Antimicrobial Stewardship Profile: Markham Stouffville Hospital

Markham Stouffville Hospital is a two-site community hospital with 250+ beds.

Markham Stouffville Hospital offers a broad range of programs and patient services including:

- Acute Care
- Maternal and Child Health
- Medicine
- Surgery
- Mental Health
- Addiction services

ASP Champions (L-R): Dr. Jeya Nadarajah, ASP Lead; ASP Pharmacists Sabrina Chan, Linda Guo and Christine Howe.

Why an Antimicrobial Stewardship Program (ASP)?

Markham Stouffville Hospital proactively launched their ASP in 2008 with the support and commitment of their senior team and the dedication of the medical and pharmacy teams. Director of Pharmacy, Shellyna Moledina, had noted the trend for ASP in the United States and saw programs begin at two large academic centers in Toronto, before she approached administration at Markham Stouffville Hospital to start the program. The hospital's alignment for a program was in place and with the support of administration, Moledina and her pharmacy colleagues formed the hospital's ASP committee.

The committee's first step was the creation of a pharmacist-run IV to PO conversion strategy. This was followed by the creation of pre-printed orders/clinical pathways for community-acquired pneumonia (CAP) and sepsis. When the team audited the use of the CAP pre-printed orders in 2011 they identified the need for formal prospective audit and feedback (PAF) and instituted the process on the medical unit. Next, they audited their surgeons' surgical prophylaxis practices which resulted in the creation surgical prophylaxis guidelines for the hospital. The PAF process eventually grew to include the surgical and medical units.

A team of champions

When Infectious Disease (ID) Physician, Dr. Jeya Nadarajah, assumed the role of ASP lead in 2012, she recognized the program would need at least 0.3 full time equivalent (FTE) hours of ID physician support to effectively formalize the program throughout the hospital. The plan was to expand the ASP pharmacists' role to one FTE position to allow ASP rounding with Nadarajah or ID physician, Dr. Valerie Sales, 5 days per week. And, while the ASP pharmacists already reviewed all medical and surgical unit patients on antibiotics, the program could be extended to include the intensive care unit. Three pharmacists rotate through the ASP postion. They review patients daily and in consultation with the unit clinical pharmacists, they assess antimicrobial therapy based on the

patient's infection, specific modifying factors, and available microbiological data. The ASP team's recommendations may include altering the antimicrobial spectrum of activity, duration of therapy, or discontinuing therapy. Ultimately, their goal is to reduce the risk of antimicrobial-related complications, resistance, potential acquisition of *Clostridium difficile* infection, and reduce the costs of inappropriate therapy. The team has developed a 'culture of respect and trust' within Markham Stouffville Hospital. By routinely meeting with medical staff on each unit to discuss and evaluate the program, they promote the importance of stewardship and open communication. Staff address challenges and formulate solutions together to strengthen the ASP.

Successes

- An ID physician with dedicated time for ASP and one FTE ASP pharmacist
- Fluoroquinolone use decreased by 65% from 2011 to 2014
- Development of evidence-based clinical pathways and pre-printed order sets
- Addition of days of therapy (DOT) to performance indicators

Challenges

- Enhancing the information technology system to produce significant reports
- Acceptance of the pharmacist recommendations without ID intervention by the most responsible physician

Horizon

- Develop a robust communication strategy in collaboration with Public Relations that targets unit staff and clinicians
- Participate in the Regional ASP study (RASP-CAP)

Markham Stouffville Hospital ASP tools and resources

The following resources have been made available by Markham Stouffville Hospital and are examples of tools and resources that support its/an antimicrobial stewardship program:

1. Markham Stouffville Hospital ASP Committee Terms of Reference
2. Markham Stouffville Hospital Pharmacist-initiated IV to PO Conversion of Antimicrobials Policy
3. Markham Stouffville Hospital ASP Team Suggestion Form

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Disclaimer

Citation

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For further information

Antimicrobial Stewardship Program, Infection Prevention and Control, Public Health Ontario.

Email: asp@oahpp.ca

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Resource 1: Markham Stouffville Hospital ASP Committee Terms of Reference

INTERDISCIPLINARY MANUAL

AUTHOR:	Director, Pharmacy	**FOLDER:**	Committees
APPROVED BY:	Medical Advisory Committee	**REVIEW FREQUENCY:**	3 years
ELECTRONIC RESPONSIBILITY:	Director, Professional Practice	**ORIGINAL APPROVAL DATE:**	23/10/2008
POLICY HISTORY/ NUMBER CHANGES	Combined with policies: 090.914.916.010 290.914.916.113 *(Retired xx/08/13)*	**REVISED DATE:** **REVIEWED DATE:**	18/07/2013

090.914.906.025 ANTIMICROBIAL STEWARDSHIP SUBCOMMITTEE TERMS OF REFERENCE

Purpose/Key Function of the Committee:
The Antimicrobial Stewardship Subcommittee, which oversees the activities of the Antimicrobial Stewardship Program (ASP), is a subcommittee of the Drugs and Therapeutics Committee (DTC). The purpose of this subcommittee is to assist in the development and review of processes, guidelines, and standards of the ASP.

