Intermountain Health

TeleHealth Infectious Diseases and Antimicrobial Stewardship Program

Background and Problem

Infectious disease physicians and pharmacists have advanced training in diagnosing, managing, and treating infections. They also have expertise in hospital epidemiology, preventing hospital-acquired infections, and using the lab to improve patient care. Hospitals and nursing homes that rely on these experts are able to reduce mortality and readmissions, optimize antimicrobial management, and combat multi-drug resistance[1,2]. Unfortunately, many facilities don't have access to infectious disease specialty care and quality antimicrobial stewardship programs, which are required by the Joint Commission and Centers for Medicare and Medicaid Services. As a result, inconsistent antibiotic use may impact patient care and clinical safety measures. Innovative solutions are needed to overcome geographic, economic, and clinical barriers to provide high-quality care and meet regulatory requirements.

Solution

The Intermountain Health Infectious Disease and Antimicrobial Stewardship Program (Tele ID/ASP) has been recognized nationally for filling this gap by partnering with small community hospitals (SCH) and nursing homes (NH) to deliver high-quality care via safe and secure remote technology[3,4]. Comprehensive services include telephone advice available 24/7/365, electronic asynchronous consults, full telemedicine visits via encrypted, two-way audiovisual technology, antimicrobial stewardship program (ASP) support, and a monthly ECHO® telementoring webinar.

The Program's Scope of Services Also Includes:

- Direct to Patient scheduled video visits. This option provides follow-up care for qualifying patients in their home or another non-clinical environment. The service is designed to better meet patient needs and improve post-discharge follow-up. Visits are conducted with approximately one-third of patients who have met with an ID physician while hospitalized.
- Antimicrobial Stewardship Mentorship. TeleHealth ID experts help facility partners establish and maintain robust ASPs that improve patient safety and outcomes, decrease rates of *C. difficile* and multi-drug resistant infections, and reduce costs.
- Monthly ECHO® Mentoring Program. This monthly interactive tele-mentoring webinar reviews common ID conditions and stewardship topics, current guidelines and literature, quality improvement projects and best practices, along with case discussions and care management analysis.

Program Growth

Since program inception in 2016, the Intermountain Health Tele ID/ASP Program has grown to provide ID consultation and stewardship support to more than 25 facilities throughout the Intermountain West:

- Over 6,000 interactions with partner facilities including phone calls, eConsults, and telemedicine consults.
- ID Pharmacist review and interventions to improve antimicrobial management, including discontinuation of unnecessary antibiotics, resolving drug-bug mismatches, and narrowing broad-

spectrum antibiotics.

- Established and optimized local antimicrobial stewardship programs at 19 facilities.
- Provided comprehensive education and resources for frontline clinicians
  - Guidelines, protocols, order sets, and best-practice recommendations for specific infections
  - Templates, guidance, and mentorship for quality improvement projects
- Tracked, reported, and shared system data
  - Improved awareness of antibiotic usage and prescribing patterns
  - Established facility benchmarking and identified outliers/areas for improvement

Results and Clinical Benefits

Facilities that partner with the Intermountain Health Tele ID/ASP have improved care, outcomes, and reduced healthcare costs:

- Tele ID/ASP intervention improved quality of care, reduced readmissions, and reduced mortality for patients with Staphylococcus aureus bacteremia (SAB)
- Avoided over 5,000 days of unnecessary antibiotics in patients hospitalized with COVID-19
- Identified more than 2,500 days of unnecessary antibiotics for urinary tract infection in the ED
- Implemented rapid diagnostics protocol for bacteremia leading to shorter lengths of stay
- Completed more than 15 regulatory surveys without any antimicrobial stewardship findings
- Significantly decreased unnecessary antibiotic use at critical access hospitals (See Appendix)

Originating Site Economic Benefits

In small community hospitals and nursing homes located far from major population centers, it is expensive and difficult, if not impossible, to hire physicians with ID training. Telehealth is an effective way to contract for specialized services without hiring full-time ID physicians. Revenue retained from patients managed at the local facility may come from labs, imaging, procedures, and appropriate antibiotic medications. Appropriate use of antibiotics improves patient outcomes, reduces antibiotic resistance, decreases costs associated with prolonged use, and helps prevent adverse events for hospitalized patients[7].

A recent systematic review found that hospitals with an ASP save an average of $435,000 (range: $9,110–$2.06 million) per year, or $732 (range: $2.50 -$2,640) per patient[8]. Cost-reduction benefits included direct antibiotic costs, indirect costs, decreased length of stay, decreased readmissions, and more. Cost savings associated with ASPs have been demonstrated in long-term care facilities as well. One study conducted in a 60-bed urban long-term care facility found that weekly AS interventions resulted in a 21 percent reduction in antibiotic use and a 28 percent reduction in cost per patient day[9].

