



MICROBIOLOGY NEWSLETTER

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**THERE ARE NO NORMAL VALUES IN MICROBIOLOGY!
AN IMPROPERLY COLLECTED SPECIMEN MEANS UNINTERPRETABLE RESULTS!**

COMMUNITY-ONSET URINARY TRACT INFECTIONS IN THE CALGARY HEALTH REGION

Urinary tract infections (UTI) are one of the most common types of infection requiring physician assessment and prescription of anti-microbial therapy. Up to 40-50% of adult women will have at least one episode of UTI. Elderly patients are also more susceptible to getting a UTI. Several studies have also identified sexual activity, diabetes, chronic catheterization, and congenital or acquired urinary tract abnormalities amongst the major host risk factors for UTI.

A single type of bacterium will cause 95% of UTI episodes in ambulatory patients with uncomplicated infections, and *E. coli* is by far the most frequent infecting organism. Numerous reports worldwide have recently indicated that rates of resistance in *E. coli* and other common uropathogens are increasing rapidly to the traditional first line antibiotic agents used to treat UTI such as ampicillin, cephalixin and trimethoprim-sulfamethoxazole (SXT).

Calgary Laboratory Services conducted laboratory-based surveillance from 2004 – 2005 in order to define the incidence, demographic risk factors, and microbiology of community onset UTI occurring among all residents of the Calgary Health Region. The results are summarized in this newsletter.

Epidemiology

During the two years of the study, a total of 40,618 episodes of UTI occurred among 30,851 residents for an overall annual incidence of 17.5 per 1,000 population per year. The incidence was higher in 2005 (18.5 per 1,000) than in 2004 (16.5 per 1,000). Fourteen percent (5,556) of patients had more than one UTI during the two years of surveillance and 1,976 (4.9%) patients had three, 918 (2.3%) had four, 506 (1.3%) had five, and 811 (2%) had six or more.

Most of the cultures were submitted from ambulatory patients (30,006; 73.9%) and 7,146 (17.6%) were sent from hospital patients either from the Emergency department or within the first two days of admission, and 3,466 (8.5%) from nursing home residents. Overall, females were at significantly increased risk as compared to males (30.0 vs. 5.0 per 1,000, RR 5.98; 95% CI, 5.81-6.15; $p < 0.0001$) and this was observed across all age groups with the exception of those aged < 1 year. In males, after the first year of life, community onset UTI was rare until late middle age when a significant increase in incidence occurred with each subsequent decade of life. In comparison, females demonstrated a moderate decrease in incidence through childhood and adolescence, a first peak in early adulthood, then a gradual decrease in occurrence until late middle age when a substantial increase occurred in association with advancing age.

Microbiology

A total of 42,785 isolates were obtained from the 40,618 episodes of community onset UTI; polymicrobial infections occurred in 2,140 patients. *Escherichia coli* was by far the most common species isolated overall.

Ninety-two percent (553/603) of UTIs in infants (<1 years of age) were caused by *Escherichia coli* (448; 74%), *Klebsiella* species (53; 8.8%), and *Enterococcus* species (52; 8.6%). Among outpatient women aged 20-49 years, *E. coli* was responsible for 82% (9,612/11,730) infections with *Enterococcus* species (356; 3.0%), *Klebsiella pneumoniae* (397; 3.4%), group B streptococcus (359; 3.1%), and *Staphylococcus saprophyticus* (328; 2.8%) accounting for most of the remaining isolates. Of 501 *Staphylococcus saprophyticus* isolates, 422 (84.2%) occurred among females between the ages of 10 and 49 years of age.

Antimicrobial Resistance

The rates of resistance to common anti-microbial agents used to treat UTIs varied significantly ($p < 0.001$) according to the sending location and are shown in the **Table**. In contrast to most other recent studies, we found lower rates of anti-microbial resistance, most notably to SXT (**Table**). Given that our overall rate of resistance was 16%, our data supports recent evidence based Canadian review that recommended that cotrimoxazole remain as a standard empiric agent of choice for uncomplicated cystitis.

Table. Antimicrobial Resistance Amongst Community-onset UTI Pathogens (CHR 2004-05)

Anti-microbial	Outpatients*	Hospital	Nursing home	Overall
SXT	4,318/27,495(15.7)	1,052/6,365(16.5)	666/3,004 (22.2)	6,036/36,864(16.4)
Ciprofloxacin	2,162/29,364 (7.4)	797/7,082 (11.3)	966/3,562 (27.1)	3,925/40,008 (9.8)
Cefazolin	2,462/27,437 (9.0)	761/6,322 (12.0)	544/2,997 (18.2)	3,767/36,778(10.2)
Gentamicin	1,258/27,737 (4.5)	410/6,485 (6.3)	366/3,121 (11.7)	2,034/37,343 (5.5)
Ceftriaxone	690/26,497 (2.6)	231/6,032 (3.8)	144/2,759 (5.2)	1,065/35,288 (3.0)
Nitrofurantoin	2,259/29,090 (7.8)	643/6,941 (9.3)	774/3,443 (22.5)	3,676/39,474 (9.3)

*Outpatients includes outpatients (clinics, physicians' offices, and outpatient collection sites), nursing homes, and hospitals include Emergency departments and hospital inpatients within their first 2 days of admission)

IF YOU HAVE ANY QUESTIONS OR COMMENTS ABOUT HOW THE LABORATORY WORKS, PLEASE CALL US AT 770-3215 (Sandra Corbett, Manager, Microbiology) or 770-3762 (Dr. Dan Gregson, Division Head, Microbiology)