The Antimicrobial Stewardship Program

The primary goal of antimicrobial stewardship is to ensure patients are on appropriate antimicrobial therapy and optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms (such as *Clostridium difficile*), and the emergence of resistance.

Optimizing antimicrobial use consists of:

1. Minimizing patient exposure to antimicrobials when possible.
2. Adjusting the agent, dose, duration and route based on patient, disease and drug factors.
3. De-escalating therapy to target a narrow spectrum of pathogens when C&S data is available.

The program is multidisciplinary, composed of an ID physician or microbiologist, ID pharmacist, infection control practitioner and other health care professionals. The primary strategy of the ASP is to prospectively audit all patients being treated with antimicrobials with intervention and feedback. Other ASP strategies may include

Resource 1: Markham Stouffville ASP Committee Terms of Reference cont'd

formulary restriction, automatic stop orders, an antimicrobial step-down program, pre-printed antibiotic orders, guidelines and clinical pathways, selective susceptibility reporting, educational sessions, and restriction of pharmaceutical marketing activities. In addition, various initiatives have been undertaken to minimize admissions to hospital for the sole reason of administering intraveneous antibiotics.

Committee Responsibilities:
The Antimicrobial Stewardship Subcommittee:

- evaluates the ASP program on an ongoing basis, identifies areas for improvement and implements change to the program.
- collects and evaluates ASP process and outcome data and reports quality indicators to hospital administration on a quarterly basis.
- reviews and makes recommendations on policies, procedures, preprinted orders and formulary additions related to antimicrobial use in the hospital prior to review at DTC.
- develops and updates guidelines and policies for the treatment of specific infections and the appropriate use of antimicrobials based on best practice, agent toxicities, resistance trends and cost.
- develops and implements education programs for the professional staff on pertinent matters related to antimicrobials and their use.
- disseminates information about the ASP to the hospital's professional staff by means of a biannual report and presentations to medical staff as deemed appropriate.

Committee Membership:

a) Director, Pharmacy (Chair)
b) Infectious Diseases Specialists (2 Physicians)
c) Pharmacists (3), Infectious Disease
d) Drug Utilization Pharmacist (1)
e) Pharmacy Manager (1)
f) Infection Control Practitioner (1)
g) Physician, Department of Medicine (1)
h) Physician, Department of Surgery (1)
i) Professional Practice Leader (1)
j) Clinical Manger (1)
k) Physician, or delegate, Uxbridge site (1)
l) Information Technology (1), ad hoc
m) Decision Support (1), ad hoc

- All members are voting members of this committee.

Committee Chair:

- Director of Pharmacy, Shellyna Moledina

Information to the Committee:

- *As directed by ID pharmacists, ID physician or ASP team*

Resource 1: Markham Stouffville ASP Committee Terms of Reference cont'd

Frequency of Meetings:
- Meetings will be held monthly prior to scheduled Drugs & Therapeutics Meetings.

Meeting Attendance:

Voting Quorum:
- A quorum shall exist when greater than 50% of the voting membership is present.

Decision Making:
- Decisions are reached by consensus.

Minutes:
- Administrative Assistant, Pharmacy, will record minutes
- Meeting minutes will be kept in the Office of the Director of Pharmacy

Accountability:
- The Antibiotic Subcommittee reports to the Drugs and Therapeutics Committee

***Committee Evaluation*:**

References:

1. Zoutman D, MD: Best Practices for Prevention of Clostridium Difficile: Antimicrobial Stewardship; Provincial Infectious Diseases Advisory Committee (PIDAC) June 26, 2008.

2. Dellit,T;et al: Infectious Diseases Society of America and the Society of Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship. CID 2007:44(15 Jan) 159-177

3. Hand, Kieran; Antibiotic pharmacists in the ascendancy; Journal of Antimicrobial Chemotherapy (2007) 60, Suppl. 1,i73-i76.