Patient and Community Benefits

Patients and their families prefer high-quality healthcare that is both affordable and close to home. Healthcare costs are lower when patients receive care locally and avoid care in larger centers[10]. Families and loved ones avoid costs associated with travel, such as mileage, lodging, meals, and lost wages. Community benefits consist of increased access to healthcare services, retention of jobs and wages, and decreased CO2 emissions from travel. Partnering with Intermountain Health, an organization globally recognized for its excellence in healthcare, signals a strong commitment to delivering top-notch medical services to local providers, patients, and the broader community. This partnership not only enhances healthcare access but also bolsters the reputation and financial stability of local healthcare institutions.

Collaboration with Local Teams

The ID specialty is well suited for telehealth given the cognitive nature of the discipline, reliance on a detailed history, review of the medical record, and, when necessary, interactive patient consultation via a synchronous, secure audio-video connection. With the support of ID and ASP services, local clinical staff have an added layer of reassurance that their interventions and treatments are comparable to an in-

person ID consult.
Sustainable ID and ASPs require coordination and commitment from on-site administrators and the entire local clinical team. The Intermountain Telehealth team collaborates with the local team to preserve existing relationships among primary care providers and patients. Intermountain's multidisciplinary ID team partners with local primary care, pharmacy, infection prevention, and laboratory staff to provide guideline-concordant ID care, whether the patient is seen in-person or via telehealth technologies.

About Intermountain Health

Intermountain Health is a team of nearly 60,000 caregivers who serve the healthcare needs of people across the Intermountain West, primarily in Utah, Idaho, Nevada, Colorado, Montana, Wyoming, and Kansas. We are an integrated, non-profit health system based in Salt Lake City, with clinics, a medical group, affiliate networks, hospitals, homecare, telehealth, health insurance plans, and other services, along with wholly owned subsidiaries including SelectHealth, Saltzer Health, Castell, Tellica, and Classic Air Medical.

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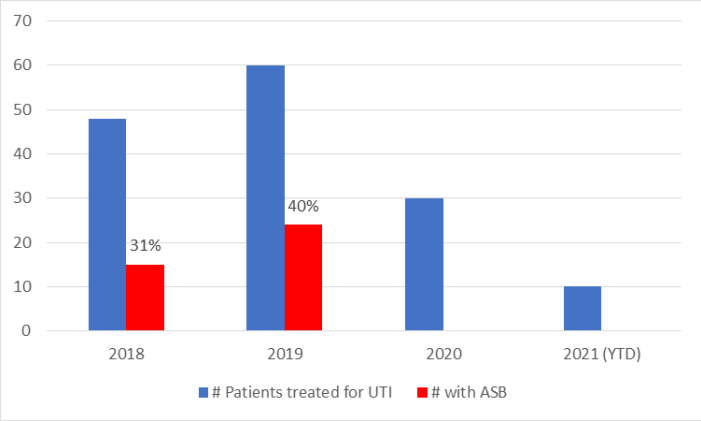
Appendix: Intermountain TeleHealth Antimicrobial Stewardship Interventions in Critical Access Hospitals

Here are three examples of impactful, sustainable quality improvement projects implemented at critical access hospitals that have partnered with the Intermountain Telehealth ASP program:

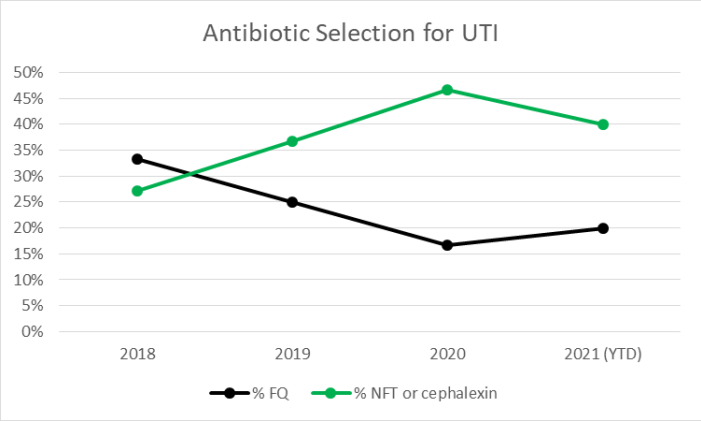
1. Improved management of UTI and Asymptomatic Bacteriuria (ASB) at a Critical Access Hospital

A rural 10-bed hospital partnered with the Intermountain Telehealth AS program to identify inappropriate prescribing for UTI and ASB in its hospital, ED, and clinics. Medical records were reviewed for patients prescribed antibiotics for UTI. Data was collected on a quarterly basis regarding the diagnosis, presence or absence of UTI symptoms, antibiotic selection, and duration of treatment. Baseline data (2018/2019) along with best-practice recommendations were shared with local prescribers leading to significant improvements in antibiotic prescribing (2020/2021).

