



# Clinical Programs *Accomplishments Report*



Bentley McEntire, M.D.  
HOSPITALIST





## Introduction

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This Clinical Programs Accomplishments Report is an introduction to Intermountain Healthcare's 10 Clinical Programs, including a brief history, the programs' infrastructure, and their essential purpose in the organization. The report highlights the recent work and accomplishments of the thousands of professionals connected to the programs, including the leaders who oversee and guide the work; the development teams who collaborate to identify and develop evidence-based practices; and the caregivers who apply the work to provide Intermountain's patients the right care, at the right time, every time. It takes every person, fulfilling their vital roles, to make these achievements possible.



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## Intermountain Healthcare's Clinical Programs:

*Our primary mechanism to  
advance clinical care in a  
consistent way across our  
healthcare system*

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Did you know Intermountain Healthcare's mortality rates for patients who suffer a heart attack are among the lowest in the nation? Have you heard that through Intermountain's Precision Genomics program, we can identify actionable gene mutations in more than 75 percent of patients with advanced-stage cancer and offer those patients additional treatment options? As an organization, we celebrate these advancements in medicine, and dozens more, because of the lives that are improved and saved as the result of critical work that goes on behind the scenes through Intermountain Healthcare's Clinical Programs.



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IN EACH CLINICAL PROGRAM, MULTIDISCIPLINARY DEVELOPMENT TEAMS  
WORK TOGETHER TO REVIEW MEDICAL LITERATURE, EVALUATE CLINICAL PROCESSES AND DATA,  
AND DEVELOP EVIDENCE-BASED BEST PRACTICES.

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# Intermountain's 10 Clinical Programs *and their infrastructure facilitate collaboration*

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Intermountain's Clinical Programs bring people together to continually improve care. The programs are the mechanism by which our experts in medical science, operations, data analysis, and care delivery collaborate and advance clinical care. Each program is led by a physician Medical Director and an Operations Director. They oversee the work of the Clinical Programs and lead the programs' guidance councils with participation from each region in the form of regional management teams. In each program, multidisciplinary development teams work

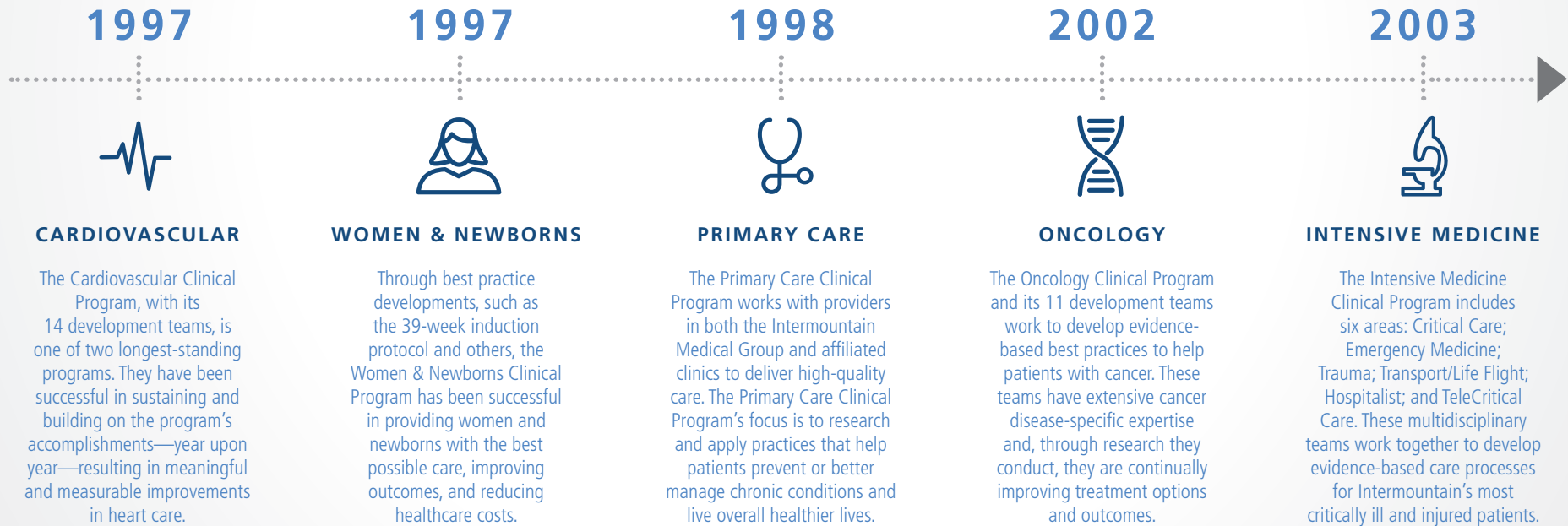
together to review the medical literature, evaluate our own processes and data, and develop evidence-based best practices. Our caregivers then apply these standards, using judgment and flexibility, to tailor care to meet the unique circumstances of each patient. Notably, this approach leads to both demonstrably improved outcomes and more affordable healthcare. Why? Because when care is provided in the best possible way, there are fewer medical complications, patients recover more quickly and completely, and costs tend to be lower.

## **INTERMOUNTAIN HAS 10 CLINICAL PROGRAMS:**

*Behavioral Health, Cardiovascular, Intensive Medicine, Musculoskeletal, Neurosciences, Oncology, Pediatric Specialties, Primary Care, Surgical Services, and Women & Newborns.*

# Since 1997, Intermountain's Clinical Programs *have evolved and grown in their function and influence*

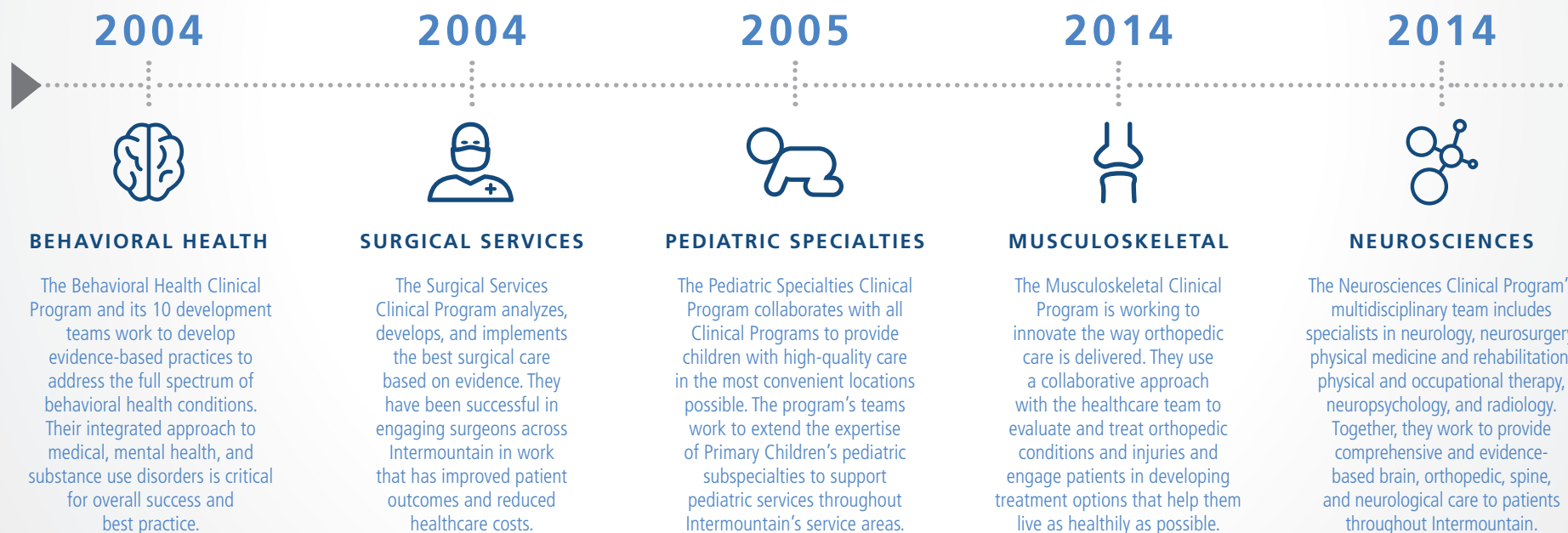
The introduction of Clinical Programs in 1997 is an important marker on Intermountain's historical timeline. Cardiovascular and Women & Newborns were Intermountain's first two Clinical Programs. In 2014, the addition of Musculoskeletal and Neurosciences brought the number of Clinical Programs to 10.



