

***Infectious Diseases Telehealth  
and  
Tele-Antimicrobial Stewardship Program***

# Intermountain Healthcare

## Profile

**Intermountain Healthcare** is an internationally recognized, integrated, not-for-profit health system based in Salt Lake City, Utah, (USA) with 33 Hospitals, (includes „virtual“ hospital), 385 Ambulatory Care Centers (clinics), approximately 3,900 employed physicians and advanced practice providers, and a health insurance company, Select Health, which covers more than 1.2 million lives. Intermountain is widely recognized as one of the premier healthcare systems in the United States and as a leader in transforming healthcare through high-quality clinical outcomes and efficient healthcare delivery at a sustainable cost.

Intermountain is the largest healthcare provider in the Intermountain West with more than 60,000 caregivers (employees) serve communities in seven US primary states: *Utah, Idaho, Nevada, Colorado, Wyoming, Montana, and Kansas*, and also regularly treat patients from other parts of the Intermountain West. In addition to the services and care it offers in its physical facilities, Intermountain Healthcare also provides extensive telehealth services with over 35 telehealth programs in the western United States, further enhancing Intermountain Healthcare’s ability to provide quality-based medical care to patients across its vast geography. Intermountain has been delivering on its mission of helping people live the healthiest lives possible.

Intermountain Healthcare is the **first healthcare system in the world** to earn “**Triple Stage 7 Organization**” status by adding HIMSS’ new EMRAM22 **Aspirational Maturity Model Standard** requirements to their O-EMRAM and AMAM Stage 7 achievements, for care facilities located in Utah & Idaho.

Intermountain’s quest for better health and high-quality care at more affordable costs is the driving force behind Intermountain’s commitment to truly transform healthcare across the country. Intermountain Healthcare is uniquely positioned in the nation to provide technological advancements and innovative solutions that help meet the demand for high quality care at a sustainable cost with a long history of excellence in healthcare technology & innovation, development and to find solutions that help patients and those who provide care and to improve care and outcomes for patients.

**Date Stage 7 was achieved: March 1, 2022**

## The Challenge

Background for Infectious Diseases (ID) and Antimicrobial Stewardship (AS) TELEHEALTH program:

- Infections are common across all healthcare settings and associated with significant morbidity, mortality, and healthcare costs, particularly if not managed in a clinically appropriate manner.
- Much of the antibiotic use (worldwide and particularly so in the United States) to treat these infections is either unnecessary or inappropriate; Studies consistently show up to 50% of antibiotic use in the inpatient and outpatient clinical settings, and up to 75% in long-term care settings, are not necessary.
  - Each day of antibiotic therapy can increase risk of harm to patients!!
  - ID/Antimicrobial Stewardship intervention is urgently needed to decrease widespread harm and to improve quality outcomes.

- Accessing these vital resources is challenging in resource-limited settings like small, rural, and critical access hospitals.
  - Telehealth has emerged as a novel ASP strategy to improve access remotely for geographically isolated areas, but best practices have not been defined.
  - Intermountain Healthcare performed a randomized trial to help answer this question in 2014/15: Looking at how best to do stewardship in smaller community/rural hospitals, the study (SCORE) found that these facilities needed access to a robust integrated infectious disease consult and antimicrobial stewardship services.
  - Our integrated ID Tele/ASP program was implemented in October 2016.

#### ID/AS TeleHealth Program Goals and Objectives:

- Optimal management (including diagnosis and treatment) of infectious diseases, providing subspecialty care for patients close to their home in local communities across the state and region.
- Education and empowerment of local clinicians to provide optimal care for patient's w/ ID conditions.
- Judicious use of antimicrobial agents to optimize patient outcomes, avoid harm, decrease healthcare associated costs, and avoid development of resistant bacteria.

## Implementation Overview

The program was implemented in a phased approach from 2016-2017 with all Intermountain facilities “live” by January 1, 2017.

*For a detailed description of the program implementation, see our manuscript that was published in Open Forum Infectious Diseases for [pubmed.ncbi.nlm.nih.gov/34141816/](https://pubmed.ncbi.nlm.nih.gov/34141816/)*

## Key participants involved in the process:

- Todd Vento, MD, Infectious Disease & Assoc. Medical Director, Teleservices.
- John Veillette, Clinical Pharmacist
- Stephanie May, Clinical Pharmacist
- Eddie Stenehjem, MD, Senior Medical Director Medical Specialties
- Farukh Usmani, MD, MS, Medical Director, Digital Technology Services.

The larger team comprised of Tele-ID physicians and pharmacists, Intermountain Tele-Health Leadership, Operations directors, CTIS/DTS and IT leadership and teams, frontline Small Community Hospital care providers, and on-site program coordinators.

