

Antimicrobial Stewardship (AMS) Program: FY 16/17 Quarter 3 Update

Executive Summary

Best Practices

There is ongoing work to develop and revise clinical tools, protocols and order sets. Items completed and actively developed/ revised include:

- Decompensated Cirrhosis Order set (completed)
- Oseltamivir for Influenza Outbreak order set (completed)
- Antimicrobial Dosing Guidelines for Adults clinical tool 2016/17 update (projected completion Feb 2017)
- Empiric Treatment of Common Infections in Adults clinical tool 2016/17 update (projected completion Feb 2017)
- Revision/regionalization of Sexual Assault Order set (projected completion March 2017)
- Creation/Regionalization of Chronic Obstructive Pulmonary Disorder (COPD) order sets (projected completion April 2017)
- Pharmacist Managed Pharmacokinetic Monitoring and Dosing of Vancomycin and Aminoglycosides clinical practice standard (projected completion March 2017)
- Intravenous to oral antimicrobial conversion order set (pilot project Dawson Creek) – approved; awaiting implementation

Future projects in active initial or planning stages include:

- Revision of Outpatient IV Antimicrobial Therapy options; re-instatement of Cefazolin + Probenecid
- Regional Sepsis protocol revisions/updates
- Pharmacy Resident Research project – Gap analysis of outpatient IV antimicrobial therapy (OPAT) across NH
- Education Module and treatment algorithm development for Urinary Tract Infections (including catheter associated and asymptomatic bacteriuria)
- Education Module development for Community Acquired Pneumonia and Aspiration Pneumonia in Adults

Antimicrobial Usage Metrics

We are continuing to work with IT and data analysts to solve the issue with data integrity identified previously; therefore until the data integrity has been restored the AMS program will not be reporting on antimicrobial usage or overall costs. Our goal is to have this issue rectified by end of quarter 4, in time to produce an annual report.

Clinical Service/Audit & Feedback

Variations of Prospective Audit and Feedback (A&F) of targeted antimicrobials continue to occur at UHNBC, GR Baker, Mills Memorial hospital, Prince Rupert Regional Hospital, Bulkley Valley & District Hospital, Wrinch Memorial Hospital as well as Dawson Creek & District Hospital. Priority sites for this work are identified based on availability of on-site pharmacists; if the pharmacist also provides remote services for a smaller site and workload permits, review of patients at those smaller sites will also occur. Over the quarter 750 patient cases were reviewed and 293 drug therapy problems were identified with a 58% resolution rate. The top 3 drug therapy problems encountered continue to be: A. Unnecessary Antimicrobial Discontinued, B. Suboptimal or ineffective therapy and C. Converting IV antimicrobial to an oral agent.

Patient case reviews at St. John Hospital in Vanderhoof and Fort St. John hospital planned to commence January 30th, 2017 and March 7th, 2017, respectively.

Fiscal Year 16/17 Q3 Results

Please note: the Antimicrobial Stewardship working group has become a permanent committee under the NH Medication Safety and Quality Committee and will now be referred to as the Antimicrobial Stewardship (AMS) Subcommittee

Ongoing Program Initiatives

- I. Clinical tools, standards, policies and education initiatives
- II. Regional Order Set development
- III. Prospective Audit and Feedback service including Outcome and Process Measures

1. Clinical tools, standards, policies and education initiatives

1.1 Antimicrobial Dosing Guidelines for Adults clinical tool 2016/17 update

Ongoing annual revision and update to clinical tool is planned for publication and distribution to clinicians in each HSDA in February 2017.

1.2 Empiric Treatment of Common Infections in Adults clinical tool 2016/17 update

Ongoing annual revision and update to clinical tool is planned for publication and distribution to clinicians in each HSDA in February 2017.

1.3 Pharmacist Managed Pharmacokinetic Monitoring and Dosing of Vancomycin and Aminoglycosides Clinical Practice Standard (projected completion March 2017)

Creation of a new regional clinical practice standard is underway. This CPS will authorize pharmacists to provide monitoring and dosing of vancomycin and aminoglycosides (gentamicin, tobramycin and amikacin). In addition to this policy, there will be updates to pharmacists training of new staff as well as opportunity for current staff to be oriented to the standardized procedure for managing these medications.

