

Antimicrobial Stewardship (AMS) Program: FY 17/18 Quarter 1

Executive Summary

Best Practices

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

- Creation/Regionalization of Chronic Obstructive Pulmonary Disorder (COPD) order sets (projected completion September 2017)
- Pharmacist Managed Pharmacokinetic Monitoring and Dosing of Vancomycin and Aminoglycosides clinical practice standard (projected completion Nov. 2017)
- Intravenous to oral antimicrobial conversion order set (pilot project Dawson Creek)
- Revision of Outpatient IV Antimicrobial Therapy options; re-instatement of Cefazolin + Probenacid (order set completion projected September 2017)
- Regional Sepsis protocol revisions/updates (projected completion September 2017)
- Development of Antimicrobial Stewardship webpage on physicians website
- Research study: Evaluation of *Clostridium Difficile* Infection Risk Factors and Management at a University Teaching Hospital in Northern BC.
- Antimicrobial Dosing Guidelines for Adults clinical tool 2016/17 update (completed April 2017)
- Empiric Treatment of Common Infections in Adults clinical tool 2016/17 update (completed April 2017)
- Update and distribution of 2017 Antibigram (completed April 2017)

Future projects in active initial or planning stages include:

- Education Module and treatment algorithm development for Urinary Tract Infections (including catheter associated and asymptomatic bacteriuria)

- Education Module development for Community Acquired Pneumonia, Aspiration Pneumonia and Hospital Acquired pneumonia in Adults
- Surgical prophylaxis guidelines
- Management of bacteremia clinical practice standard

Antimicrobial Usage Metrics

Due to the unforeseen circumstances of the Cariboo Wildfire and resource allocation required to accommodate the evacuees sent to Prince George, our data analyst was unable to provide an update on the antimicrobial usage metrics. We are aiming to provide this data in the quarter 2 report.

Clinical Service/Audit & Feedback

Variations of Prospective Audit and Feedback (A&F) of targeted antimicrobials continue to occur at GR Baker, Mills Memorial Hospital, Prince Rupert Regional Hospital, Bulkley Valley & District Hospital, Wrinch Memorial Hospital and the Omineca Lakes District facilities. During this quarter, A&F reviews were on hold at UHNBC, Fort St. John Hospital, Dawson Creek & District Hospital and Prince Rupert Regional Hospital, due to reduced pharmacist staffing and clinical pharmacists training and development. MMH has joined GR Baker in conducting a more independent model for identifying and resolving drug therapy problems related to antimicrobials. Over the quarter approx. 471 patient cases were reviewed and 229 drug therapy problems were identified with a 71% 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 will resume at PRRH in July 2017 and commence at Kitimat General Hospital in September 2017.

Fiscal Year 17/18 Quarter 1

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

I. Clinical tools, standards, policies and education initiatives

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

Annual revision/update to clinical tool has been completed and published. Distribution to clinicians in each HSDA completed.

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

Annual revision/update to clinical tool has been completed and published. Distribution to clinicians in each HSDA completed.

1.3 NH Antibiogram 2017 update (2016 data)

AMS subcommittee assisted the Microbiology Quality Resource Technologist with reviewing changes and updates to the antibiogram compiled for each HSDA. AMS program coordinator arranged distribution to clinicians in each HSDA (completed).

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

Creation of a new regional clinical practice standard (CPS) has been underway. The original intent of this CPS was to authorize pharmacists to provide monitoring and dosing of vancomycin and aminoglycosides (gentamicin, tobramycin and amikacin). The draft of this policy has been reviewed by the pharmacy group and has received some feedback from the AMS medical Lead suggesting that a secondary CPS be created to assist physicians with initiating these medications prior to pharmacist involvement, which will be especially useful at sites with limited pharmacist resources. 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.

1.5 Research study: Evaluation of *Clostridium Difficile* Infection Risk Factors and Management at a University Teaching Hospital in Northern BC.

The primary objective of this research project is to assess if management of *Clostridium difficile* infection (CDI) complies with provincial and national standards in the absence of Health Authority CDI management support tools.

The secondary objectives of this research project are a) to identify the proportion of CDI patients who had modifiable risk factors, such as presence of antibiotics, whether antibiotics were broad spectrum or of prolonged duration, presence of proton-pump inhibitors (PPIs) or histamine-2 antagonists (H2RAs) and b) patient outcomes such as length of hospital stay, mortality rate and recurrence rate.

Data collection continues in quarter 1 and will be continued in quarter 2. This process involves reviewing paper and electronic chart info for patients discharged from hospital April 1st, 2010 to March 31st, 2016 with positive *C.diff.* EIA toxin and PCR test. Patients will be included if they have a positive stool sample collected greater than 72 hours after admission or less than 72 hours after admission but with a recent discharge from UHNBC within the previous 4 weeks. Patients will be excluded if the admitting diagnosis is infectious diarrhea with no previous admission to UHNBC in prior 4 weeks.

