



# Pharmacist Prescribing and Care in Patients with Uncomplicated Urinary Tract Infections in the Community: Antimicrobial Utilization and Stewardship Results of the R<sub>x</sub>OUTMAP Study

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## BACKGROUND

- Urinary tract infections (UTI) are common infections that often result in antibacterial use that is suboptimal, frequently leading to both direct antibacterial adverse events and secondary complications, including infection with *Clostridium difficile* 1-3.
- Antimicrobial stewardship has become an important measure in the struggle to preserve the effectiveness of available antibacterials.
- Although antimicrobial stewardship programs and initiatives have traditionally been localized to hospitals and other institutions, community-based health care professionals also have a very important role to play in antimicrobial stewardship.
- Pharmacists are well-positioned to have important roles in the assessment and management of UTI. In some Canadian provinces, they have the authorization to independently prescribe medications for the treatment of uncomplicated UTI.
- Our objective was to evaluate the appropriateness of antibacterial prescribing by pharmacists for patients with uncomplicated UTI.

## METHODS

- Prospective registry trial in 39 community pharmacies in the Canadian province of New Brunswick. Local UTI guidelines were provided to study pharmacists. Some (~1/3) of pharmacists also received baseline education.
- Patients were included if at least 19 years of age and either presented to the pharmacy with symptoms suggestive of UTI with no current antibacterial treatment (Pharmacist-Initial Arm) or presented to the pharmacy with a new prescription for antibacterial therapy from another health care provider (Physician-Initial Arm).
- Patients were excluded if they had signs or symptoms suggestive of pyelonephritis or systemic illness (flank pain or tenderness, fever (≥ 38°C), rigors, significant nausea/vomiting, and frank hematuria) the presence of complicating factors (male sex, pregnancy, indwelling urinary catheter, poorly controlled diabetes, chronic obstruction, nephrolithiasis, chronic renal insufficiency, and immunosuppression), and if receiving an antibacterial for UTI prophylaxis. They were also excluded if it was their second or more recurrence of UTI in the past 30 days.
- Pharmacists performed patient assessments and either prescribed antibacterial therapy, modified antibacterial therapy, provided education only, or referred to physician, as appropriate.
- Data was collected in a secure, centralized, web-based database.
- Antibacterial therapy was considered guideline-concordant when the following were prescribed in appropriate daily oral dosages: nitrofurantoin for 5 days, trimethoprim-sulfamethoxazole (TMP-SMX) for 3 days, TMP for 3 days, fosfomycin single dose, or cefuroxime axetil for 7 days; or if circumstances warranted usage of a regimen outside of these usual first-line options.
- Between arm comparisons used chi-squared test or Fisher's exact test for categorical variables and t-test was used for continuous variables. Wilcoxon-Mann-Whitney test was used when data deviated from normality.

## RESULTS

- There were 750 patients enrolled (Figure 1). Baseline characteristics are depicted in Table 1.
- The choice of antibacterial agent broken down by arm is depicted in Figure 2.
- Nitrofurantoin was prescribed for 5 days in 97% of Pharmacist-Initial orders (mean 5.1 ± 0.3) compared to Physician-Initial orders where 65% were for greater than 5 days (mean 6.7 ± 1.9; p < 0.001) (Figure 3). TMP-SMX was prescribed for 3 days in 88% of Pharmacist-Initial orders (mean 2.9 ± 0.3) compared to Physician-Initial orders where 63% were for greater than 3 days (mean 4.8 ± 1.6; p < 0.001).
- Therapy was guideline-concordant in 95% of the Pharmacist-Initial orders compared to 35% of Physician-Initial (p < 0.001) (Figure 4).
- In the case of guideline-discordant therapy from physicians, pharmacists prescribed to optimize therapy for 46% of these patients.

## RESULTS (contd.)

Figure 1: Study Flow

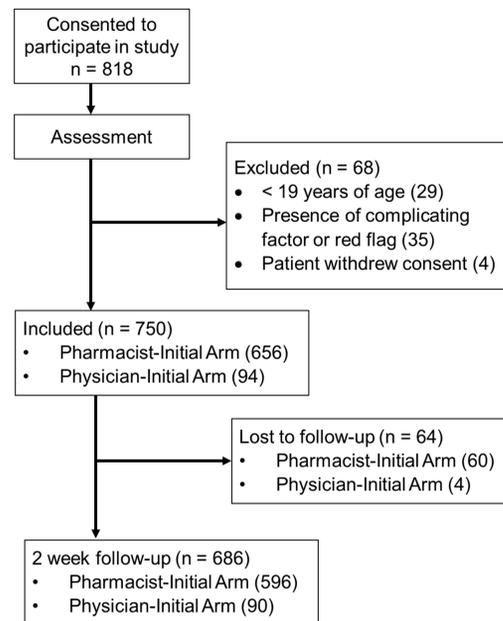


Table 1: Baseline Characteristics

	Pharmacist-Initial Arm (n = 656)	Physician-Initial Arm (n = 94)	Overall (n = 750)	p-value*
Age (Mean ± SD)	40.4 ± 15.9	43.7 ± 16.1	40.9 ± 16.0	0.0692
Weight (in kg) (Mean ± SD)	70.0 ± 17.3	78.2 ± 35.8	71.0 ± 20.7	0.0585
Dysuria – n (%)	556 (84.8)	76 (80.9)	632 (84.3)	0.3308
New or increased urinary frequency – n (%)	597 (91.0)	86 (91.5)	683 (91.1)	0.8779
New or increased urinary urgency – n (%)	525 (80.0)	72 (76.6)	597 (79.6)	0.4396
Suprapubic pain – n (%)	277 (42.2)	53 (56.4)	330 (44.0)	0.0097

\* p-values for between arm comparisons.