1.4 Pharmacy Resident Research project – Gap analysis of outpatient IV antimicrobial therapy (OPAT) across NH

A research project is underway, led by the NH pharmacy resident for 2016/17. He is currently in the data collection phase which involves interviews with a variety of stakeholders at various sites through-out NH. The goal is to provide a gap analysis of current practices for outpatient IV antimicrobial therapy based on standardized criteria found in the literature.

Additionally, he will be developing in collaboration with the AMS subcommittee, a regional order set and clinical practice standard for OPAT in NH. He will have the data from his research ready for review and sharing in May 2017.

2. Regional Order Set development

2.1 Decompensated Cirrhosis Order set

In collaboration with one of our gastroenterologists, the AMS Subcommittee provided feedback and guidance on the antimicrobial orders found within this comprehensive order set. It was approved by NHMAC for regional use and is now available on document source, through the OurNH order set page.

2.2 Oseltamivir for Influenza Outbreak order set

The AMS Subcommittee has revised the **order set** previously titled: Influenza and Pneumococcal Vaccines and the Use of Oseltamivir Orders that is typically used at all Long term care facilities in Northern Health. It is now titled: Oseltamivir for influenza outbreak declared by medical health officer.

This order set has been reviewed by an extensive group of stakeholders. New information you will find in this order set includes:

- Treatment dosing for oseltamivir based on renal function
- Prophylaxis dosing for oseltamivir based on renal function

This order set was approved for regional use and is found on document source via the OurNH order set page.

2.3 Revision/Regionalization of Sexual Assault Order set

Revision to UHNBC's currently existing order set has occurred. Stakeholder feedback has been collected and incorporated. Last step, will be presenting for regional approval at the next NHMAC meeting March 15th.

2.4 Creation/Regionalization of Chronic Obstructive Pulmonary Disorder Acute Exacerbation (COPDAE) order sets

Creation of a new order set for COPDAE was initiated by the Respiratory Therapy group. Draft has been distributed to stakeholder groups. This order set contains admission orders, orders for 48 hours after admission as well as discharge orders which can be sent to a patient's community pharmacy. Current goal is for completion and implementation in April 2017.

2.5 Revision of Outpatient IV Antimicrobial Therapy order set: re-instatement of Cefazolin + Probenecid

Currently there is no regional order set for outpatient IV therapy. In conjunction with the research project discussed above (refer to item 1.4), there is work being done to create a regional order set (using UHNBC's site specific order set) which will include a re-instatement of a previously used management strategy of cefazolin plus probenecid, for outpatient IV management of uncomplicated skin and soft

tissue infections. In 2011, probenecid was removed from the Canadian Market. At that time, ceftriaxone replaced cefazolin plus probenecid in the outpatient setting for skin and soft tissue infections. This is not ideal because ceftriaxone has suboptimal activity against *S. aureus*, has a higher risk for developing *C. difficile* infection and provides unnecessary Gram negative coverage promoting antimicrobial resistance. Gentes and Bolduc (division of Galenova) are now compounding probenecid capsules. Several other Health Authorities (HA) in Canada (including BC) are currently ordering from this manufacturer. The AMS subcommittee is conducting a review and cost analysis to support bringing this product back to NH. Should this be deemed appropriate, it will be added to the regional order set being developed.

2.6 Regional Sepsis protocol revisions/updates

The AMS program coordinator is representing the AMS Subcommittee on a regional working group led by the Critical Care Program Lead. Extensive revisions are underway for this regional document with hopes of shortening the form and updating the content to align with the 2016 Surviving Sepsis guidelines. The working group is still in the revision stage of development.

Future project developments in initial planning stages:

- Education Module and treatment algorithm development for Urinary Tract Infections (including catheter associated and asymptomatic bacteriuria)
- Education Module development for Community Acquired Pneumonia and Aspiration Pneumonia in Adults

3. Prospective Audit and Feedback

Audit and Feedback (A&F) is an evidence-based practice of reviewing a patient's medical chart and diagnostic test results and engaging with prescribers to collaboratively optimize antimicrobial therapies. This practice involves the selection of the most appropriate, narrowest spectrum agent based on clinical status, indication, allergies, culture results, potential drug interactions and adverse effects, taking into account current clinical practice guidelines.