1.6 Development of Antimicrobial Stewardship webpage on physician's website

Plans for a dedicated AMS page on the Northern Health Physicians Resource page (<https://physicians.northernhealth.ca/>) were discussed at the end of quarter 1. Approval to develop has been given and set up will commence in quarter 2. Items which will be available on this page will include (but are not limited too) AMS program quarterly and annual reports, bulletins/announcements, program developed clinical tools, AMS/infectious disease related resources as well as AMS related order sets and clinical practice standards.

II. Regional Order Set development

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

Creation of 3 new regional order sets for COPDAE is underway; led by the Respiratory Therapy group with support from the AMS subcommittee. Drafts have been distributed to stakeholder groups and feedback received. These order sets include admission orders, orders for 48 hours after admission as well as discharge orders which can be sent to a patient's community pharmacy. Currently incorporation of stakeholder feedback is underway and discussions around such revisions are occurring; goal for completion and presentation to NHMAC in Sept 2017.

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

Probenecid was made available for prescribing region wide on May 1st/17. This combination therapy has been added to the regional order set being developed. This order set has been vetted by a variety of stakeholders and incorporation of feedback is underway. Currently awaiting review by the AMS subcommittee for any further changes; goal for completion and presentation to NHMAC in Sept 2017.

2.3 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. Extensive revisions have been carried out and will soon be distributed for stakeholder feedback.

2.4 Intravenous to oral antimicrobial conversion order set (pilot project Dawson Creek and GR Baker)

Appropriate IV to PO antibiotic conversion has wide-ranging potential clinical and financial benefits for stakeholders at multiple levels of the healthcare system, however there is concern that current practices in Northern Health often overlook or forego the opportunity to transition a patient from IV to oral antibiotics before course completion. Reasons for this include: apprehension regarding the effectiveness of subsequent oral therapy, minimized ability of clinicians to schedule appropriate follow up or lack of awareness of the benefits of IV to PO antibiotic conversion.

It was proposed by the site pharmacist in Dawson Creek, that an order set specific towards conversion from IV antimicrobials to oral antimicrobials may provide an opportunity to prompt these type of patient reassessments as well as provide clear guidelines for appropriate situations for oral conversion. This order set was created on a site specific basis to be trialed in Dawson Creek and later was requested to be used at GR Baker. Due to pharmacist workload the use of this order set has not yet proven fruitful.

We will be reviewing utility of this order set as part of a proposed research project for this year's pharmacy residents.

Future project developments in initial planning stages:

The AMS program coordinator has been granted resources via pharmacy student summer employment to aid with development of learning modules for pharmacists and other health care providers. Priority topics include:

- Urinary Tract Infections (including catheter associated and asymptomatic bacteriuria)
- Community Acquired Pneumonia and Aspiration Pneumonia in Adults
- Hospital Acquired Pneumonia

Development of these online modules will be happening over the summer months with plans for launching on the learning hub for easy access across the region.

III. 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.

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

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

Efforts for bi-weekly to weekly review of patients on antimicrobials are currently active at GR Baker and Mills Memorial Hospital, Prince Rupert Regional Hospital, Bulkley Valley & District Hospital, Wrinch Memorial Hospital and the Omineca Lakes District facilities. This focused practice is on hold currently in Fort St. John Hospital, awaiting clinical pharmacist development and is planned to commence in Kitimat General Hospital in September 2017.

An intravenous to oral antimicrobial conversion order set has been developed and approved for use in the Dawson Creek District Hospital. Due to pharmacist work load constraints the AMS focus at this site will be using this order set and encouraging IV to PO step down. A pilot project was started in March 2017, however has not been implemented fully due to reduced staff levels over the summer period. Use of this order set will be reviewed in September.