In the late '90s, Clinical Program teams had two basic responsibilities: to set clinical improvement goals and lead system efforts to accomplish those goals. Their roles evolved from there. Today, our entire organization looks to our Clinical Programs for not only their teams' knowledge and expertise in identifying, developing, and deploying best practice protocols, but also in guiding Intermountain to:

- Set clinical improvement goals and lead system efforts to accomplish those goals

- Consult on clinical staffing models
- Comply with regulatory standards
- Lead system-wide equipment and supply purchases
- Oversee compliance to Medicare medical necessity requirements
- Develop physician pay-for-performance metrics
- Create clinical content for iCentra
- Educate and train clinicians about regulatory requirements
- Support coding and documentation efforts for public quality reporting







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DEVELOPMENT TEAMS WITHIN INTERMOUNTAIN'S CLINICAL PROGRAMS FOCUS THEIR WORK ON A CONTINUUM OF CARE, A CONCEPT THAT INVOLVES GUIDING AND HELPING PEOPLE TO OPTIMIZE THEIR HEALTH THROUGHOUT THEIR LIFETIME AS WELL AS PROVIDING TREATMENT WHEN A PERSON BECOMES A PATIENT IN A CLINIC OR HOSPITAL. THIS WORK IS CENTRAL TO INTERMOUNTAIN'S MISSION OF *Helping People Live the Healthiest Lives Possible*®.

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# Clinical Programs are central to Intermountain's Mission and Vision

Intermountain's Vision is to be a model health system by providing extraordinary care and superior service at an affordable cost. This aspirational commitment began in 1975 when Intermountain Healthcare was established and will continue as we learn and discover new and better ways to provide care. Our Clinical Programs are at the heart of this effort. These programs help Intermountain optimize quality, and they are key to our financial sustainability and ability to offer affordable care.

Our Mission is *helping people live the healthiest lives possible*®, a lifelong pursuit. Our Clinical Programs focus their work on a continuum of care, a concept that involves guiding and helping people to optimize their health throughout their lifetime as well as providing excellent treatment based on evidence when a person becomes a patient in a clinic or hospital.

All Clinical Programs are focused on a *continuum of care*.





## The Heart Failure Pathway *improves outcomes, reduces readmissions for high-risk patients*

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Heart failure affects 6 million people in the U.S., and although they represent just over 2 percent of the total population, heart failure is the number one cause for hospitalization for people over 65. While treatments are helping people with heart failure live longer, the overall prevalence of heart failure has increased along with incidence of hospital readmissions and mortality.

Since 2014, the Cardiovascular Clinical Program team has focused its efforts on reducing the incidence of heart failure and improving outcomes for high-risk patients, including reducing hospital readmissions and mortality. McKay-Dee Hospital piloted the Heart Failure Pathway for high-risk patients in 2014, and their weekly collaboration and feedback helped shape and ready the program for enterprise-wide implementation. Five Intermountain hospitals began using the pathway in 2015, with the remaining 17 following in 2016.

The Heart Failure Pathway is the structure around a comprehensive set of processes and decisions, developed by our clinicians, to treat patients at risk for heart failure. Here's how it works: Multidisciplinary teams of doctors, case managers, nurses, dietitians, and pharmacists review a home-grown and validated daily report to accurately identify patients who are at high risk for heart failure, hospital readmission, and mortality. This information helps the teams intervene in a timelier manner and leads to improved outcomes. The teams then deploy a set of best-practice processes and decisions to treat patients according to their specific needs in the continuum of care.

One overarching entity guides the work and measures the progress of the Heart Failure Pathway, but the bulk of the work is accomplished by the teams actually rendering the care using the tools and resources developed by the Clinical Program. And because the work is coordinated throughout all of Intermountain, our patients at high risk for heart failure receive the same high standard of care at every Intermountain hospital. "We're successful because of our interdisciplinary approach," said Colleen Roberts, the program's Operations Director. "Everyone is at the table and involved from the beginning."



In 2014 when McKay-Dee Hospital piloted the pathway,

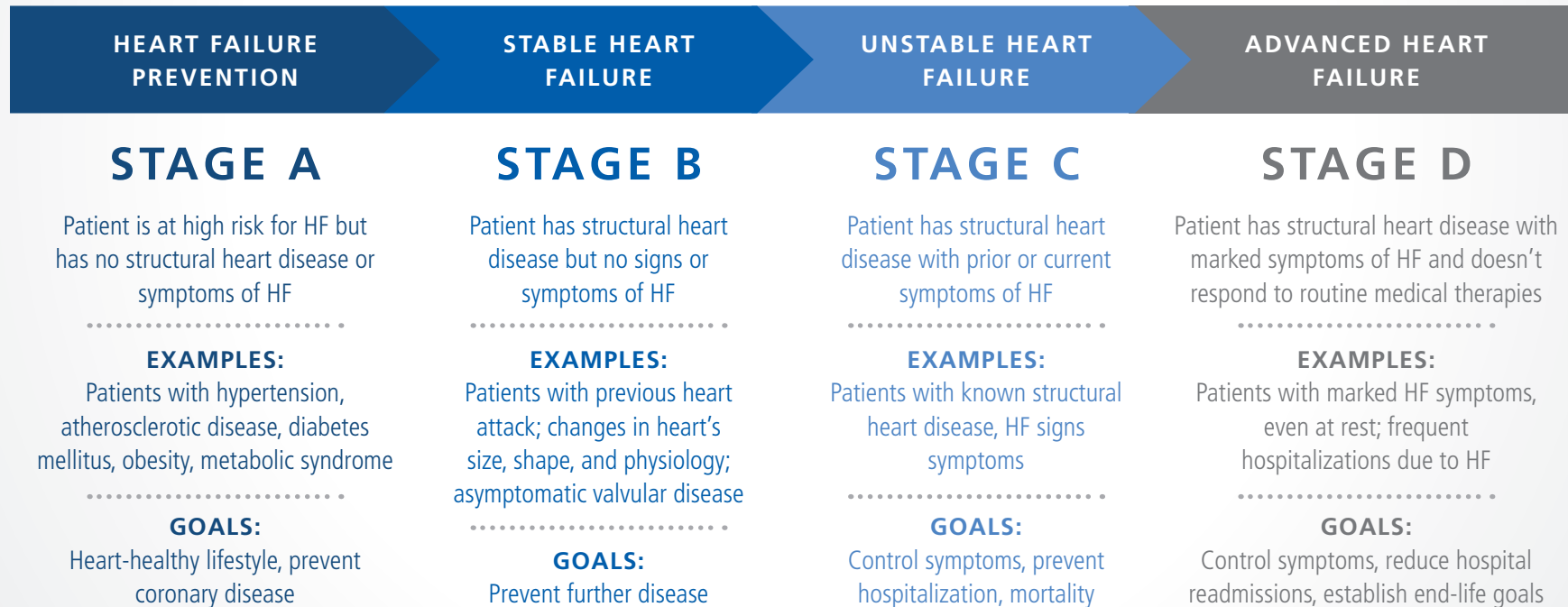
**MORTALITY RATES FOR PATIENTS PARTICIPATING IN THE PILOT WERE  
7% COMPARED TO 19% FOR PATIENTS NOT PARTICIPATING.**

The percent of patients who were able to return home after hospital discharge and continue care with homecare services as opposed to going to a skilled nursing facility was 34% for those in the pilot compared to 19% for those not in the pilot.