## Resulting Value / ROI

- Significant (clinical and statistical) decreases in 30- and 90-day mortality for patients with *Staphylococcus aureus* bacteremia (SAB) following intervention by the ID Telehealth physicians and pharmacists. (NOTE: SAB is one of the most common ID conditions that ID physicians consult on, and many rural and community health system providers do not have as much experience with the comprehensive management required of this condition.)
- High provider (SCH clinicians, pharmacists, administrators) and patient satisfaction scores (>99%)
- Significantly improved appropriate use of antibiotics targeted with quality improvement projects
- Avoided >3,600 unnecessary antibiotic days for patients with COVID-19.
- Decreased unnecessary meropenem and fluoroquinolone usage at critical access hospitals (which are high cost antibiotics with significant potential for formation of bacterial resistance and severe adverse effects such as medication interactions, antibiotic associated diarrhea and *C. difficile* infections)
- Identified more than 2,500 days of unnecessary antibiotics for urinary tract infection in the SCH Emergency Departments (EDs)
- Implemented large-scale education and performance-improvement program
- Implemented rapid diagnostics protocol for bacteremia leading to shorter hospital length of stay (LOS)
- Facilitated more than 1200 ID consultations for patients with previously unrecognized indications
- Using CTIS/Telehealth data analysts and structured clinical note tracking, identified trends in type of ID consultation needs, and accurate and timely awareness of telehealth work (2-way AV consultations, electronic consultations, telephone consultations) and resulting ID Telehealth staff increases to better meet the clinical care needs of SCH providers, leadership, and patients.
- Completed more than 10 regulatory surveys without any antimicrobial stewardship findings or penalties
- Achieved more than \$500,000 in cost avoidance in 2021 through ID pharmacist interventions
- Tracked and reported system data, which:
  - Improved awareness of antibiotic usage and prescribing patterns
  - Established facility benchmarking
  - Identified areas for improvement
  - Updated antibiogram for clinical decision making
- Implemented an integrated, ECHO® monthly program, with an annual increase in attendance by SCH care providers of >50%.
- Presented program findings/accomplishments at 4 International and National conferences, on national Population Health Podcasts, on CDC monthly national clinician education series, as well as multiple media outlets to include: Modern Healthcare, Wall Street Journal, CIO Review, Startup City, among several others.

- Identified as one of three model integrated ID/AS telehealth programs by the Infectious Diseases Society of America (2018) [idsa.confex.com/idsa/2018/webprogram/Paper68406.html](https://idsa.confex.com/idsa/2018/webprogram/Paper68406.html)
- Work also led to invitation to help with National Policy statement for IDSA and the HIV Medical Association (HIVMA) on advancing digital equity. [pubmed.ncbi.nlm.nih.gov/33033829/](https://pubmed.ncbi.nlm.nih.gov/33033829/)
- Invited to present findings/program experience to session of Congress, highlighting the Intermountain Healthcare ID/AS Telehealth program successes and how they support continued funding and expanded medical coding/billing regulations to support the use of telehealth delivery during the COVID-19 pandemic. Our high patient satisfaction in an elderly patient population data (documented w/ help of CTIS/telehealth data analysts, using structured EMR telehealth template review) was key to highlight the acceptance and desire for Medicare patients to use and benefit from digital/remote care.  
[connectwithcare.org/wp-content/uploads/2020/04/Alliance-Connected-Care-COVID-19.pdf](https://connectwithcare.org/wp-content/uploads/2020/04/Alliance-Connected-Care-COVID-19.pdf)  
[www.modernhealthcare.com/opinion-editorial/congress-must-act-ensure-telehealth-can-be-used-combat-coronavirus](https://www.modernhealthcare.com/opinion-editorial/congress-must-act-ensure-telehealth-can-be-used-combat-coronavirus)
- Strong relationships are key to success
  - Local empowerment of care providers, with remote centralized expertise, data, and resources.
  - Leveraging the EMR to capture antibiotic use practices and ID condition management practices provided readily identifiable areas to address for Performance/Quality Improvement and areas for more rigorous clinical research.
  - Dedicated telehealth IT/data support personnel, working closely with individual telehealth clinical specialty/program leaders, are essential for providing accurate outcome (clinical and administrative) data that are vital to program evaluation, improvement, funding, and expansion.
- A well-integrated model with dedicated ID physicians and ID pharmacists acting jointly in individual patient cases and on long term population health/quality improvement programs is feasible and effective. Key components are:
  - Tele-ASP surveillance/longitudinal support
  - Structured clinical note templates and accessible demographic and clinical information
  - Timely CTIS/IT Telehealth data analyst support
- Program implementation processes and outcomes data should be shared broadly and can significantly affect not only other healthcare systems and their patient populations, but also promote national-level changes in healthcare policy, funding, legislation. In order to do this effectively, an integrated digital care clinical and information systems team is essential. Program findings/ challenges/successes must be shared.

QUOTE FROM ORGANIZATION EXECUTIVE:



***An integrated ID/AS Telehealth team that is centrally supported by clinical and digital care experts, using centralized data surveillance, monitoring and clinical outcome data, has maximized our ability to provide timely, vital ID care to a much larger population of healthcare providers and their patients, while eliminating the healthcare access inequities associated with rural and small communities in our region.***

ONE SENTENCE THAT ENCAPSULATES THE EXPERIENCE AS A WHOLE:

**This program demonstrates the importance of closely integrating individuals and processes across clinical and information system/digital care disciplines to provide the highest quality subspecialty care to our geographically disadvantaged communities, care providers, and individuals.**

**For questions, contact:**

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Medical Director Care Transformation

Intermountain Healthcare

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## Additional References:

- [patient-monitoring.cioreview.com/cxoinsight/sharing-expertise-through-telemedicine-nid-25124-cid-178.html](https://patient-monitoring.cioreview.com/cxoinsight/sharing-expertise-through-telemedicine-nid-25124-cid-178.html)
- [www.modernhealthcare.com/opinion-editorial/congress-must-act-ensure-telehealth-can-be-used-combat-coronavirus](https://www.modernhealthcare.com/opinion-editorial/congress-must-act-ensure-telehealth-can-be-used-combat-coronavirus)
- [healthcare.startupcity.com/startup-insider/sharing-expertise-through-telemedicine-nwid-41.html?utm\\_source=google&utm\\_campaign=startupcity\\_topslider](https://healthcare.startupcity.com/startup-insider/sharing-expertise-through-telemedicine-nwid-41.html?utm_source=google&utm_campaign=startupcity_topslider)
- [www.accountablehealthllc.com/todd-vento-md-mph-medical-director-of-intermountain-connect-specialty-care/](https://www.accountablehealthllc.com/todd-vento-md-mph-medical-director-of-intermountain-connect-specialty-care/)



Intermountain Healthcare 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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