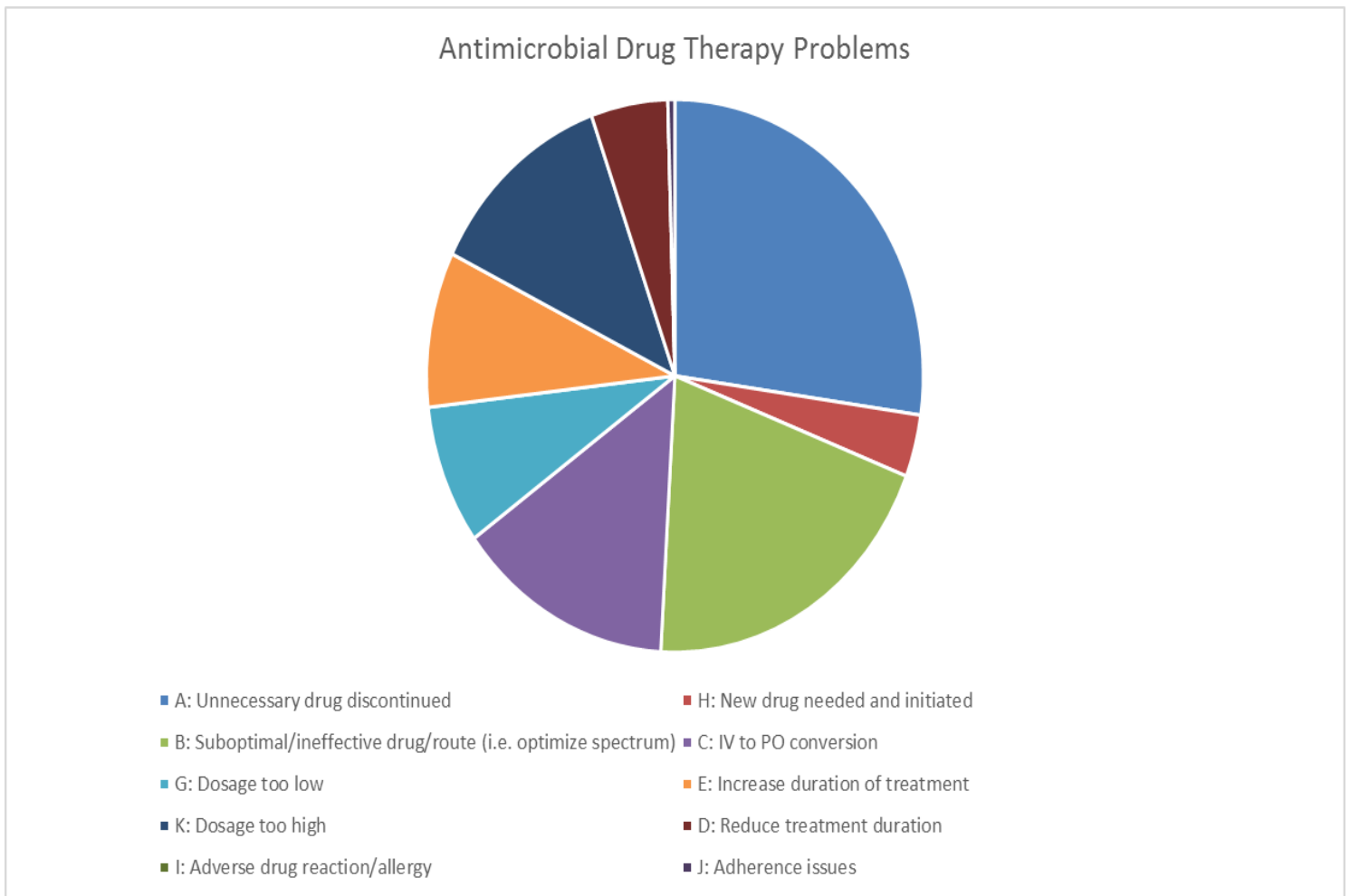
Collation of data for number of cases reviewed, drug therapy problems identified and resolved was done for all sites active at any point during quarter 1 (see Table 3).

Table 3 - Audit and Feedback antimicrobial drug therapy problem resolutions; (Apr 1st – June 15th, 2017)

Measure	Number of Patients
Patient Chart Reviewed	471
Antimicrobial therapy problems identified	229
Antimicrobial therapy recommendations resolved	163 (71%)
Total unresolved antimicrobial drug therapy problems	64
Unresolved drug therapy problems due to pharmacist workload demands	15 (23%)
Unresolved drug therapy problems due to patient discharge	12 (19%)

Antimicrobial therapy recommendations resolved, captures problems that the pharmacist resolved on their own (e.g. dose optimization) or recommendations made to and accepted by the appropriate physician (e.g. discontinuing an unnecessary antimicrobial or changing agents based on culture results). The resolution rate (71%) has continued to increase 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 23% of the unresolved drug therapy problems and 6.6% of all identified drug therapy problems this quarter; this proportion has improved drastically) compared to quarter 4 of last fiscal (previously 56 and 22% respectively) however the total number of patients assessed and therefore DTPs identified is much lower. Unresolved issues due to patient’s discharge occurring before interventions could be made equate to 19% of the unresolved drug therapy problems and only 5.2% of all identified drug therapy problems. 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



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

The top 3 drug therapy problems encountered continue to be: A. Unnecessary Antimicrobial Discontinued, B. Change in therapy to optimize microbial spectrum and C. Converting IV therapy to an oral agent, however we see that DTP category K. Dose too high has increased and is only 2% lower than C. IV to PO conversion.

3.2 Outcome Measure Evaluation: Antibiotic Utilization across NH

The Cariboo Region wildfire has required a lot of resources and staff to be re-allocated to support services for evacuees. Due to this (in addition to on-going challenges with data software), our data analyst support for the AMS program was unable to provide antimicrobial metric measures this quarter. We hope that the devastating fire situation resolves sufficiently in time to provide metrics with the quarter 2 update.

Thank you to all our stakeholders for your continued interest. If you have any suggestions or requests for reports moving forward or any questions regarding this report or the AMS program please contact the program coordinator (Alicia Rahier [prev. Ridgewell]) at: 250-565-5956 or via email alicia.rahier@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 July 1st, 2017)

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