The A&F clinical service and evaluation efforts are focused on:

- optimizing empiric therapies
- targeting therapy based on additional diagnostic information
- optimizing antimicrobial dosing and treatment durations
- converting intravenous (IV) antimicrobials to oral formulations when appropriate to prevent the complications associated with IV agents

- providing education to prescribers on the clinical practice guidelines for the treatment of infections
- promoting consultation of infectious disease specialist when necessary

Efforts for bi-weekly to weekly review of patients on antimicrobials continue at UHNBC, GR Baker and Mills Memorial hospital, Prince Rupert Regional Hospital, Bulkley Valley & District Hospital, Wrinch Memorial Hospital and Dawson Creek & District Hospital. Plans for St. John Hospital in Vanderhoof to commence reviews in January 2017 are underway. Incorporation of Fort St. John hospital for patient reviews will commence in March 2017.

3.1 Outcome Measure Evaluation: Antibiotic Utilization across NH

Antibiotic utilization, measured in defined daily dose (DDD) per 100 patient-days, is calculated to track the utilization trend over time. The DDD is the assumed average adult maintenance dose per day for a drug used for its main indication. The conversion of drug utilization amount to DDD units is performed to standardize utilization of different classes of antibiotics, allowing comparisons to be made across different facilities or patient groups (excluding pediatric populations). Please note that due to identified issues of data integrity, the AMS program is re-evaluating how data is collected and analyzed. Therefore we are unable to report on antimicrobial consumption and costs across the health authority at this time. We hope to rectify this issue in time for the annual report.

3.2 Process Measure Evaluation: Audit and Feedback Recommendations and Acceptance rates

Variations of prospective audit and feedback (A&F) of targeted antimicrobials are currently occurring at UHNBC, GR Baker, Mills Memorial, Bulkley Valley & District, Wrinch Memorial, Prince Rupert Regional and Dawson Creek & District Hospitals. This process involves assessment of patients on antimicrobial therapy evaluated against recommended therapies according to infectious disease resources and guidelines to ensure the optimal use of drug therapy. This strategy is employed after the drug has been initiated; currently reviews are being done on a weekly to biweekly basis for rural sites and 3 times a week for specific wards at UHNBC. Initiation of A&F at sites outside UHNBC is occurring in a stepwise approach (see Table 2).

Table 2

Site	Date initiated
GR Baker Memorial Hospital	May 13, 2016
Mills Memorial Hospital	June 7, 2016
Kitimat General Hospital	June 9, 2016**
Bulkley Valley & District Hospital	July 6, 2016
Wrinch Memorial Hospital	July 6, 2016
Prince Rupert Regional Hospital	July 7, 2016

Dawson Creek & District Hospital	Sept 6, 2016
St. John Hospital	Jan 30 th , 2017
Lakes District Hospital	Jan 30 th , 2017
Stuart Lake Hospital	Jan 30 th , 2017
Fort St. John Hospital	Due to start March 7 th , 2017

**Due to absence of on-site pharmacist resources, reviews for Kitimat General Hospital have been put on hold

Analysis of the cases reviewed, drug therapy problems identified and resolved was done collectively for all sites active at any point during quarter 3 (see Table 3).