Endorsements:
Antibiotic Stewardship Subcommittee
Drugs & Therapeutics Committee

Resource 2: IV TO PO Conversion of Antimicrobials Policy

MARKHAM STOUFFVILLE HOSPITAL CORPORATION

INTERDISCIPLINARY MANUAL

AUTHOR:	Director of Pharmacy	**FOLDER:**	Medication Guidelines & Protocols
APPROVED BY:	DTC	**REVIEW FREQUENCY:**	3 years
RESPONSIBILITY:	Director of Pharmacy	**ORIGINAL APPROVAL DATE:**	14/11/02
POLICY HISTORY/ NUMBER CHANGES:		**REVISED/REVIEWED DATE:**	18/12/08 05/04/12

290.914.916.010 PHARMACIST-INITIATED IV TO PO CONVERSION PROGRAM OF ANTIMICROBIALS

POLICY:

Early conversion from intravenous (IV) to oral (PO) antimicrobials therapy is effective for a variety of infections. Many oral antimicrobials now have available excellent bioavailability. Conversion from IV to PO antimicrobials therapy in selected patients is an effective way of achieving cost savings for the Hospital (drug costs and nursing/pharmacy labour costs) while aiming for a positive clinical outcome. The switch to oral therapy must be individualized based upon the patient's clinical status and infection.

EXPECTED OUTCOME:

Pharmacists will monitor patients receiving IV antimicrobials, determine their eligibility for conversion to oral treatment, and initiate where appropriate the conversion from IV to PO therapy. The conversion will be documented in the patient's electronic record and on the Doctor's Orders sheets. All conversions will be followed to monitor clinical and pharmaco-economic outcomes. (See examples in **Appendix A - Suggested Antimicrobial Conversion Table**)

PROCEDURE/GUIDELINE:

The inclusion criteria for the pharmacist-initiated automatic conversion program include:

Resource 2: IV TO PO Conversion of Antimicrobials Policy cont'd

- The patient has received 48 hours of IV antimicrobials.
- The patient is improving clinically (i.e. afebrile for at least 24 hours, leukocytes normalizing, hemodynamically stable, and not septic).
- The patient has a functional GI tract, is able to take oral or NG nutrition and/or medications and there is no evidence of malabsorption.
- The pathogen is not known to be resistant to the antimicrobial to be used.
- The patient does not fall under the parameters of exclusion (see below)

Patients should NOT be switched to oral therapy if they meet any of the following exclusion criteria:

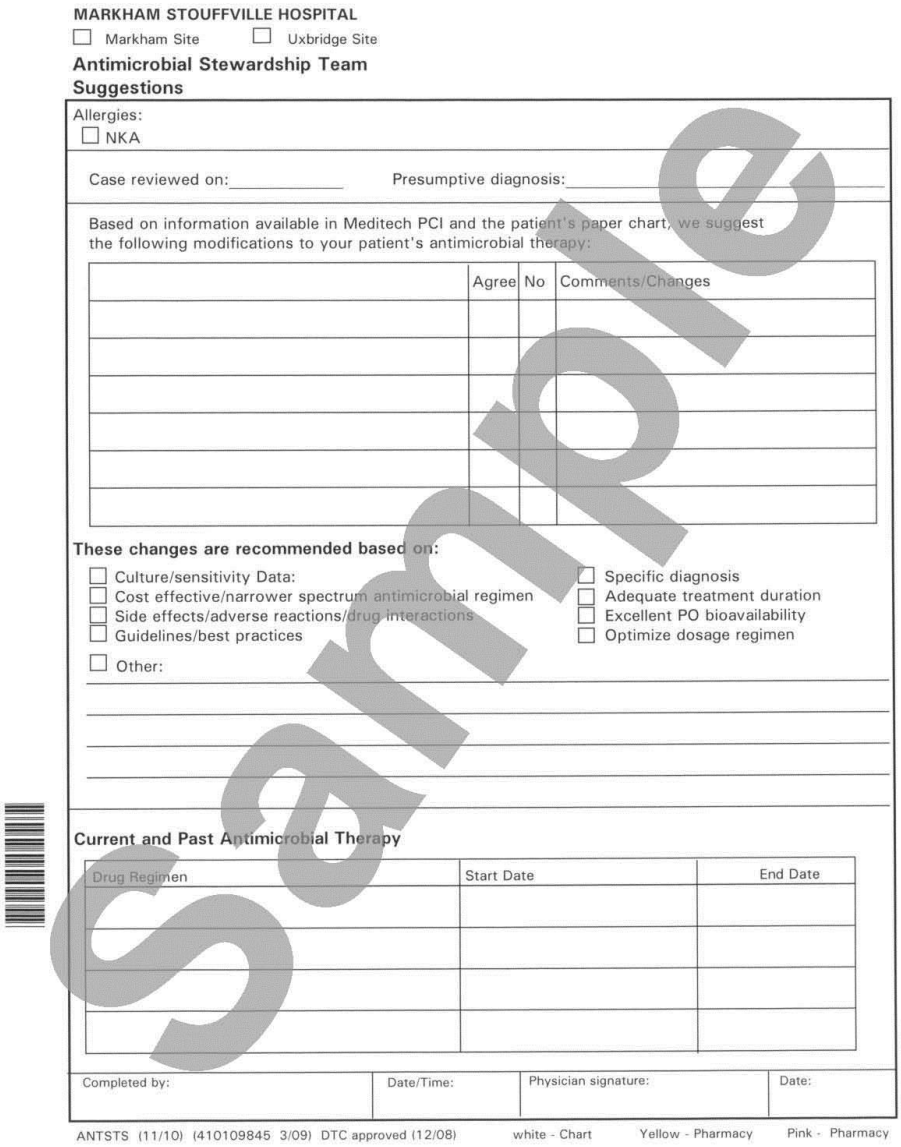
- The patient is being treated for an infection where parenteral therapy is indicated, such as Endocarditis, CNS infection (e.g. meningitis, encephalitis), *S aureus* or *Enterococcus* spp. Bacteremia.
- The patient may have an unreliable response to oral therapy due to continuous NG suction, malabsorption syndrome, ileus, protracted vomiting, severe diarrhea.
- The patient is ≤ 18 years (i.e. Pediatrics).

