

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Urinary Dipstick Testing for Bladder Cancer Screening: Diagnostic Accuracy, Clinical Effectiveness and Guidelines

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Research Questions

1. What is the diagnostic accuracy of urinary dipstick testing for bladder cancer screening in asymptomatic adult patients with microscopic hematuria?
2. What is the clinical effectiveness of urinary dipstick testing for bladder cancer screening in asymptomatic adult patients?
3. What are the evidence-based guidelines regarding the use of urinary dipstick testing for bladder cancer screening?

Key Findings

Two non-randomized studies were identified regarding the diagnostic accuracy of urinary dipstick testing for bladder cancer screening. In addition, one evidence-based guideline was identified regarding the the use of urinary dipstick testing for bladder cancer screening.

Methods

A limited literature search was conducted on key resources including Ovid Medline, the Cochrane Library, 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, and guidelines. No filters were used to identify potentially relevant randomized controlled trials or non-randomized 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 March 21, 2019. Internet links were provided, where available.

Selection Criteria

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

Table 1: Selection Criteria

Population	Asymptomatic adult patients with microscopic hematuria
Intervention	Urinary dipstick testing
Comparator	Q1,Q2: Microscopic testing or urine cytology for bladder cancer screening (e.g., cystoscopy, biopsy) Q1,Q2: No comparator (e.g. no screening technique) Q3: No comparator required
Outcomes	Sensitivity, specificity, harms, benefits, morbidity, mortality, disease progression
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines

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 evidence-based guidelines.

Two non-randomized studies were identified regarding the diagnostic accuracy of urinary dipstick testing for bladder cancer screening. In addition, one evidence-based guideline was identified regarding the use of urinary dipstick testing for bladder cancer screening. No relevant health technology assessments, systematic reviews, meta-analyses or randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Two non-randomized studies^{1,2} were identified regarding the diagnostic accuracy of urinary dipstick testing for bladder cancer screening. The authors of the first study compared bladder cancer screening methods of dipstick testing, and a sequential protocol that utilized home hematuria testing followed by molecular markers.¹ The authors found that the sequential protocol reduced the number of cystoscopy recommendations, and also improved the accuracy in identifying urological cancers, which was otherwise missed with dipstick testing alone.¹ The authors of the second study aimed to evaluate the positive predictive value (PPV) of using microhematuria and gross hematuria as indicators for bladder cancer screening and their influence on tumour tests.² Dipstick testing was used to determine hematuria, followed by blood cell count in the sediment. Gross hematuria was present in four out of nine high grade tumours and had a PPV of 11.4%, while microhematuria had a low PPV of 1.2% and its presence in this study was not associated with bladder cancer.² The authors concluded that although microhematuria had a low PPV, there was a strong influence of hematuria and leukocytes on the protein-based tumour test NMP22.²

Evidence-based guidelines from the European Association of Urology evaluated bladder cancer screening in high risk populations.³ Given the low incidence of bladder cancer in the general population, they do not recommend routine application of screening using hematuria dipstick, NMP22, or UruoVysion, taking into consideration feasibility and cost-effectiveness.³

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. Bangma CH, Loeb S, Busstra M, et al. Outcomes of a bladder cancer screening program using home hematuria testing and molecular markers. *Eur Urol*. 2013 Jul;64(1):41-47.
[PubMed: PM23478169](#)
2. Pesch B, Nasterlack M, Eberle F, et al. The role of haematuria in bladder cancer screening among men with former occupational exposure to aromatic amines. *BJU Int*. 2011 Aug;108(4):546-552.
[PubMed: PM21223477](#)

Guidelines and Recommendations

3. Babjuk M, Böhle A, Burger M, et al. Guidelines on non-muscle-invasive bladder cancer (Ta, T1 and CIS). Arnhem (NL): European Association of Urology; 2015:
<https://uroweb.org/wp-content/uploads/EAU-Guidelines-Non-muscle-invasive-Bladder-Cancer-2015-v1.pdf>. Accessed 2019 Apr 1.
See 5.7.1 Screening of the population at risk of BC, page 10.

Appendix — Further Information

Non-randomized Studies – Adherence to Screening Guidelines

4. Shinagare AB, Silverman SG, Gershanik EF, Chang SL, Khorasani R. Evaluating hematuria: impact of guideline adherence on urologic cancer diagnosis. *Am J Med.* 2014 Jul;127(7):625-632.
[PubMed: PM24565590](#)
5. Rao PK, Gao T, Pohl M, Jones JS. Dipstick pseudohematuria: unnecessary consultation and evaluation. *J Urol.* 2010 Feb;183(2):560-564.
[PubMed: PM20018314](#)

Guidelines and Recommendations

Bladder Screening Not Specified in Abstract

6. Davis R, Jones JS, Barocas DA, et al. Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline. *J Urol.* 2012 Dec;188(6 Suppl):2473-2481.
[PubMed: PM23098784](#)

Methods Unspecified

7. Victoria J. Sharp, Kerri T. Barnes, Bradley A. Erickson. Assessment of asymptomatic microscopic hematuria in adults. *Am Fam Physician.* 2013 Dec 1;88(11):747-754.
<https://www.aafp.org/afp/2013/1201/p747.html>. Accessed 2019 Apr 1.

Review Articles

8. Nielsen M, Qaseem A, High Value Care Task Force of the American College of Physicians. Hematuria as a marker of occult urinary tract cancer: advice for high-value care from the American College of Physicians. *Ann Intern Med.* 2016 Apr 05;164(7):488-497.
[PubMed: PM26810935](#)
9. Schmitz-Drager BJ, Kuckuck EC, Zuiverloon TC, et al. Microhematuria assessment an IBCN consensus-based upon a critical review of current guidelines. *Urol Oncol.* 2016 10;34(10):437-451.
[PubMed: PM27641313](#)
10. Chou R, Dana T. Screening adults for bladder cancer: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2010 Oct 05;153(7):461-468.
[PubMed: PM20921545](#)