Minnesota Action Plan for the Prevention of Healthcare-Associated Infections

January 2019

Minnesota Department of Health
Healthcare-Associated Infections and Antimicrobial Resistance Section
PO Box 64975
St. Paul, MN 55164-0975
651-201-5414 | 1-877-676-5414
health.hai@state.mn.us
www.health.state.mn.us

04/29/19

To obtain this information in a different format, call: 651-201-5414.

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Introduction

This is the fourth version of the Minnesota Action Plan for the Prevention of Healthcare-Associated Infections (MAPPHAIs). The first was written in 2009-2010 using a template provided by the U.S. Centers for Disease Control and Prevention (CDC). The U.S. Department of Health and Human Services (HHS) required each state to establish its own action plan in conjunction with the National Action Plan to Prevent HAIs: Roadmap to Elimination. For a full description of the history, see Appendix A.

What is it?

The MAPPHAIs is a document that describes what the priorities are for the prevention of HAIs and antimicrobial resistance (AR) in Minnesota. It outlines the objectives and strategies for the Minnesota Department of Health (MDH) and HAI prevention partners at a high level. Minnesota stakeholders who are part of the Minnesota HAI Prevention Advisory Group (HAI AG) determine the priorities. Subcommittees of the Advisory Group and other stakeholders are consulted in determining specific objectives and strategies.

The plan is in no way intended to capture all work aimed at reducing HAIs and AR nor does it imply that other work is not critically important. For example, using containment strategies to prevent transmission of emerging and novel multidrug-resistant organisms is of vital importance. The same is true for ensuring preparedness for high consequence infectious diseases such as Ebola. These and other efforts are ongoing but not addressed here.

Why an Action Plan?

Resources that can be devoted to HAI and AR are finite. Therefore, it is important that the agencies and departments that address these problems work together to avoid duplication of effort and to take advantage of each other's strengths toward achieving common goals. In order to do this effectively, partners must agree on the common goals and how best to reach them. The creation of the Action Plan provides an opportunity for dialogue among stakeholders to ensure that there is agreement on goals and objectives. The plan itself provides a tangible document for reference as partners carry out their HAI and AR prevention work.

Who developed it?

The primary role of the HAI AG is to maintain the Action Plan. It reviews the plan annually, taking into account surveillance data included in a progress report and accomplishments in meeting the previous year's Action Plan objectives. The group determines if priorities remain the same or if new priorities have emerged. The group as a whole and/or subcommittees determine how objectives and strategies need to change in order to facilitate progress.

The HAI AG is comprised of partners and stakeholders that have a role and/or interest in preventing HAIs. It includes infection preventionists, hospital epidemiologists, and other health care professionals from across the spectrum of health, as well as representatives from quality improvement organizations and several MDH divisions including state surveyors, laboratorians, and health policy. For a complete listing of organizations, see Appendix B.

2019 Action Plan

The four areas deemed as priorities for 2019 are multidrug-resistant organisms, antimicrobial stewardship, communication during care transitions, and safe infection prevention and control practices in non-regulated clinical settings. The following pages describe the priorities more fully and include the strategies intended to address them.

Multidrug-resistant Organisms (MDROs)

Statement

While it is important to strive for the prevention of all healthcare-associated infections (HAI), certain organisms – including multidrug-resistant organisms (MDRO) – pose an especially serious and urgent threat. Infections caused by such highly resistant pathogens are nearly untreatable due to the limited number of effective antimicrobials in existence, resulting in increased morbidity and mortality.

Description

Multitudes of health care facilities such as acute, long-term, ambulatory, and home care have observed an increased patient population with MDRO colonization and/or infection. The types of MDRO infections are varied and include MRSA, VRE, resistant gram negatives such as ESBL and CRE, and *Candida auris* (note Table 1 below). Other types of healthcare-associated infections such as *Clostridioides difficile* are of epidemiological importance but may not be a multidrug-resistant organism. The MDRO Advisory Committee will address epidemiologically important organisms in their recommendations. Risk factors for the development of MDRO infections include prolonged hospitalization, exposure to broad-spectrum antimicrobials, invasive medical devices, repeated contact with the health care system, and hospitalization overseas. However, it is important to note that a growing number of MDRO infections are determined to occur via community transmission. Drug-resistant TB is also a significant concern, but it is outside of the scope of this advisory committee.