Resource 2: IV TO PO Conversion of Antimicrobials Policy cont'd

Appendix A - Suggested Antimicrobial Conversion Table

IV Drug	Oral Drug	Cost Savings/Day
Acyclovir 300 mg (5 mg/kg) q8h	Acyclovir 400 mg q8h **OR** Valacyclovir 500 mg q12h	$
Ampicillin 1g q6h	Amoxicillin 500 mg q8h	$
Azithromycin 500 mg q24h	Azithromycin 250 mg q24h	$
Cefazolin 1g q8h	Cephalexin 500 mg q6h	$
Cefuroxime 750 mg q8h	Cefuroxime Axetil 500 mg q12h	$
Ceftazidime 2 g q6h	Ciprofloxacin 750 mg q12h	$
Ceftriaxone 1 g q24h	Ciprofloxacin 500 mg q12h +/- Cephalexin 500 mg q6h	$
Ciprofloxacin 400 mg q12h	Ciprofloxacin 500-750 mg q12h	$
Clindamycin 600 mg q8h	Clindamycin 300 mg q6h	$
Cloxacillin 1 g q6h	Cloxacillin 500 mg q6h	$
Fluconazole 200 mg q24h	Fluconazole 200 mg q24h	$
Gentamicin 300 mg (5 mg/kg) q24h	Ciprofloxacin 500 mg q12h **OR** Trimethoprim/Sulfamethoxazole (SEPTRA) 1 DS q12h	$ $
Meropenem 500 mg q6h	Ciprofloxacin 500-750 mg q12h + Metronidazole 500 mg q12h **OR** Ciprofloxacin 500-750 mg q12h + Clindamycin 300 mg q6h	$ $ $ $
Metronidazole 500 mg q12h	Metronidazole 500 mg q12h	$
Moxifloxacin 400 mg q24h	Moxifloxacin 400 mg q24h	$
Penicillin sodium 4 million units q6h	Penicillin VK 300 mg q6h	$
Piperacillin/Tazobactam 4.5 g q8h	Amoxicillin/clavulanate 500/125 mg q8h **OR** Ciprofloxacin 500-750 mg q12h + Metronidazole 500 mg q12h **OR** Ciprofloxacin 500-750 mg q12h + Clindamycin 300 mg q6h	$ $ $
Tobramycin 300 mg (5 mg/kg) q24h	Ciprofloxacin 750 mg q12h (for *Pseudomonas spp*)	$
Trimethoprim/Sulfamethoxazole (SEPTRA) 10 mL q6h	Trimethoprim/Sulfamethoxazole (SEPTRA) 1 DS q12h	$
Voriconazole 200 mg (4mg/kg) q12h	Voriconazole 200 mg q12h	$

Resource 3: Markham Stouffville ASP Team Suggestions Form



MARKHAM STOUFFVILLE HOSPITAL

☐ Markham Site ☐ Uxbridge Site

Antimicrobial Stewardship Team Suggestions

Allergies:
☐ NKA

Case reviewed on:_____ Presumptive diagnosis:_____

Based on information available in Meditech PCI and the patient's paper chart, we suggest the following modifications to your patient's antimicrobial therapy:

	Agree	No	Comments/Changes

These changes are recommended based on:

☐ Culture/sensitivity Data:
☐ Cost effective/narrower spectrum antimicrobial regimen
☐ Side effects/adverse reactions/drug interactions
☐ Guidelines/best practices
☐ Specific diagnosis
☐ Adequate treatment duration
☐ Excellent PO bioavailability
☐ Optimize dosage regimen
☐ Other:

Current and Past Antimicrobial Therapy

Drug Regimen	Start Date	End Date

Completed by:	Date/Time:	Physician signature:	Date:

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