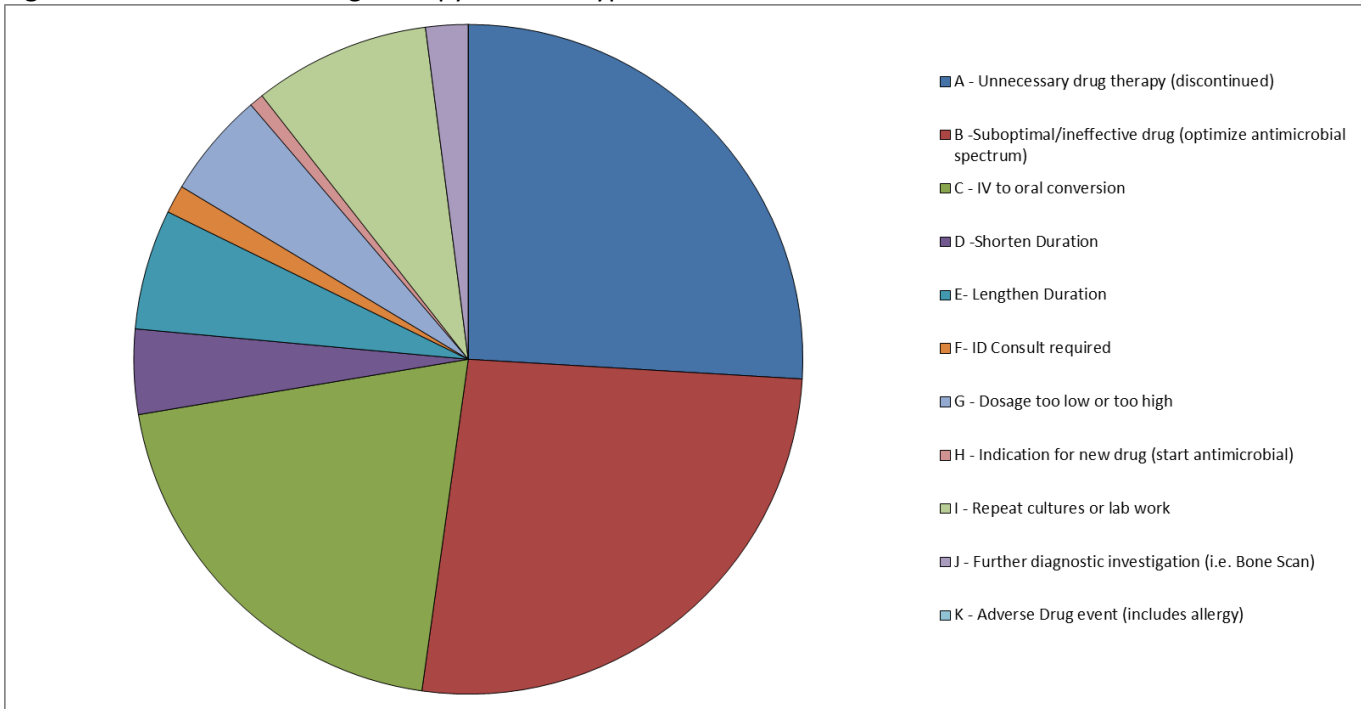
Table 3 - Audit and Feedback antimicrobial drug therapy problem resolutions; (Sept 9 – Dec 1st, 2016)

Measure	Number of Patients
Patient Chart Reviewed	750
Antimicrobial therapy problems identified	293
	Resolution Rate (%)
Antimicrobial therapy recommendations resolved	58
Antimicrobial therapy problems not resolved due to pharmacist workload	22

Antimicrobial therapy recommendations resolved, captures problems that the pharmacist resolved on their own (i.e. dose optimization, ordering necessary blood work for monitoring etc.) or recommendations made to the appropriate physician which were accepted. The resolution rate (referred to as acceptance rate in previous reports) has increased from previous quarters; our goal is to maintain this level above 50% moving forward with a target of 80%. Issues which go unresolved because the pharmacist is unable to follow through due to workload constraints represents 22% of the drug therapy problems identified this quarter. At this time we have not captured the rate of issues which go unresolved because the patient was discharged before the issue was rectified, however this information will be available for the next quarter. We will continue to monitor issues unresolved due to pharmacist workload constraints to ensure it doesn't increase as this identifies an issue with our current system and will warrant further review of resources.

There are a variety of types of antimicrobial therapy problems: Figure 10 displays various types of drug therapy problems **identified**.

Figure 10 - Antimicrobial Drug Therapy Problem Types



The top 3 drug therapy problems encountered continue to be:

- A. Unnecessary Antimicrobial Discontinued
- B. Change in therapy to optimize microbial spectrum
- C. Converting IV therapy to an oral agent.

Note: these proportions reflect **identified** drug therapy problems only

The AMS program will continue to provide quarterly updates to ensure tracking of antimicrobial usage (once data integrity restored) and resolution rates of drug therapy problems identified during A&F and to provide updates on clinical project development and program. For any questions regarding this report or the AMS program please contact the program coordinator (Alicia Ridgewell) at 250-565-5956 or via email alicia.ridgewell@northernhealth.ca.

Acknowledgements for work done in the AMS Program

The Antimicrobial Stewardship Subcommittee (AMSSC) is an inter-disciplinary subcommittee, mandated as a sub-committee of the NH Medication Safety & Quality Committee (NHMSQC).

Members (As of Dec 1st, 2016)

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