



TITLE: Urine Testing in Long-Term Care: Clinical and Cost Effectiveness

DATE: 22 December 2014

RESEARCH QUESTIONS

1. What is the clinical effectiveness of urine culture and sensitivity analysis, urine dipstick testing, or urinalysis for urine testing in asymptomatic residents in long-term care?
2. What is the cost-effectiveness of urine culture and sensitivity analysis, urine dipstick testing, or urinalysis for urine testing in asymptomatic residents in long-term care?

KEY FINDINGS

Three non-randomized studies were identified regarding the clinical effectiveness of urine culture and sensitivity analysis, urine dipstick testing, or urinalysis for urine testing in asymptomatic residents in long-term care. No relevant economic evaluations were identified.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014 December, Issue 12), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, and economic studies. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and December 8, 2014. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

Disclaimer: The Rapid Response Service is an information service for those involved in planning and providing health care in Canada. Rapid responses are based on a limited literature search and are not comprehensive, systematic reviews. The intent is to provide a list of sources of the best evidence on the topic that CADTH could identify using all reasonable efforts within the time allowed. Rapid responses should be considered along with other types of information and health care considerations. The information included in this response is not intended to replace professional medical advice, nor should it be construed as a recommendation for or against the use of a particular health technology. Readers are also cautioned that a lack of good quality evidence does not necessarily mean a lack of effectiveness particularly in the case of new and emerging health technologies, for which little information can be found, but which may in future prove to be effective. While CADTH has taken care in the preparation of the report to ensure that its contents are accurate, complete and up to date, CADTH does not make any guarantee to that effect. CADTH is not liable for any loss or damages resulting from use of the information in the report.

Copyright: This report contains CADTH copyright material and may contain material in which a third party owns copyright. **This report may be used for the purposes of research or private study only.** It may not be copied, posted on a web site, redistributed by email or stored on an electronic system without the prior written permission of CADTH or applicable copyright owner.

Links: This report may contain links to other information available on the websites of third parties on the Internet. CADTH does not have control over the content of such sites. Use of third party sites is governed by the owners' own terms and conditions.

SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria	
Population	Asymptomatic long-term care residents who are: <ul style="list-style-type: none"> • incontinent with or without catheters • continent
Intervention	Urine testing (urine culture and sensitivity analysis, dipstick, urinalysis)
Comparator	Standard of care, tests compared with each other, none
Outcomes	Q1: Benefits or harms associated with frequency of testing; change in treatment of patients based on test results; prognostic value of test results Q2: Cost-effectiveness
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and economic evaluations.

Three non-randomized studies were identified regarding the clinical effectiveness of urine culture and sensitivity analysis, urine dipstick testing, or urinalysis for urine testing in asymptomatic residents in long-term care. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One non-randomized study¹ compared the validity of multi-reagent strips with standard urinalysis for the early detection of urinary tract infection (UTI) in long-term care (LTC) residents. Urine samples were tested for leukocyte esterase and nitrite. Dipstick tests that were positive for leukocyte esterase or nitrite were not specific indicators of a UTI and had high false negative rates. The authors concluded that dipstick tests alone were not suitable for screening residents for UTI. A second non-randomized study³ compared dipstick analysis for leukocyte esterase and nitrite with urine culture. The authors suggested using both dipsticks and determined that, when both dipstick tests were negative, the presence of pathogenic bacteria could be ruled out with a negative predictive value of 88%.

One non-randomized study² aimed to identify clinical features that could be used to identify UTI in non-catheterized LTC residents. Painful urination, change in urine character, and change in mental status were determined to be significantly associated with bacteriuria and pyuria.

No relevant economic analyses were identified.

REFERENCES SUMMARIZED

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

1. Arinzon Z, Peisakh A, Shuval I, Shabat S, Berner YN. Detection of urinary tract infection (UTI) in long-term care setting: Is the multireagent strip an adequate diagnostic tool? Arch Gerontol Geriatr. 2009 Mar;48(2):227-31.
[PubMed: PM18314207](#)
2. Juthani-Mehta M, Quagliarello V, Perrelli E, Towle V, Van Ness PH, Tinetti M. Clinical features to identify urinary tract infection in nursing home residents: a cohort study. J Am Geriatr Soc [Internet]. 2009 Jun [cited 2014 Dec 19];57(6):963-70. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2692075>
[PubMed: PM19490243](#)
3. Sundvall PD, Gunnarsson RK. Evaluation of dipstick analysis among elderly residents to detect bacteriuria: a cross-sectional study in 32 nursing homes. BMC Geriatr [Internet]. 2009 [cited 2014 Dec 19];9:32. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2724370>
[PubMed: PM19635163](#)

Economic Evaluations

No literature identified.

PREPARED BY:

Canadian Agency for Drugs and Technologies in Health

Tel: 1-866-898-8439

www.cadth.ca

APPENDIX – FURTHER INFORMATION:

Non-Randomized Studies – Alternate Population and Setting

4. Silver SA, Baillie L, Simor AE. Positive urine cultures: a major cause of inappropriate antimicrobial use in hospitals? *Can J Infect Dis Med Microbiol* [Internet]. 2009 [cited 2014 Dec 19];20(4):107-11. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2807252>
[PubMed: PM21119801](#)

Multiple Study Designs

5. Dipsticks and diagnostic algorithms in urinary tract infection: development and validation, randomised trial, economic analysis, observational cohort, and qualitative study. *Health Technol Assess* [Internet]. 2009 [cited 2014 Dec 19];13(9). Available from:
<http://www.journalslibrary.nihr.ac.uk/hta/volume-13/issue-19>

Review Articles

6. Nace DA, Drinka PJ, Crnich CJ. Clinical uncertainties in the approach to long term care residents with possible urinary tract infection. *J Am Med Dir Assoc*. 2014 Feb;15(2):133-9.
[PubMed: PM24461240](#)

Additional References

7. Juthani-Mehta,M. Chapter 32: Urinary tract infections in elderly persons [Internet]. In: *Geriatric nephrology curriculum*. Washington(DC): American Society of Nephrology; 2009. [cited 2014 Dec 19]. Available from:
<https://www.asn-online.org/education/distancelearning/curricula/geriatrics/Chapter32.pdf>