Current MDH recommendations regarding MDROs are in need of updating. The MDRO Advisory Committee develops resources with the intention to enhance rather than duplicate existing published recommendations and guidelines. Recommendations developed by this advisory committee are not to serve as requirements as they may need to be adapted based on individual facility risk, workflow, and population served. Each facility will need to determine how to implement the recommendations constructed by the advisory committee for the best outcome in its facility.

Table 1. Description of MRDOs and Other Epidemiologically Important Organisms

Abbreviation	Full Name	Brief Description
MRSA	Methicillin-resistant *Staphylococcus aureus*	Resistance to methicillin and related antibiotics (e.g., nafcillin, oxacillin) and resistance to cephalosporins are of concern.

Abbreviation	Full Name	Brief Description
VRE	Vancomycin-resistant *Enterococcus*	Some *Enterococcus* strains are resistant to vancomycin, an antibiotic of last resort, leaving few or no treatment options.
CRE	Carbapenem-resistant Enterobacteriaceae	Resistant to all or nearly all of the antibiotics we have today. Some common types of CRE are carbapenem-resistant *Enterobacter cloacae*, *Klebsiella* spp., and *E. coli.* Carbapenemase-producing CRE (CP-CRE) are of particular concern due to the high level of resistance observed and their greater potential to spread in health care facilities.
ESBL	Extended Spectrum β-Lactamase producing Enterobacteriaceae	Extended-spectrum β-lactamase is an enzyme that allows bacteria to become resistant to a wide variety of penicillins and cephalosporins.
C. auris	*Candida auris*	*Candida auris* is an emerging fungal pathogen that is often multidrug-resistant, is difficult to identify in clinical laboratories, and has caused numerous outbreaks in health care settings worldwide.
C. Diff	*Clostridioides difficile* (formerly *Clostridium difficile)*	May cause life-threatening diarrhea in people who have had recent medical care and antibiotics. Although resistance to the antibiotics used to treat *Clostridioides difficile* is not yet a problem, this bacteria is naturally resistant to many drugs used to treat other infections.

Descriptions adapted from CDC's Antibiotic Resistance Threats in the United States, 2013 (PDF) (https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf).

Goal

Provide recommendations for health care facilities so they can design protocols and make decisions regarding MDRO identification, isolation, and containment.

Objectives

- Review, update, and streamline MDH materials regarding MDRO infection prevention and control strategies by November 29, 2019.
- Ensure that resource materials will include accurate and easily understood information on best practices for the prevention and control of infections due to MDROs (i.e., risk assessment, surveillance, and isolation).
- Design resources to assist all health care workers and providers, regardless of work setting, to be knowledgeable of their responsibilities related to MDRO prevention and control.

- Share updated resources with acute, long-term, ambulatory, and home care facilities throughout the state by December 31, 2019.
- Assist infection preventionists, laboratorians, and other health care providers to become knowledgeable about novel MDROs and increase their awareness about public health resources available to assist with containment strategies.
- Create materials for patient, family, and community education.

Strategies

- The MDRO Advisory Committee will be comprised of MDH staff and multidisciplinary external partners.
- The MDRO Advisory Committee will meet on a monthly basis. (MDH staff will meet every other month, and the full advisory committee will meet on opposite months.)
  - MDH staff will organize and facilitate meetings.
- The MDRO Advisory Committee will review and revise current MDH materials regarding MDROs and epidemiologically important organisms.
  - MDH staff will be the primary points of contact for revision and will organize feedback and guidance to either update resources or construct first drafts of needed materials.
  - MDRO Advisory Committee resources will be accurate, concise, and provide references for infection preventionists, providers, and frontline staff.
- Staff from the MDH communications unit will ensure that materials are compliant with web requirements and are easily accessible and understandable.
  - Messaging to health care facilities will be promoted via the Compendium. The MDH Compendium is a list of health care contacts who receive emails containing targeted alerts, advisory messages, and information regarding educational opportunities.