## STAGES OF HEART FAILURE (HF)

The table below outlines the stages of heart failure. In a collaborative effort between patients and their care providers, we want to do everything possible to help patients be at their healthiest and slow the progression of heart failure. This is why our Cardiovascular Clinical Program is working hand-in-hand with the Primary Care Clinical Program to identify risk factors like high blood pressure and lipid

levels, so the work begins before our patients enter our hospitals and doesn't end when they leave our hospitals. In the near future, we'll be expanding the resources available for our patients by connecting them to community support groups where they will be able to speak with and learn from others who are living with the same diagnosis and dealing with the same challenges.





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THE CARDIOVASCULAR CLINICAL PROGRAM COLLABORATED WITH INTERDISCIPLINARY TEAMS TO IDENTIFY AND IMPLEMENT ONE SUPPORT SYSTEM, CARDIOHELP®, TO PROVIDE THE BEST CARE AS QUICKLY AS POSSIBLE FOR PATIENTS EXPERIENCING LIFE-THREATENING HEART CONDITIONS.

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# Interdisciplinary teams research and implement solutions *that improve care and save lives*

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Cardiogenic shock is a life-threatening condition in which the lungs cannot oxygenate the blood adequately nor can the heart pump enough blood to sustain life. It's a dangerous complication with high mortality in patients experiencing a massive heart attack. Devices that work to temporarily perform the function of the heart and lungs are called cardiopulmonary support systems. Often, to be effective, they must be connected to a patient quickly and by an experienced team.

Throughout Intermountain, we treat up to 700 patients with the diagnosis of cardiogenic shock annually. In the past, some of these patients with irreversible cardiogenic shock were treated at our four hub hospitals by the cardiovascular team with five different support system devices. This meant

that if a patient connected to one device was transferred to a hospital using a different device, that hospital's team would have to splice together the two devices or remove and change over to an entirely different device.

The Cardiovascular Clinical Program collaborated with interdisciplinary teams at these hospitals to identify and implement one support system, CardioHelp®, to provide the best care as quickly as possible for these critical patients. CardioHelp® is portable, effective, and designed for rapid initiation. Moreover, all cardiovascular care team members in the four hospitals are experienced in using this device, which when coupled with rapid initiation, increases the patient's likelihood to survive and recover from such a life-threatening condition.

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## ANDREA DUNCAN'S STORY

Andrea Duncan is a young mom. She had a week-old baby, had spent an enjoyable afternoon with her sister, and had just laid down for a nap. She woke up, having difficulty breathing and heaviness in her chest. Andrea was having a heart attack. Her sister, still with her, called 911. The expertise and quick responses from critical care teams at two Intermountain hospitals and the Life Flight crew, along with the assistance of the CardioHelp® cardiopulmonary support device, kept her alive until she was able to receive a heart transplant. Andrea made a full recovery.

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Moms and babies benefit physically and emotionally  
*through the practice of skin-to-skin contact during the first hours after childbirth and beyond*

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“Recent research has shown that the first hours after childbirth are unparalleled for bonding between mother and baby,” said Dr. Ware Branch, Women & Newborns Clinical Program Medical Director.

Skin-to-skin contact is the practice of placing a stable newborn baby upright and chest down on the bare chest of their mother. Ideally, when done in the first hour after birth, a baby transitions better to being outside of the mother’s womb. Being skin-to-skin with their mothers, babies begin life with greater respiratory and temperature stability, as well as stay calmer and cry less, and the benefits extend to mothers as well. Many studies have shown that moms who have early skin-to-skin contact have increased maternal behaviors and higher rates of successful breastfeeding.

*Stephanie Partridge, mother of five from Cedar Hills, Utah. Read her story on page 18.*



Mothers and babies can now experience  
the same health benefits  
*from skin-to-skin contact following Cesarean births*

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For many years, mothers giving birth at Intermountain hospitals have reaped the benefits of skin-to-skin contact for themselves and their babies following normal vaginal births. In 2015, teams within the Women & Newborns Clinical Program worked together to implement this best-practice protocol in operating rooms across Intermountain hospitals, extending the health and bonding opportunities of skin-to-skin contact to stable moms and babies following Cesarean deliveries.

Through the Clinical Program's work, each member of the operating room became educated as to the benefits of skin-to-skin contact, and therefore, supported the necessary modifications to make this experience possible for patients. Across Intermountain, the number of mothers and babies participating in skin-to-skin contact following both vaginal and Cesarean deliveries has increased, which means more patients are reaping the benefits of the practice too.

## STEPHANIE'S STORY

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"I consider it a day of miracles," Stephanie Partridge, a 33-year-old mother of five in Cedar Hills, Utah, said of the birth of her youngest son, Brett.

Just weeks into her fifth pregnancy, Stephanie discovered a lump in her breast. She discussed her concern with her doctor, thinking she had a clogged lactation duct. Tests revealed breast cancer.

"It took a few weeks to take everything in and to accept the fact that I have cancer and I'm pregnant, and now I just need to move forward."

"Here she was fighting for her life and her baby's life," Michelle Wilcox, American Fork Hospital labor and delivery nurse, said about Stephanie.

When the day came, Michelle sat down with Stephanie and her husband to discuss the C-section delivery. Stephanie's first four children were delivered via C-section, but baby Brett would be the first of her children she'd be able to hold immediately after delivery.

"Skin-to-skin contact has become best practice at Intermountain because we've seen how the babies respond and the mothers respond," Michelle said. "If it's the right thing to do in a vaginal delivery, it's probably the right thing to do in a C-section."

"Just after [Brett] was born, I heard him cry and just seconds later, he was on my chest, and I could feel his face touching me," Stephanie recalls. "I could feel him breathe—an opportunity I hadn't had with my other babies right after they were born. It was perfect."

