

2016



## **Oppsummert forskning om forebygging av kateterrelatert urinveisinfeksjon**

Systematisk oversikt

**Systematic reviews on preventing catheter-associated urinary tract infection:  
A systematic review**  
This is an excerpt from the full technical report,  
which is written in Norwegian.  
The excerpt provides the report's main messages in English.

**This is an excerpt from the full technical report,  
which is written in Norwegian.  
The excerpt provides the report's main messages in English.**

**Published by:** National Institute of Public Health, Division of Health Services

**Title** Systematic reviews on preventing catheter-associated urinary tract infection

**Norwegian title** Oppsummert forskning om forebygging av kateterrelatert urinveisinfeksjon

**Responsible** Camilla Stoltenberg, *Director*

**Authors** Holte, Hilde H.  
Underland, Vigdis  
Hafstad, Elisabet

  

**ISBN** 978-82-8082-722-7

**Report #** 2016-19 [excerpt]

**Type of publication** Systematic review

**No. of pages** 46 (63 including appendices)

**Client** The Western Norway Regional Health Authority

**Subject heading (MeSH)** Catheter-Related Infections; Urinary Catheters; Urinary Tract Infections

**Citation** Holte HH, Underland V, Hafstad E. Systematic reviews on preventing catheter-associated urinary tract infection, Folkehelseinstituttet. Research overview Mars 2016. ISBN: 978-82-8082-722-7

# Key messages (English)

The number of patients in hospitals and rehabilitation institutions at any time is large, and a considerable number of them need to use a urinary catheter. Catheter-associated urinary tract infection may affect a large number of persons. The survey of prevalence of May 2015 from the Norwegian Institute of Public Health reported that 1.2 percent of patients in hospitals suffered from a urinary tract infection. We have systematically reviewed research on effect of interventions to prevent catheter-associated urinary tract infection.

We identified seven systematic reviews of high methodological quality published in the Cochrane Database of Systematic Reviews after 2010, i.e. after the Patient Safety Campaign started. The reviews intended to review the effect of 41 different interventions. Only 15 interventions were studied, and five of these studies included less than 25 participants. When the intervention is only evaluated in one study, and with few participants, we have little confidence in the effect estimate. Most studies were published between 1979 and 1997 only four studies were published after 2010. One of these studies found that among patients who had antibiotic impregnated catheters, there was a small reduction in the incidence of catheter-associated urinary tract infection. Whether this effect is clinically significant is unclear. We do not have sufficient documentation for other interventions intended to prevent catheter-related urinary tract infection.

Several of the studies evaluated the effect of antibiotics, and even though antibiotics seem to prevent infections, the studies included very few participants or had methodological weaknesses that contribute to our very low confidence in the effect estimates. The Norwegian national guidelines for prevention of catheter-associated urinary tract infection recommends that catheters impregnated with antibiotics should not be the first choice in Norwegian hospitals. Our report did not find evaluations of long term effects of antiseptic or antibiotic agents for preventing catheter-associated urinary tract infections. Antibiotic resistant bacteria is a problem, in Norway as well as internationally. This is important to keep in mind when applying these results.

There is a need for research about prevention of catheter-related urinary tract infection.

**Title:**

Systematic reviews on preventing catheter-associated urinary tract infection

**Type of publication:  
Systematic review**

A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies

**Doesn't answer everything:**

- Excludes studies that fall outside of the inclusion criteria
- No health economic evaluation
- No recommendations

**Publisher:**

Norwegian Knowledge Centre for the Health Services

**Updated:**

Last search for studies: July 2015.

**Peer review:**

Mette Fagernes, Folkehelseinstituttet. A professor in urology, wants to remain anonymous

---

# Executive summary (English)

---

## Background

---

Indications for use of indwelling catheters are acute, chronic or temporary urine retention, prolonged surgery, need for accurate measurements of urinary output, continuous washout of bladder, bladder outlet obstruction or that the patient will not or cannot use intermittent catheter.

Examples of inappropriate use of indwelling catheters include use as substitute for nursing care of patients with incontinence, as a means to obtain urine for diagnostic tests when patients can voluntarily void, for prolonged postoperative use of catheters without appropriate indications.