Deliverables

Upon conclusion of the MDRO Advisory Committee, a single resource will be developed which can be used by all settings of care in identification, management, and containment of epidemiologically significant microorganisms including MDROs.

Antimicrobial Stewardship

Statement

While there are numerous reasons that antimicrobial stewardship is important, a major reason is that overuse and suboptimal use of antimicrobials contributes significantly to antimicrobial resistance (AR). AR has reached crisis levels, leaving some infections with few if any viable options for antimicrobial treatment.

Description

The types, incidence, and levels of antimicrobial resistance of multidrug-resistant organisms (MDROs) continue to grow. New resistance mechanisms (e.g., in carbapenemase-producing organisms) and highly resistant pathogens (e.g., *Candida auris*) continue to emerge. Good infection prevention practices are vitally important to prevent transmission of MDROs but are not sufficient to stem the development and spread of these MDROs. Historically, antibiotics

have been used liberally to treat infections that are almost certainly viral. Broad-spectrum antibiotics have been used when narrow-spectrum antibiotics could have been equally effective. Care has not been taken to limit antibiotic use to sufficiently effective routes, doses, and duration. Similar liberal use in the animal population including food animals has also contributed to emergence of MDROs.

Antimicrobial stewardship is now getting greater attention internationally, nationally, and locally. The Centers for Disease Control and Prevention (CDC) has identified the core elements necessary for successful antimicrobial stewardship programs (ASPs) across settings of care (acute care, long-term care, and ambulatory settings). For the most part, the 'what' of antimicrobial stewardship has been identified, but much work remains on the 'how' of implementing the identified strategies.

Goal

Prescribers, providers, and the public in Minnesota are aware of the importance of antimicrobial stewardship and have the tools necessary to use antimicrobials optimally. All health care settings involved in prescribing and administering antimicrobials have effective ASPs in place. Ultimately, the incidence of MDROs decreases.

Objectives, Strategies, and Deliverables

Minnesota is very fortunate to have a robust statewide antimicrobial stewardship collaborative, the Minnesota One Health Antibiotic Stewardship Collaborative (MOHASC). MOHASC has the One Health Minnesota Antibiotic Stewardship Collaborative Five-Year Strategic Plan (PDF) (https://www.health.state.mn.us/communities/onehealthabx/about/plan.pdf), which takes a One Health approach to encouraging good stewardship and judicious use of antimicrobials. Rather than develop another plan that could hamper the efforts of MOHASC, the Minnesota HAI Prevention Advisory Group supports MOHASC and the implementation of its strategic plan.

Communication during Care Transitions

Statement

A frequent refrain heard from health care settings when discussing improving antimicrobial stewardship and reducing transmission of multidrug-resistant organisms (MDROs) is that there is poor communication between settings when a patient or resident transfers to a new setting. It is important that facilities and providers communicate about the presence of infections (or colonization in the case of MDROs) and details of any antimicrobial treatment to receiving facilities/providers, patients, and their families to ensure safe and effective care.

Description

All too often, information about patient infections, MDRO colonization, or antimicrobial use is not conveyed to the receiving facility or provider when a patient transfers from one setting to another. This can happen in any direction (e.g., from hospital to long-term care or vice versa) and in any type of setting whether inpatient or ambulatory (e.g., between an emergency department and primary care provider). When this occurs, a patient or resident with an active infection or colonization with an emerging MDRO may not be recognized and the receiving

facility is not aware that specific transmission precautions are necessary to prevent the spread of infection or organism. In this case, especially in a group living setting, organism transmission to multiple patients, residents, and/or health care workers can occur before it is recognized.

If information about antimicrobial therapy is not shared, the receiving entity may not be in a position to determine why the antimicrobial is being given or how long it should be continued, if at all, making it impossible to use good stewardship practices.

Following is another example of the importance of communication. When a hemodialysis patient has had a positive blood culture collected in the emergency department or inpatient setting, if the hemodialysis center (HDC) is not informed, it is deprived of important information regarding its quality of care. The HDC is also responsible for reporting bloodstream infections to the National Healthcare Safety Network (NHSN). If they are not informed, NHSN data is also incomplete and the incidence of dialysis-related bloodstream infections is underestimated.