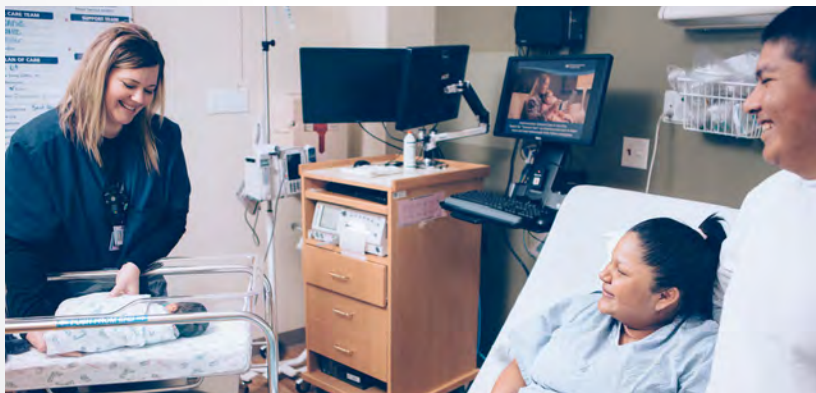


# Using TeleHealth *to improve outcomes for newborns*

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The Women & Newborns Clinical Program made significant strides in using TeleHealth technology to rapidly treat newborn babies. TeleHealth, which consists of using audio and video resources to link people at different locations, is being used to assist clinicians when conducting consultations and aid in the resuscitation of infants in respiratory distress.

Approximately 1 to 2 percent of babies born at Intermountain facilities require extended resuscitations after birth. TeleHealth helps clinicians connect and ensure best practices are followed when clinicians at rural hospitals encounter these high-risk, low-frequency events.



Direct benefits of using TeleHealth in a neonatal setting include:

- Better stabilization of newborns, resulting in improved outcomes
- Reductions in unnecessary patient transfers to larger facilities when care can be given on-site with TeleHealth assistance
- Reduced costs to patients by avoiding complications inherent with respiratory distress

While these benefits are noteworthy, the secondary benefits of using TeleHealth to deliver care can't be underestimated:

- Improved communication and relationship-building between Level III nurseries and rural hospitals
- Promoting better consistency and training by sharing best practices more effectively across regions
- Improvements in both confidence and competencies during a newborn resuscitation, which for our rural hospitals is a high-risk, low-frequency event

# Feeding preterm infants based on cues *fosters early positive eating experiences and decreases hospital stays*

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Premature infants are at high risk for feeding problems, the leading cause for readmission once they're discharged from the hospital. Feeding skills are developed during a period of rapid brain development after a baby is born. However, repeated negative experiences during initial feeding could lead to reluctance to acquire this essential skill. Clinicians have historically fed premature infants according to a schedule with a set feeding volume and time. Often, this method ultimately required using a feeding tube.

Intermountain's Women & Newborns Clinical Program NICU Development Team lead the research and development of an infant-driven, cue-based feeding system that allows nursing staff to increase feeding opportunities using readiness cues from the baby. They chose to follow

a modified Ludwig infant feeding scale to standardize communication about feeding readiness, feeding quality, and parent education. The new program also helped them standardize their approach to infant feeding cues and supportive feeding strategies; decrease length of stay; and improve parent satisfaction.

Cue-based feeding was launched at Utah Valley Hospital and resulted in a significant decrease in length of stay at all gestational ages. Cue-based feeding was rolled out system-wide in July 2015 in newborn, special care, and intensive care nurseries. Since a wider implementation of cue-based feeding, similar findings were achieved at other facilities. Notably, Intermountain Medical Center saw a significant decrease in length of stay for extremely low birth-weight infants.

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## **PRETERM INFANT CUE-BASED FEEDING IMPLEMENTATION RESULTS:**

*Median length of stay for 24-week gestation infants decreased from 129 days to 102 days, while median length of stay for 25-week gestation infants decreased from 121 days to 79.5 days.*



## The Diabetes Prevention Program offers healthy pathways *to prevent or delay the onset of type 2 diabetes*

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It is estimated that 29.1 million Americans are diagnosed with diabetes and that one in three have prediabetes. Within the Intermountain Medical Group, 17,000 patients meet criteria for prediabetes, and another 80,000 have risk factors for the disease.

The Primary Care Clinical Program Diabetes Prevention Program (DPP) was designed to help those with prediabetes prevent or delay the onset of type 2 diabetes. The program is based on evidence, suggesting that if a person loses 5 percent of their body weight, he or she can decrease the chance of getting type 2 diabetes by 58 percent in two years.

The DPP offers three pathways to achieve the 5 percent weight loss: the *Weigh to Health* program, medical nutrition therapy, and the two-hour group class “Prediabetes 101.”

“For as easy as this solution sounds, it can be difficult for a person to make the changes necessary,” said Kim Brunisholz, Delivery System Science Fellow and overseer of research for the Diabetes Prevention Program at Intermountain Healthcare. “To help patients make these difficult changes, Intermountain has developed three pathways that cater to different needs and preferences.”

### HOW EFFECTIVE IS THE PROGRAM?

Results from the program show that patients who participate are 70 percent more likely to achieve a 5 percent weight loss in six to 12 months and are more than 50 percent less likely to develop diabetes in the first year after participating than those who do not. The program has a 75 percent participation rate and has seen an estimated 2,700 patients since it started in 2013.

“We estimate that we have avoided or delayed 51 cases of diabetes since the program began, which has saved roughly \$400,000,” said Kim.

## ..... BASED ON OUR RESULTS, FOR 100 PEOPLE WITH PREDIABETES .....



**5 PEOPLE WILL GET DIABETES** in the next year if they make no lifestyle changes.



**2 PEOPLE WILL STILL GET DIABETES** but **3 PEOPLE WILL AVOID DIABETES** in the next year by participating in the Diabetes Prevention Program and living a healthier lifestyle.

## DENNIS'S STORY

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"Not much in this life scares me, but type 2 [diabetes] does," said Dennis Barker, a 77-year-old bus driver and retired justice court judge from Newton, Utah.

Dennis went to see his doctor for his annual Department of Transportation physical. Dr. Brad Goates, Dennis's physician at Logan Clinic reviewed his blood test results with him and informed him that he didn't have type 2 diabetes yet, but his results were on the high end of normal, meaning he would likely develop type 2 diabetes unless he made some lifestyle changes. To help Dennis, Dr. Goates invited him to visit a dietitian at the clinic.

"He told me, 'you can prevent this from happening.' I said, 'how?' He said 'lose weight and get more active.'"

"Type 2 diabetes is a lifelong disease that can bring about serious and life-threatening health complications," said Kim Brunisholz, Delivery System Science Fellow and overseer of research for the Diabetes Prevention Program at Intermountain Healthcare. "By being proactive with your life, you can live the healthiest life possible."

Dennis said, "I made the decision to do something about it rather than just say, 'well I'll let it go and let the doctors give me pills and shots.' That's not in my DNA."

Using the things he learned from the dietitian, Dennis has experienced measurable progress. "I weigh almost 60 pounds less than I did a year ago, my numbers are down to the normal level, and my blood pressure has dropped," Dennis said proudly.

"Not everyone is going to go out and run a marathon," Kim clarifies, "but you can make small steps toward having a successful story."



# New efforts to control high blood pressure

## *prevented an estimated 185 heart attacks over a 5-year period*

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High blood pressure is a silent killer. One in every three adults has high blood pressure, and it's the primary or contributing cause of death for nearly 1,000 patients per day. Diet, exercise, and medication are effective treatments, yet nationally only half of those diagnosed have their blood pressure in control. Intermountain Healthcare identified 144,000 patients with high blood pressure and had one objective: improve the percentage of those in control of their blood pressure.