Figure 2: Empiric Antibacterial Agent Selection by A) Pharmacist-Initial Arm and B) Physician-Initial Arm

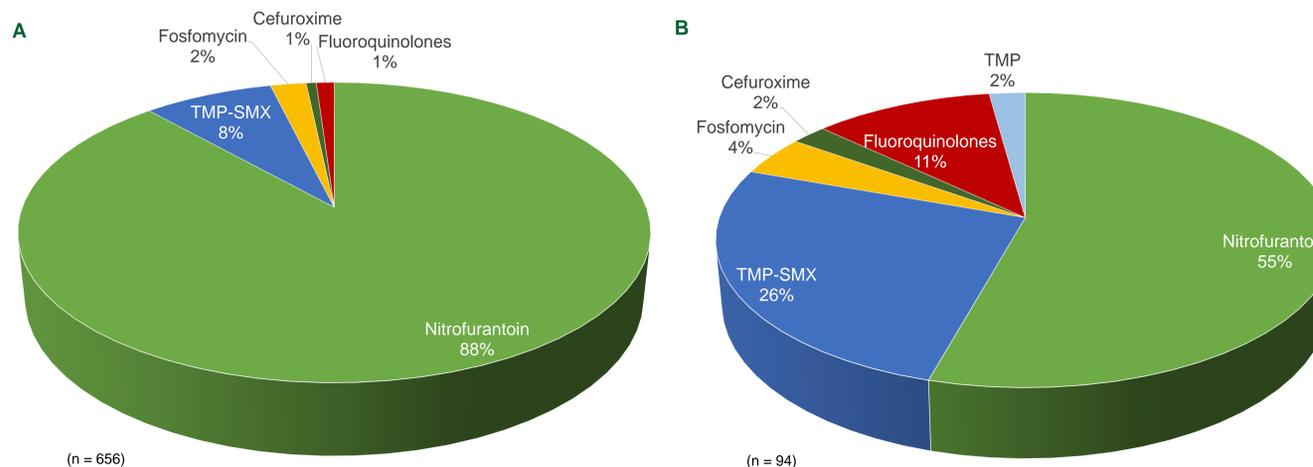
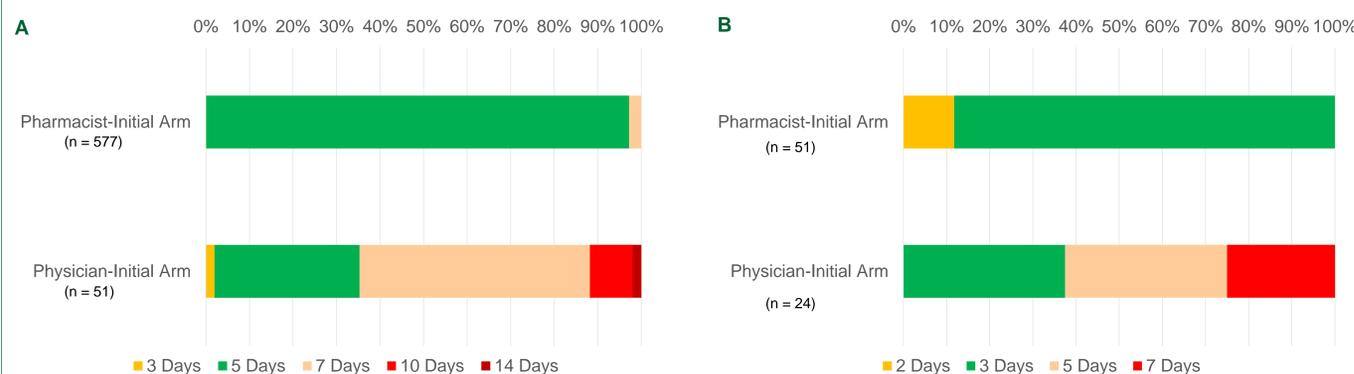
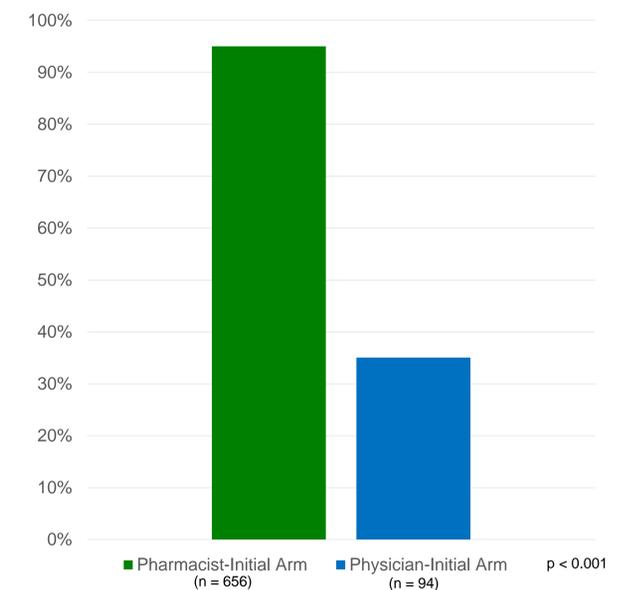


Figure 3: Duration of Therapy for A) Nitrofurantoin and B) Trimethoprim-Sulfamethoxazole Orders



## RESULTS (contd.)

Figure 4: Guideline-Concordance of Initial Antibacterial Prescriptions



## Conclusions

- Antibacterial therapy initiated by pharmacists in the treatment of acute uncomplicated UTI was found to be highly appropriate.
- Therapy initiated by physicians tended to be for durations that are longer than recommended or include fluoroquinolones.
- These results demonstrate an area where antimicrobial stewardship efforts can be directed in the community setting and that pharmacists can play a large role in these interventions.

## References

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