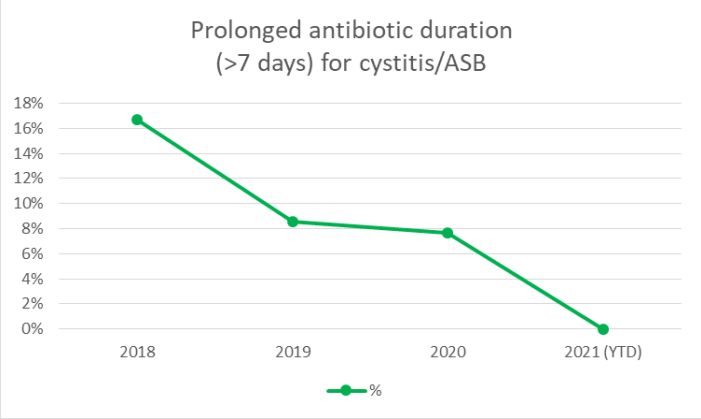
Reduced number of patients treated unnecessarily for ASB.



Improved antibiotic selection for treatment of UTI and reduced fluoroquinolone exposure.



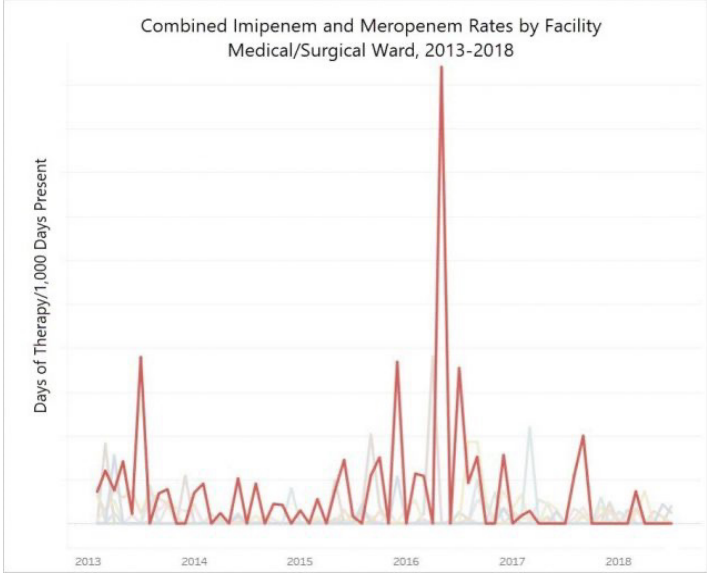
Reduced prolonged antibiotic durations for cystitis, reducing unnecessary exposure and improving adherence to national best-practices.



2. Using Telehealth to Decrease Carbapenem Use in a Critical Access Hospital

(Summarized from the CDC website: https://www.cdc.gov/nhsn/au-case-examples/reducing-carbapenem-use.html)

Using data from the CDC's National Healthcare Safety Network, the Intermountain Telehealth AS program identified a rural 20-bed hospital as an excessive user of carbapenems (imipenem and meropenem) compared to similar critical access hospitals. An ID telehealth pharmacist defined appropriateness criteria for carbapenem use, and empiric therapy was noted as a primary driver of inappropriate usage. The antibiogram was shared with prescribers to educate them on local resistance patterns and to help guide their prescribing of narrower spectrum empiric antimicrobial therapy. The pharmacist also began prospectively reviewing and intervening on meropenem orders, leading to a significant reduction in carbapenem use.



3. Fluoroquinolone Evaluation in a Critical Access Hospital

Through the CDC's National Healthcare Safety Network data analysis, the Intermountain Telehealth AS program pinpointed a rural 20-bed hospital as using fluoroquinolones more than other similar hospitals. A pharmacist, working remotely, established criteria for when these antibiotics are appropriate, focusing on common conditions like pneumonia and urinary tract infections.

An examination of the hospital's antibiotic use revealed that up to 25% of fluoroquinolone prescriptions were unnecessary, amounting to over 100 days of unneeded antibiotic use in just six months. To address this, the pharmacist shared data on antibiotic use with the hospital's doctors, along with recommendations for prescribing based on medical evidence.

This initiative led to a notable decrease in the use of fluoroquinolones. Reducing the usage of these antibiotics is crucial because their overuse can lead to resistance, making infections harder to treat, besides increasing healthcare costs and potentially harming patient safety.