### **A TEAM APPROACH**

Under the direction of the Primary Care Clinical Program, a multidisciplinary development team was created to tackle high blood pressure and provide better data and tools for clinicians and patients. In partnership with Intermountain's clinics, the team implemented the following strategies in 2015:

- Trained direct care staff in accurate blood pressure measurement
- Created a care process model with a standardized treatment algorithm to guide clinical management

- Built a population health registry to track and monitor adherence to best practices
- Developed reports to identify patients who were not in control, encourage more frequent follow-up visits, and recommend interventions
- Educated patients about healthy lifestyles and how to monitor and measure blood pressure at home
- Rechecked blood pressure during the same visit for patients with elevated blood pressure
- Scheduled two- to four-week follow-up visits for patients who started or changed medication

### **THE RESULTS**

In January 2015, 65 percent of Intermountain's identified blood pressure patients were in control. By the end of the year, that percentage improved to 68 percent, representing an increase of 6,865 patients in control of their blood pressure and preventing an estimated 185 heart attacks within our system over a 5-year period.



# Choosing Wisely® guides caregivers and patients *to high-quality care that saves money*

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The Institute of Medicine estimates up to 30 percent of healthcare delivered in the U.S. is unnecessary and may cause harm. For years, it has been Intermountain's focus to deliver best-practice care and eliminate care that is unnecessary and potentially harmful. Many teams are working on best-practice care, but Intermountain determined the need for a utilization management committee to identify and help curb the use of high-volume tests and medications that had no evidence to support them.

## **THE KEY OBJECTIVE: TO IDENTIFY HIGH-VOLUME BUT UNNECESSARY TESTS AND PRESCRIPTIONS**

Patterned after the Choosing Wisely® campaign of the American Board of Internal Medicine Foundation, the Primary Care Clinical Program looked at national guidelines and recommendations as well as Intermountain data to develop Choosing Wisely® care process models for adults and pediatrics, resources for decision making at the point of care, and patient education. Focus areas prone to overuse or misuse include the following:

- **Imaging:** Avoid imaging tests in acute low back pain unless there are red flags for serious pathology or injury.

- **Lab tests:** Limit lab tests to those with an evidence base that supports their use.
- **Medications:** Use antibiotics and other drugs only when truly necessary; choose generics when possible.
- **Preventive care:** Encourage preventive care visits—but not unnecessary tests.
- **Under-used care:** Don't skip the important, evidence-based tests and treatments.

Choosing Wisely® reports to gauge progress are updated monthly online in the reports center and provided to providers quarterly in print.

## **THE RESULTS: IMPROVE CARE, SAVE MONEY, AND EDUCATE PATIENTS**

Intermountain expects significant savings to both the healthcare system and to patients when unnecessary tests and prescriptions are avoided and the focus is on proven effective treatments. As patients are educated, they are more likely to follow the recommendations.

## Precision genomics holds great promise *for cancer patients today and in the future*

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Intermountain Healthcare serves more Utah cancer patients than any other health provider, with medical outcomes significantly better than the national average. Our Oncology Clinical Program looks at proven, leading-edge cancer treatment techniques and technologies, combined with a team approach to care, to provide optimal care for patients.

Precision genomics is a robust part of our Oncology Clinical Program, holding tremendous promise for cancer patients in Utah and across the nation. “We’re translating science into medicine,” said Lincoln Nadauld, MD, PhD, Executive Director of Intermountain Precision Genomics. “That’s what precision genomics really is—taking basic scientific principles that are transformative and then trying to leverage those into better treatments and better outcomes for patients. That’s what Intermountain Healthcare has a real skill at doing. And it’s completely exciting and thrilling to be part of it.”



Intermountain  
Precision Genomics  
Cancer Research Clinic

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INTERMOUNTAIN HEALTHCARE IS ABLE TO IDENTIFY ACTIONABLE MUTATIONS AND OFFER ADDITIONAL TREATMENT OPTIONS FOR MORE THAN 75 PERCENT OF PATIENTS WITH ADVANCED-STAGE CANCER. THESE TREATMENTS CAUSE FEWER SIDE EFFECTS, OFTEN AT THE SAME OR LESS COST THAN TRADITIONAL CHEMOTHERAPY.

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# More than 75 percent of patients with advanced-stage cancer *have additional treatment options through precision genomics*

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Intermountain's Precision Genomics physicians and scientific experts have built the infrastructure and processes to sequence the DNA of individual tumors and evaluate which specific mutations might be making a cancer grow. Providers locally, nationally, and internationally order testing and treatment for cancer patients. For more than 75 percent of patients with advanced-stage cancer, Intermountain is able to identify actionable mutations and offer patients additional treatment options. These are mainly oral-targeted therapies given as a pill that patients can take at home with fewer side effects and often at the same or less cost than traditional chemotherapy.

## **Additional developments:**

1. The new Intermountain Precision Genomics Cancer Research Clinic on the Intermountain Medical Center campus offers qualified patients access to the latest clinical trials and investigational drugs and opens up precision genomics possibilities throughout the Intermountain system.

2. Intermountain is participating as an early adopter of the American Society of Clinical Oncology (ASCO) CancerLinQ program, the nation's largest leading cancer informatics program.
3. The Obama administration is including Intermountain in its efforts to fight cancer, including the "moonshot" initiative seeking to cure cancer.
4. Intermountain is developing a robust cancer immunology program, which looks at interactions between the immune system and cancer. This team will develop genetic markers to predict which immunotherapies could be most effective for treating and slowing tumor growth.

The collective result of Intermountain's renowned precision genomics efforts shines a bright spotlight of opportunity for treating cancer today and in the future.



A decade-long focus  
on early identification and  
treatment of sepsis  
*has significantly reduced mortality  
at Intermountain hospitals*

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Sepsis is a life-threatening complication of an infection and the leading cause of death in non-coronary intensive care unit (ICU) patients in the U.S. Quick identification and early delivery of evidence-based treatment are critical to best care and improved patient outcomes. Mortality rates range widely, from 10 percent to over 50 percent, across the spectrum of sepsis—from early stages to its more severe forms, including severe sepsis and septic shock. Timing of appropriate therapy is critical to achieving desired clinical outcomes.

Intermountain has significantly reduced mortality by consistently applying its sepsis bundle and providing education on early identification of sepsis through the focused efforts of the Intensive Medicine Clinical Program.



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THROUGH THE INTENSIVE MEDICINE CLINICAL PROGRAM'S EFFORTS TO PROVIDE EDUCATION FOR EARLY IDENTIFICATION OF SEPSIS AND IMPLEMENT AND IMPROVE COMPLIANCE WITH THE SEPSIS BUNDLE, INTERMOUNTAIN HAS SIGNIFICANTLY DECREASED MORTALITY RATES FROM SEPSIS.  
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# The Intensive Medicine Clinical Program's work has resulted in raised national standards *of caring for patients with sepsis*

