

Developing rapid *E. coli* clonal diagnostics for Group Health to improve appropriate UTI treatment

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How we got together & what we're doing

- There has been rapid worldwide emergence of resistant *E. coli*.
- This team has been working with our UW collaborators for the past 3-4 years on emerging clonal-level diagnostic technology for *E. coli*.
- Our aims were to:
 1. Generalize the research diagnostic methods developed in the UW research lab to the GH community lab setting, using standard primers and equipment
 2. Assess the prevalence of two highly-resistant *E. coli* clones (ST131 and ST69) in >600 GH lab samples
 3. Compare usual care (empirical) treatment to potential prescribing based on knowledge of clonal level diagnostics.

What we're finding out

- The project has demonstrated the feasibility of implementing the new clonal diagnostic test in a community lab accurately, economically and rapidly (test currently takes ~40 min.; sensitivity and specificity >95% ; cost ~\$3).
- Clonal testing of 619 GH lab samples found that the prevalence of the two highly selected clones (ST131 and ST69) was **15%**. Although comprising only 15% of the overall group, the two clones comprised **33%** of all of the trimethoprim/sulfamethoxazole resistant samples and **71%** of the fluoroquinolone resistant samples.
- 8% of the 619 patients were prescribed an antibiotic for which the bacteria was resistant (a 'drug-bug mismatch'). Overall, the 2 clones comprised 40% of the 'mismatch' patients.

Value to Group Health & beyond

- Clonal *E. coli* testing can greatly reduce presumptive therapy by providing clonal-level information within an hour.
- Early effective treatment can reduce resistance and prevent serious complications such as recurrent UTI, kidney infection, and sepsis.
- It can improve GH's antibiotic stewardship and reduce utilization and costs of these infections.

Challenges ahead

- Moving this technology into daily clinical care, where clonal results can impact the 'drug-bug mismatch' that occurs with empirical therapy.
- Formal testing, via a randomized trial, of the performance of the prototype rapid clonal testing package.