Indwelling catheter is the main cause of healthcare-associated urinary infection. The longer the indwelling catheter is in use, the larger the risk of infection.

---

## Method

---

We searched for systematic reviews about prevention of catheter-associated urinary tract infections. We included systematic reviews that were published in 2010 or later in the Cochrane Database of Systematic Reviews or were covered by Agency of Healthcare Research and Quality's (AHRQ) report "Making Health Care Safer II".

We evaluated the systematic reviews identified in the Cochrane Database of Systematic Reviews to be of high quality by use of checklist to evaluate the quality of systematic reviews, and that they had searches for literature newer than the AHRQ report.

We have included these reviews and have done no further searches, neither for systematic reviews or primary studies. We have extracted data about relevant interventions for preventing infections, and graded our confidence in the results using GRADE.

---

## Results

---

We identified seven systematic reviews that Cochrane Database of Systematic Reviews published. Altogether, the authors of these seven reviews intended to evaluate 41 different interventions for preventing catheter-associated urinary tract infection. For 26 of these interventions the authors could not identify any effect studies. Most of the included studies that evaluated the remaining 15 interventions were published between 1979-1997. These studies cannot contribute to the discussion on the renewed development of the Patient Safety Program. Only four studies were published after 2010.

Interventions comprised use of various types of catheters, antiseptic or antibiotic impregnated catheters and different washout policies. Several interventions were evaluated in only one study, and many of the identified studies had very few participants, both contribute to the low confidence in the published effect estimates, and that we could not conduct meta-analysis. The only study presented in the seven reviews where we have confidence in the effect estimate was also presented on the home pages of the Norwegian Knowledge Centre for the Health Services in December 2014. The results were:

- Type of urinary catheter, silver alloy vs standard catheter, probably have similar effect for prevention of catheter-related urinary tract infection. Documentation of moderate quality.
- The patients that had antibiotic impregnated (nitrofurazone) catheters had a small reduction in the incidence of catheter-related urinary tract infection. Whether this effect is clinically significant is unclear. Documentation is of low to moderate quality.

We do not have sufficient documentation for other interventions for preventing catheter-related urinary tract infection.

---

## Discussion

---

National guidelines recommends that antibiotic impregnated catheters should not be routinely used. The six interventions about antibiotic impregnated catheters and antibiotic prophylaxis are therefore probably not relevant for the Norwegian setting.

The heterogeneity in the reviewed research is significant. The group of patients with indwelling catheters varies with regard to diagnoses, bladder function and cognitive abilities. In addition, the variation in definitions of catheter-related urinary tract infection makes it very difficult to interpret results from the research.

Even though antibiotics prevent infections, the studies included very few participants or had methodological weaknesses that contributes to the documentation being of very low quality, i.e. our confidence in the published effect estimates are very low. We cannot conclude if an effect estimate is the true effect estimate.

This report did not find evaluations of long term effects of antiseptic or antibiotic agents for preventing catheter-associated urinary tract infections. The longest duration of follow-up was 18 months. Antibiotic resistant bacteria is a problem, in Norway as well as internationally. This is important to keep in mind when applying these results.

The seven reviews included intended to evaluate 41 different interventions that might reduce catheter-associated urinary tract infection. Only 15 interventions were evaluated in effect studies and five of these included less than 25 patients. The main part of the studies included in the reviews were performed between 1979 and 1997, and we think that these studies will not contribute to a discussion about development of the Patient Safety Program. There is a need for research on preventing catheter-related urinary tract infections.

---

## **Conclusion**

---

We identified seven systematic reviews of high quality that intended to review the effect of 41 different interventions. The main portion of the studies included in the reviews were conducted between 1979 and 1997 and many had methodological weaknesses. We have generally low confidence in the published effect estimates. Of the included studies there is only one in which we have confidence in the effect estimate. In the study published 2012, patients with antibiotic impregnated catheters had a small reduction in incidence of catheter-associated urinary tract infection. Whether this effect is clinically significant is unclear. Apart from this study, we have not identified effect studies in the included systematic reviews for which we have confidence in the effect estimate.