Poor communication between facilities and providers thwarts efforts to reduce the transmission of MDROs, to improve antimicrobial stewardship, and perpetuates the cycle of ever-increasing antimicrobial resistant organisms.

Objectives

- Identify other efforts in the state to improve health care transitions and either participate in or align with those efforts by May 2019.
- Identify and report the major barriers to effective care transition communication (verbal, written, or electronic) about infections, MDROs, and antimicrobial use between hospitals (including emergency departments), long-term acute care hospitals, skilled nursing facilities, and HDCs in Minnesota to the Advisory Group by August 2019.
- Compile learnings from existing projects in the state to improve HAI and antimicrobial resistance communication between health care settings and incorporate these into a report/tool that can be shared with other regions/health care groups to adapt for their own use by the annual in-person HAI Advisory Group meeting in October 2019.
- Identify information technology (IT) tools that can streamline and improve communication at the time of care transitions and share this information with the HAI Advisory Group at its meeting in October 2019.
- Consult the HAI Advisory Group at its October meeting on objectives and next steps for the following year to improve communication about infections, MDROs, and antimicrobial use during care transitions.

Strategies

- Establish and convene a Healthcare-Associated Infection & Antimicrobial Resistance (HAI/AR) Care Transitions Advisory Committee (including members with IT expertise) to provide direction and oversight to the effort to improve communication regarding infections (including MDROs and colonization with emerging/novel MDROs) and antimicrobial use.
- Determine from the Care Transitions Advisory Committee what other care transitions efforts exist and determine how the committee will work with them.
- Determine the need for outreach (such as requests in newsletters) to comprehensively identify current efforts to improve care transitions in Minnesota.

- Review and summarize material from the 2017 and 2018 CHAIN Fall Conferences that identifies barriers to effective communication regarding infections and antimicrobial use during care transitions.
- Poll the Care Transitions Advisory Committee for other sources of information on barriers. Determine gaps in information on barriers and potential strategies for filling those gaps such as in a survey.
- Explore ways that information technology could be utilized to improve communication during care transitions.
- Poll the Advisory Committee and those involved in other care transition improvement initiatives regarding successes in improved communication and compile a summary of the successes.
- Share findings of the HAI/AR Care Transitions Advisory Committee with the Minnesota HAI Prevention Advisory Group at the October 2019 meeting and seek its input for next steps for 2020.

Safe Infection Prevention and Control Practices in Non-regulated Clinical Settings

Statement

The Minnesota Department of Health (MDH) periodically investigates infectious disease outbreaks in clinical settings that are not under any regulatory oversight. These investigations often reveal substandard infection control practices.

Description

Infectious disease outbreaks occurring in non-regulated clinical settings typically come to the attention of MDH when an astute clinician in another setting recognizes a pattern of unusual illnesses in patrons of the non-regulated setting who present to him/her for care. That clinician then notifies MDH. The non-regulated settings have little, if any, incentive to report infections or outbreaks. They may not be aware of infections since their patrons often seek care elsewhere and may not bring the infection to the attention of the provider of non-regulated care. As a result, MDH does not have an accurate assessment of how common infections and outbreaks are in these settings.

Settings that provide services that are not covered by Medicare, Medicaid, or other insurance (e.g., centers devoted to LASIK surgery, cosmetic procedures, or the administration of experimental/non-FDA approved products) and that are not affiliated with health care systems are most likely to have little or no access to infection prevention expertise. Many lapses and breaches in infection prevention can occur as a result, leading to serious infections and outbreaks. These types of settings are becoming more common and some of the services that they offer are invasive (e.g., stem cell joint therapy, 'vampire facials'), creating more opportunities for infections. The public may assume that these settings are under regulatory oversight since similar and sometimes less invasive services (e.g., tattooing) require licensing. Other settings that do not have the benefit of health care regulatory oversight at this time include assisted living facilities, school nurse offices, jails, and correctional facilities.

