Patient acceptability/comfort Safety and adverse events Health related QoL Resource use Economic outcomes	

Proposed speciality	**Genitourinary system**