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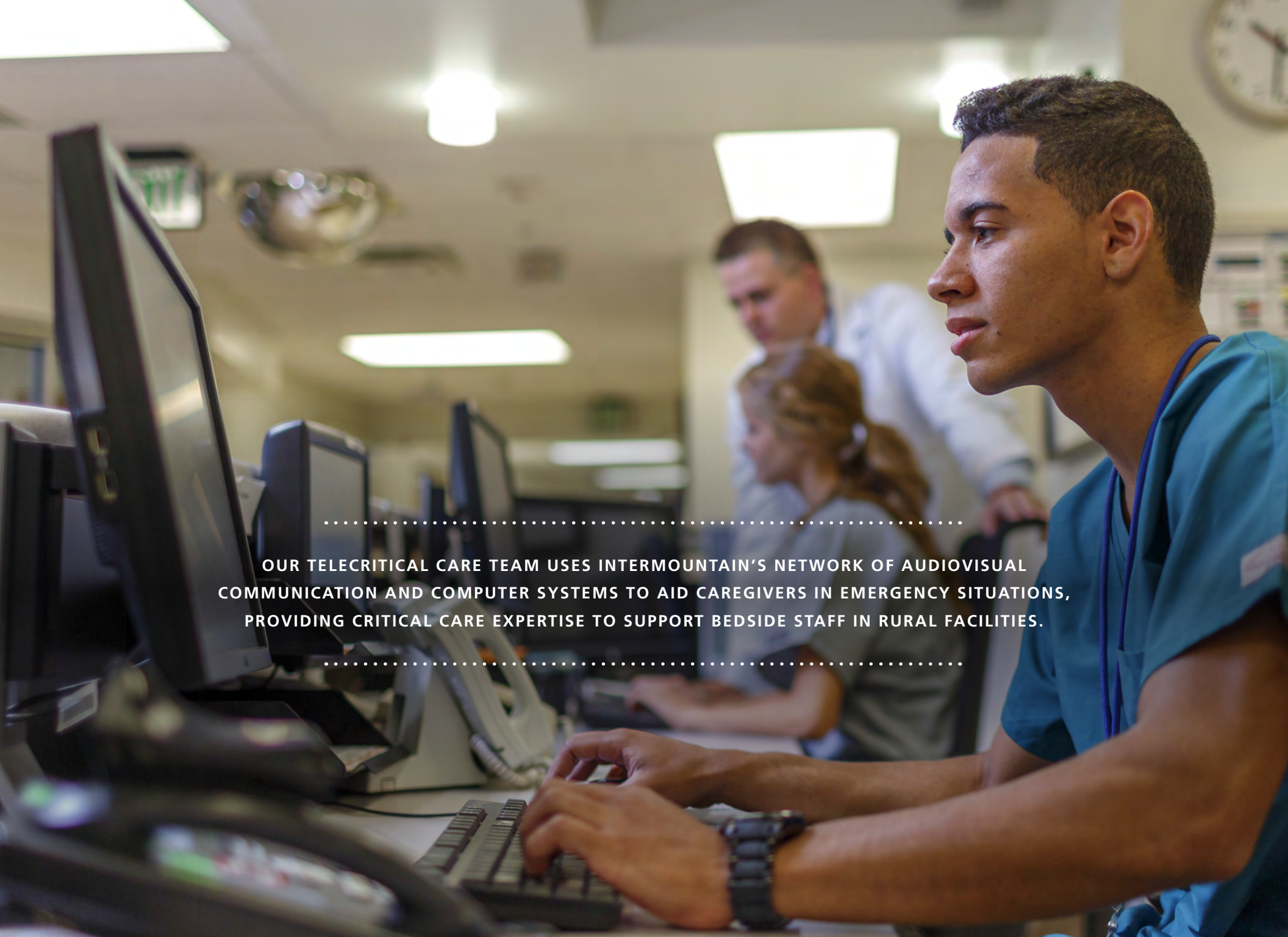
In 2005, the Intensive Medicine Clinical Program conducted a multi-year, longitudinal quality-improvement initiative focused on patients with severe sepsis or septic shock. The goal was to significantly increase compliance with 11 elements identified in a sepsis bundle and to reduce in-hospital mortality rates in patients with severe sepsis or septic shock who were admitted to the ICU from the emergency department (ED). The complete bundle compliance (all 11 elements) increased from 4.4 percent, the 2004 baseline, to 74.7 percent at the end of 2010. The mortality rate for the same period decreased from 20.8 percent to 8.7 percent.

In 2014, the Intensive Medicine Clinical Program broadened the patient population to include patients who develop severe sepsis or septic shock and who are initially admitted to an acute inpatient setting. Broadening the goal to include inpatient sepsis from an acute care setting provides new opportunities for improvement of the care Intermountain provides

patients with severe sepsis and septic shock. The Clinical Program's clinical experts believe the greatest impact on hospital mortality for this population can be achieved by 1) providing education for early identification of sepsis, and 2) implementing the sepsis bundle on acute care floors, while improving the compliance of the sepsis bundle for patients admitted from the ED to the ICU. Intermountain has seen earlier initiation of appropriate therapies as a result of its focused efforts.

As a result of educating care providers and implementing the sepsis bundle over the last several years, Intermountain has significantly decreased mortality across the enterprise.

“Intermountain Healthcare has become recognized nationally and internationally as a leader in the care of septic patients and is helping set new benchmarks for sepsis outcomes,” said Terry Clemmer, MD, Medical Director of the Intensive Medicine Clinical Program.



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OUR TELECRITICAL CARE TEAM USES INTERMOUNTAIN'S NETWORK OF AUDIOVISUAL  
COMMUNICATION AND COMPUTER SYSTEMS TO AID CAREGIVERS IN EMERGENCY SITUATIONS,  
PROVIDING CRITICAL CARE EXPERTISE TO SUPPORT BEDSIDE STAFF IN RURAL FACILITIES.  
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# TeleCritical Care technology brings intensive medicine and critical care expertise to the bedside at rural facilities *and supports clinicians in emergency situations*

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TeleCritical Care at Intermountain Healthcare is the service provided by a proactive monitoring and response center, where an intensivist physician and critical care nurses monitor data on large patient populations and act as clinical decision support to bedside staff.

Intermountain officially formed the telemedicine initiative five years ago and began to incorporate it into clinical operations. Over that period of time, we've emphasized the development of our telemedicine services in conjunction with our Clinical Programs—specifically Critical Care, a branch of Intensive Medicine—and we've recently expanded telemedicine services to serve all ICUs throughout our system.

This TeleCritical Care team uses Intermountain's network of audiovisual communication and computer systems to aid caregivers

in emergency situations. In addition to these events, TeleCritical Care plays a direct role in ensuring that established best practices are applied reliably across the ICU population. This service is especially needed in our rural populations, where critical care services are not as robust.

The TeleCritical Care initiative and services are run by a support center that includes a team of 22 doctors and 20 nurses, serving 263 critical care beds across 12 facilities in Utah and Idaho.

Since the TeleCritical Care group was formed, Intermountain has observed improvements in mortality rates in community and tertiary care facilities. The greatest improvements have occurred in community hospital ICUs and in overall mortality rates.



# The Suicide Prevention Care Process Model *helps clinicians identify patients at risk*

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Suicide is the leading cause of preventable death in Utah, accounting for approximately 10 deaths a week. According to 2012-2014 data from the Centers for Disease Control and Prevention, each year, an average of 557 Utahns died by suicide and more than 4,700 Utahns attempted suicide. The data show that Utah adults have the highest incidence of suicidal thoughts in the U.S.—6.8 percent of Utah adults reported having suicidal thoughts during 2008-2009. The national average during the same period was 3.7 percent.

The U.S. Preventative Services Task Force discovered that many patients who die by suicide visit a healthcare provider within a month before their deaths (2014), which means clinicians are in an excellent position to help. With the right tools and resources in place, we believe we can help prevent suicide among our patients and in our communities.

# The Behavioral Health Clinical Program *instituted a Suicide Prevention Care Process Model* across Intermountain

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Prevention starts with asking questions, and Intermountain's Suicide Prevention Care Process Model (CPM) offers questions that are informed by guidelines from the American Association of Suicidology and the Center for Suicide Risk Assessment at Columbia University Medical Center.