The MDH Infectious Disease Epidemiology, Prevention and Control (IDEPC) Division does not have regulatory authority. When unsafe practices are found, possible MDH interventions are mostly limited to providing best practice recommendations to the facility/organization and issuing public health notifications via the Health Alert Network (HAN) and/or news media. When licensed health care workers are involved, professional licensing boards are notified, but boards' ability to address situations is often also limited to the conduct and practice of the licensee, not the facility. Other adverse outcomes occur as a result of encounters in these settings, so it is advantageous for IDEPC to work together with other divisions and agencies devoted to patient safety.

Goal

Health care settings (including those providing alternative health care, quasi-health care, and/or invasive procedures) or the services that they provide are regulated or have other measures in place to assure that services are provided safely and that effective infection prevention practices are utilized.

Objectives

- Outline the scope of the problem, current resources, and barriers to ensuring appropriate infection prevention practices in non-regulated clinical settings.
- Identify stakeholders and enlist their input in improvement measures.
- Develop a plan of action and take steps to implement it.

Strategies

- Meet with stakeholders within MDH (Executive Office, Health Policy Division, Health Regulation Division, school health consultant); define scope of problem beyond infection prevention by June 2019.
- Identify and meet with other stakeholders: professional licensing boards, local public health (provides health consultation for jails), Minnesota Department of Corrections, and School Nursing Organization of Minnesota (SNOM); further define scope of problem and explore possible solutions including possible legislation by August 2019.
- Write a white paper based on findings. To be completed by October 2019.
- Share status with advisory group and seek additional input at annual in-person meeting in October 2019.
- Complete modification of this action plan to incorporate concrete steps based on input from stakeholders by January 2020.

Deliverables

Provide recommendations to decision-makers/policy-makers regarding regulatory oversight for health care provided in non-regulated settings.

Appendix A: Background

National scope, epidemiology, and cost

The U.S. Department of Health and Human Services (HHS) established a senior-level Steering Committee for the Prevention of HAIs in 2008 in response to a 1999 Institute of Medicine report that summarized the prevalence and cost of HAIs in terms of dollars and lives lost and a follow-up report revealing that little progress had been made in subsequent years. HHS reported in its action plan that HAIs were a leading cause of death and over one million HAIs occurred across health care annually, creating $28 to $33 billion in potentially preventable health care expenditures. After the steering committee developed its national HAI action plan, HHS provided support for all states to develop their own HAI action plans as part of the American Recovery and Reinvestment Act (ARRA). The national plan was introduced in four phases, with the first phase focusing on acute care hospitals. Phases 2 and 3 focused on non-hospital settings, and Phase 4 was devoted to antimicrobial stewardship. New baselines for tracking progress in preventing HAIs were established based on 2015 NHSN data.

HAI prevention in Minnesota

Prior to 2009, the tracking of HAIs and HAI prevention efforts were fragmented in Minnesota. HAI prevention was not recognized as a public health problem. In 2007, the State Legislature passed a law requiring Minnesota hospitals to report selected HAIs to the Minnesota Hospital Association (MHA) for the purpose of public reporting. One staff person at MDH was designated to address HAI issues, and health care facilities implemented infection prevention programs using tools/partnerships offered by professional organizations and/or non-profit organizations.

ARRA funding from 2009 through 2011 made it possible to establish a state HAI Prevention Advisory Group for MDH, Stratis Health (the Minnesota quality improvement organization), and MHA to work together on two HAI prevention collaboratives: SAFE from CDI and SAFE from Surgical Site Infections (SSI). In 2011, MDH, Stratis Health, MHA, and the Minnesota Chapter of the Association of Professionals in Infection Prevention and Epidemiology (APIC MN) formed the Collaborative HAI Network (CHAIN) to continue to work together and coordinate state HAI prevention efforts. In 2012, MHA received funding to become a hospital engagement network (HEN) through HHS' Partnership for Patients. This HEN subsequently became a hospital improvement innovation network (HIIN).

