

INTEGRATING THE LODESTAR DX RAPID URINE ANALYSER FOR REAL-TIME UROPATHOGEN IDENTIFICATION AND ANTIBIOTIC STEWARDSHIP IN UROLOGY OUTPATIENTS

Authors

Saif-Ur-Rehman Kazi; Clemence Musabyimana;
Miggy Alvarez; Bob Yang



Topic: Technology & Artificial Intelligence

Introduction

- Urinary tract infections (UTIs) are the commonest bacterial infection worldwide.
- Timely and accurate diagnosis is important for effective treatment and antimicrobial stewardship.
- Standard urine microscopy, culture and sensitivity (MC&S) can take several days and may miss clinically relevant infection.
- Urine dipstick testing alone can also miss organisms, particularly non-nitrite-producing pathogens.
- We evaluated a rapid, point-of-care (POC) UTI diagnostic machine in a real outpatient urology setting.

Objectives

- To assess the impact of POC UTI diagnostics on clinical decision making.
- To compare POC UTI diagnostics with standard urine MC&S and dipstick testing.

Methodology



- 53 urine samples were collected from patients in an acute urology clinic. Average Age 53.4 years.
 - 30 patients were tested due to acute urinary symptoms.
 - 20 patients were tested as part of pre-procedure screening
 - 3 patients were tested to ensure uropathogen eradication post-treatment.
- These samples were run in the Lodestar Dx system and tested with dipstick.
- Samples with a positive result on urinalysis or on the Lodestar Dx were sent for MC&S.

- The Lodestar Dx system is a rapid, point-of-care urine analyser.
- Using Loop-Mediated Isothermal Amplification (LAMP) technology, it is pre-programmed to detect 7 common uropathogens:
 - *Escherichia coli*, *Enterococcus* spp., *Staphylococcus saprophyticus*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*
- Results are reported in ~35 minutes.
- Clinical notes were reviewed to assess the effect of the POC test result on treatment decisions.

Error
n=2

Results

Positive Test n=19

- Changed treatment pathway in n=17 cases, of which 100% were given antibiotic treatment.
- MC&S was positive on 5 samples.
- Negative urine dipstick samples (n=12) contained: *E. coli* (n=5), *Enterococcus* spp. (n=5), *Proteus* (n=5), *Pseudomonas* (n=3). The latter three are commonly missed, non-nitrite producing organisms.

Negative Test n=32

- Changed treatment pathway in n=21 cases, of which 90% of cases avoided antibiotics.
- Concordance rate: 91%.
 - MC&S was positive on 3 samples for: *Raoultella ornithinolytica*, *Citrobacter*, and a mixed growth.
- Positive urine dipstick samples n=4

Take Home Messages

- POC UTI diagnostics enabled same-visit decision-making in the outpatient clinic by returning results within 35 minutes.
- POC UTI testing changed clinical management in 75% of cases and helped avoid unnecessary antibiotics in 37%.
- POC UTI testing can be a useful alternative to conventional diagnostics, supporting targeted antimicrobial treatment and antimicrobial stewardship.