The CPM provides guidance for prevention, assessment, and treatment for patients with suicidal thoughts, feelings, or behaviors. The CPM focuses on prevention and treatment in primary care, emergency rooms, and hospitals, though it may also be applied to other clinical

environments. It encourages clinicians to screen patients through a series of questions and observations to determine where they may fall on the Columbia-Suicide Severity Rating Scale (C-SSRS) in conjunction with a risk assessment and safety planning. The scale is used to assess how likely an adult or adolescent is to commit suicide and is used in both inpatient and outpatient environments. Intermountain uses several versions of the C-SSRS to consistently identify and track patient suicide ideation and behaviors across the continuum of care.

## **INTERMOUNTAIN HAS DEVELOPED A NUMBER OF ALGORITHMS TO HELP CLINICIANS ASK THE RIGHT QUESTIONS IN A VARIETY OF SITUATIONS.**

Using the C-SSRS scale, Intermountain developed a number of algorithms (question-and-answer prompts) that guide clinicians and help them make decisions and offer appropriate education. These algorithms are integrated into iCentra, Intermountain's electronic health record

system, to give clinicians decision support and education links based on patient responses. Safety planning is a critical and proven component of helping these patients. Intermountain provides safety tools patients can use when suicidal thoughts arise after discharge.

**SIX GOALS AND MEASUREMENTS**  
**DRIVE SUCCESS IN THE SUICIDE PREVENTION CARE PROCESS MODEL**



# Intermountain helps tackle prescription opioid misuse, addiction, and overdose

According to the Utah State Health Department, Utah is fourth in the nation for drug overdose deaths (2012–2014) and has experienced a 400 percent increase in prescription opioid-related deaths, averaging

one opioid-related death every day in 2014. In 2012, Utah providers wrote 85.8 opioid pain reliever prescriptions per 100 people, the 22nd highest prescribing rate in the country.

## COLLABORATING WITH THE COMMUNITY

To tackle this problem, Intermountain partnered with the Division of Substance Abuse and Mental Health, the Utah Department of Health, Weber Human Services, Davis Behavioral Health, and other community agencies in 2015 to form the Opioid Community Collaborative (OCC).

### Together, our efforts are focused on these key areas:

- **Public awareness and education:** Intermountain supported the “Use Only as Directed” multi-media campaign focused on the proper storage, use, and disposal of prescriptions. Drop boxes are provided in 21 Intermountain community pharmacies.
- **Provider education:** Intermountain trained 1,500 medical providers

about the consequences of opioid misuse, collected and shared baseline data regarding prescribing patterns, and developed care process models to guide prescribing practices.

- **Treatment:** Intermountain funded a three-year demonstration project in Weber and Davis counties (Ogden has one of the highest death rates from opioid misuse in the state at 26.9 per 100,000 people) designed to test the effectiveness of medication-assisted treatment combined with counseling. The project targets underserved populations. Recently, Intermountain has also made naloxone (a lifesaving medication that temporarily reverses the effects of opioids) available without a prescription in all its community pharmacies.

## THE RESULTS

- **Better community awareness:** In a 2016 Dan Jones survey of 600 individuals, 81 percent of respondents said they definitely believe prescription pain medication had a potential for abuse and addiction (up from 41 percent in 2010).
- **Increase in proper disposal:** 6,404 pounds of medications were disposed of in Intermountain's 21 community pharmacy disposal drop boxes over 15 months.
- **Effective treatment:** In 12 months, the OCC project has seen an 83-85 percent abstinence rate for those who received medication-assisted treatment combined with counseling, compared to 64.5 percent for those treated by local public health providers and without the use of medication-assisted treatment.

### EXAMPLE OF ADVERTISING CAMPAIGN SHOWN ACROSS UTAH





## SURGICAL SERVICES

# Intermountain's surgical teams effectively use data sharing—*called ProComp—to improve value for patients*

Using data to influence decisions, behaviors, and outcomes is as essential to improving healthcare delivery at Intermountain as it will be to transforming healthcare globally.

Intermountain's Surgical Services ProComp initiative employs resources to provide surgeons transparent access to meaningful costs and outcomes data related to procedure comparisons, provider comparisons, patient-reported outcomes comparisons, and supply comparisons. It also provides a forum to discuss those results.

The Surgical Services Clinical Program has been working with physicians, using ProComp, to improve the value of healthcare in three specific clinical areas related to surgery: appendectomies, blood utilization, and tonsillectomies. Using ProComp cohorts and targeted data, physician-led collaborations have found practical solutions to reduce variation in care and ultimately make high-quality care more affordable.

# Sharing data with physicians has led to high-quality care *at lower costs in three clinical areas related to surgery*

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## APPENDECTOMY

Pediatric general surgeons at Primary Children's Hospital discovered significant variation in supply costs for a laparoscopic appendectomy, with the average supply cost per case landing around \$840 per surgery. Within one year of reviewing data and collaborating on best practice, our experts agreed on a standardized approach to the surgery and brought the supply costs down to \$275 per case with no negative impact to quality outcomes for patients. This 67 percent decrease in

supply costs has supported a 35 percent decrease in direct costs, an 18 percent decrease in total costs, a 16 percent decrease in total charges, a 23 percent decrease in insurance payments, and a 17.9 percent decrease in other payments. Following successful standardization at Primary Children's Hospital, the physicians shared the practice changes in forums where surgeons across the system learned about opportunities to improve care in other areas.

## BLOOD UTILIZATION

The Surgical Services Clinical Program analyzed data that showed patients who received blood at Intermountain received two units 50 percent of the time, whether they needed two units or not. Although ordering two units of blood for every transfusion has historically been a practice taught in medical schools, it's not an evidence-based practice.

The Surgical Services Clinical Program implemented evidence-based transfusion protocols, and physicians across the system championed

protocol education to other clinicians. Since 2012, the project has decreased the number of transfusions by more than 12,000, eliminating \$3 million in costs. Blood utilization continues to be a measure that the Surgical Services Clinical Program keeps in front of physicians. A customized report is sent to all providers whose patients have received blood during their care. By reviewing the reports, our physicians can track their orders for one or two units of blood and make more informed decisions going forward.



## TONSILLECTOMY

A physician-led case study reviewed the variation of costs and outcomes associated with the different devices used during a tonsillectomy.