Beginning in 2011, the Centers for Medicare and Medicaid (CMS) required inpatient prospective payer system (IPPS) hospitals to report selected HAIs to CDC's National Healthcare Safety Network (NHSN) for public reporting on the CMS website, Hospital Compare. This reporting was similar but somewhat different from the state reporting requirements. In 2013, state reporting requirements were changed to align with CMS requirements. In 2014, critical access hospitals were required to report facility-wide catheter-associated urinary tract infections (CAUTI), preferably to NHSN, in order to fulfill the legislative requirement that all hospitals report HAIs. MDH entered a data use agreement with CDC and maintains access to most acute care NHSN data dating back to January 1, 2014. NHSN capacity has expanded to accommodate surveillance in hemodialysis centers, long-term care facilities (LTCFs), and, recently, ambulatory surgery centers (ASCs), but its use is not required in LTCFs or ASCs. Hospitals now also have access to

the NHSN Antimicrobial Use and Resistance (AUR) Module for tracking antimicrobial use and antimicrobial resistance (AMR).

Very limited data were available about the incidence of HAIs in Minnesota health care settings when the program began in 2009. Ten years later, thanks to NHSN and state AMR surveillance, Minnesota has enough data about HAIs in hospitals to track progress in prevention and inform interventions. Data for other health care settings is still quite limited in volume and quality.

MDH's capacity to address HAIs and AR has grown significantly. Currently, there is a team of infection preventionists certified in infection control and epidemiologists who specialize in HAIs and AMR. This team, in collaboration with the medical director, state epidemiologist, and public health laboratory, can respond to day-to-day surveillance and intervention needs in addition to responding promptly and effectively to HAI outbreaks and infection control breaches.

History of the Minnesota HAI Prevention Action Plan

The first Minnesota HAI Prevention Action Plan was written in 2009 at the behest of the U.S. Department of Health and Human Services (HHS). With input from the Minnesota HAI Prevention Advisory Group (HAI AG), it focused on building infrastructure and implementing two HAI prevention initiatives selected based on needs identified by Minnesota infection preventionists. The original focus was primarily on MDH activities and the Action Plan was written following the template provided by CDC.

In 2014, the HAI AG decided that the Action Plan needed updating. After a needs assessment was completed, the HAI AG created an abbreviated action plan, identifying eight areas for focus. The revised 2014-2015 Action Plan was intended to serve as a roadmap for all HAI prevention efforts in Minnesota and to be a living document that could readily be adapted as needed.

CDC required states to update their action plans in 2015, in part to ensure that appropriate steps were in place to address Ebola Virus Disease and other highly pathogenic emerging disease threats. The 2016 Action Plan reflected this and focused primarily on MDH activities. This Action Plan was very lengthy and again utilized CDC's template.

The HAI AG updated the Action Plan in 2018 for 2019 based on available outcome data and a report on prevention activities. The HAI AG members were asked to indicate what they saw as highest priorities to address based on the reports and their individual experiences. MDH consulted the HAI AG subcommittees and other stakeholders for input on objectives and strategies to address these priority needs. The priorities, objectives, and strategies in this plan will be reviewed by the HAI AG in October 2019 to determine what changes are needed for 2020.

Appendix B: Minnesota Healthcare-Associated Infection Prevention Advisory Group

Member Organizations – 2019

Association for Professionals in Infection Control and Epidemiology, Minnesota Chapter (APIC MN)

Consumer representatives – currently vacant

Essentia Health SMDC Microbiology Laboratory

Leading Age Minnesota

Midwest Kidney Network (End Stage Renal Disease Network #11)

Minnesota Alliance for Patient Safety (MAPS)

Minnesota Ambulatory Surgery Center Association (MNASCA)

Minnesota Association of Geriatric Inspired Clinicians (MAGIC)

Minnesota Board of Dentistry

Minnesota Board of Medical Practice

Minnesota Board of Nursing

Minnesota Board of Pharmacy

Minnesota Department of Health:

- Emergency Preparedness and Response Section
- Executive Office (State Epidemiologist)
- Health Policy Division (Adverse Events Reporting)
- Health Regulation Division
- Infectious Disease Epidemiology, Prevention and Control Division
- Office of Health Information Technology
- Public Health Laboratory

Minnesota Directors of Nursing Administration (MN-DONA) – currently vacant

Minnesota Hospital Association

Minnesota Medical Association

Minnesota One Health Antibiotic Stewardship Collaborative (MOHASC)

North Central Chapter of the Infectious Diseases Society of America

Regional Health Coalitions of Minnesota

Stratis Health (QIO)/Lake Superior Quality Innovation Network (QIN)