The average supply costs for various tools to perform this same procedure had a wide range:

- \$46 for electrocautery
- \$254 for coblation
- \$202 for a microdebrider
- \$346 for a Harmonic scalpel
- \$40 for a basic steel knife blade

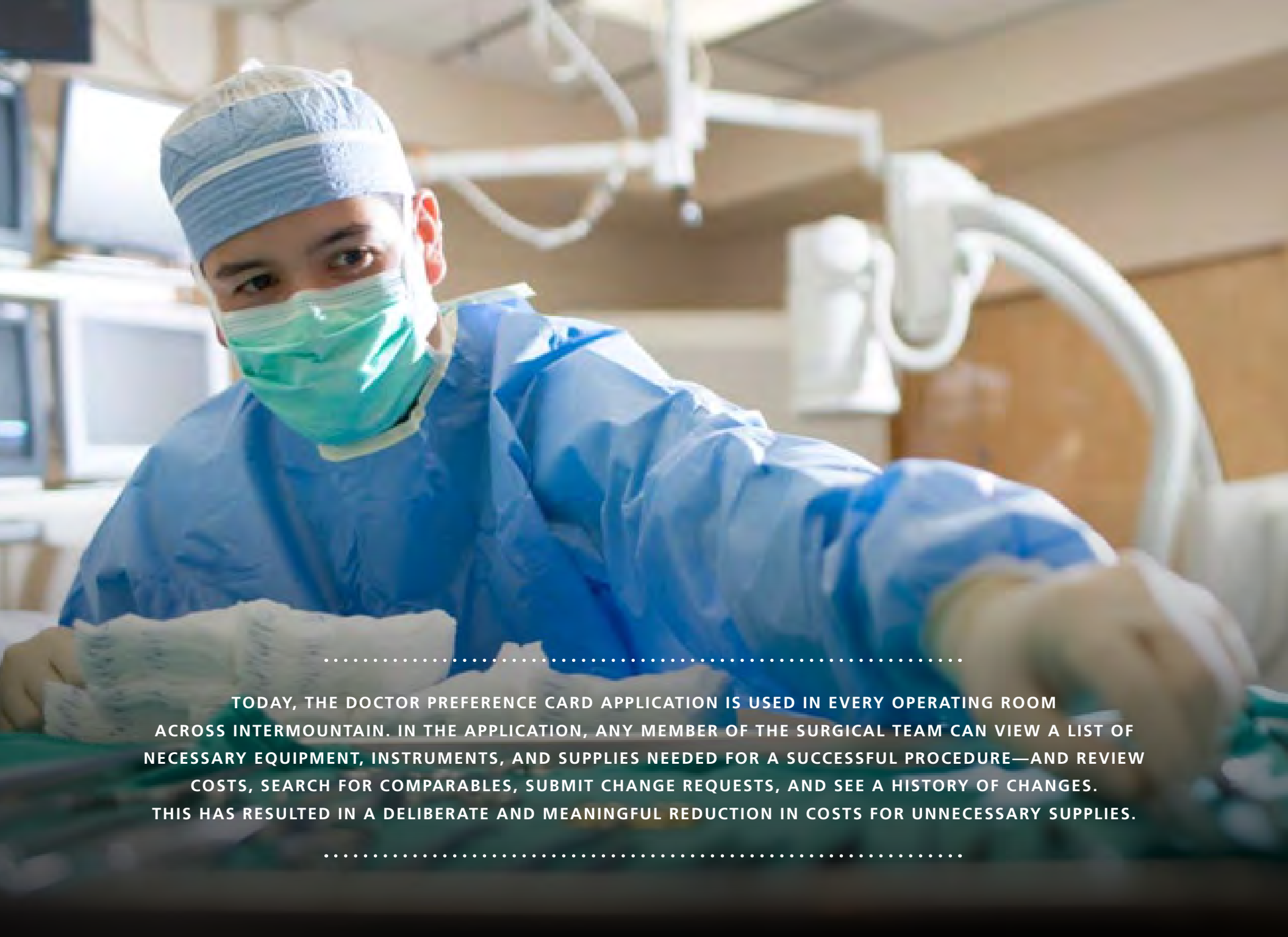
Basic outcomes data—consisting of surgery time, PACU time, complications, and hemorrhage statistics—indicated there was no difference in the complication rate based on the device used.

To prepare meaningful data that would be compelling enough to change the practice of providers, the Surgical Services Clinical Program began work on collecting patient-reported outcomes as well: More than 650 parent responses were voluntarily offered from the 1,444 patients included in the tonsillectomy study. Parents reported outcomes for the child's pain score on days 2, 3, 7, and 14; the number of days until the child returned to normal activity; the number of days until the child resumed a normal diet; the number of days the child no longer needed any pain medication; and the number of days until the child stopped

taking narcotics. These outcomes again indicated no statistical difference between the devices used during the procedure.

Educating physicians about this data through a customized report has led to more physicians reconsidering the devices they use during a tonsillectomy, and ultimately, will lead to consistent high-quality care at more affordable costs for patients.





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TODAY, THE DOCTOR PREFERENCE CARD APPLICATION IS USED IN EVERY OPERATING ROOM ACROSS INTERMOUNTAIN. IN THE APPLICATION, ANY MEMBER OF THE SURGICAL TEAM CAN VIEW A LIST OF NECESSARY EQUIPMENT, INSTRUMENTS, AND SUPPLIES NEEDED FOR A SUCCESSFUL PROCEDURE—AND REVIEW COSTS, SEARCH FOR COMPARABLES, SUBMIT CHANGE REQUESTS, AND SEE A HISTORY OF CHANGES. THIS HAS RESULTED IN A DELIBERATE AND MEANINGFUL REDUCTION IN COSTS FOR UNNECESSARY SUPPLIES.

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# Doctor preference cards evolve to a multi-functional tool to maintain *surgeon preferences, track costs, and compare surgical supplies*

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Doctor Preference Cards (DPCs) are used in every operating room across Intermountain Healthcare. DPCs are much like a recipe card to follow and list all the necessary equipment, instruments, and supplies needed for a successful procedure. The DPC also includes specific notes or comments that are meaningful to the surgeons and other clinicians to provide the best care. Knowing exactly what supplies to have in the operating room and when to have them available is key to safety, efficiency, and accuracy in billing for the procedure.

Before transitioning Intermountain facilities to iCentra, the Surgical Services Clinical Program discovered that the system-wide library of DPCs had grown to greater than 55,000 unique cards. Before users could submit change requests through the DPC tool, all requests were submitted in writing. Across the system, there were piles of DPCs waiting to be electronically updated, with some piles

having requests sitting longer than three months. This proved to be frustrating for surgeons and staff.

The DPC tool is an application developed by the Surgical Services Clinical Program's ProComp team to standardize how DPCs are maintained, as well as provide more transparent access to supply costs. Today the DPC tool is used in every operating room across Intermountain. Users can log in and view any DPC at any Intermountain facility. They can see the costs of supplies, search for comparable products, submit change requests for a particular DPC, and see the history of changes made for a DPC. With an annual Surgical Services Clinical Program goal to review active DPCs, surgical teams have seen a deliberate and meaningful reduction in unnecessary cards, bringing our active DPCs down to 22,000 and reducing costs by more than \$2.5 million for unnecessary supplies.



## Intermountain improves treatment for pneumonia *by implementing new evidence-based care practices*

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Pneumonia is the leading cause of death in children worldwide. Each year, more than 2 million children younger than 5 years old die from pneumonia, representing approximately 20 percent of all deaths in children within this age group. Within Intermountain, pneumonia is the fourth-most common reason for a pediatric admission to the hospital and is the pediatric condition with the fourth-highest cost.

When the Pediatric Infectious Disease Society and Infectious Disease Society of America published a new national guideline for the management of community-acquired pneumonia (CAP) in 2011, Intermountain's Pediatric Specialties Clinical Program evaluated their practices to continue providing pediatric patients with the best possible evidence-based care and launched a care process model that incorporated the national recommendations.

# The Pediatric Specialties Clinical Program *tackles the misuse of antibiotics*

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The team also evaluated the practice within our system to gauge consistency with national guidelines in treating children with community-acquired pneumonia (CAP). They found that most children with CAP were receiving antibiotics, and more than 30 wide-spectrum antibiotics were being prescribed. The national guideline directed the use of penicillins that are narrow-spectrum and very effective for agents that cause CAP. Penicillins were often not being prescribed at Intermountain. These practices, before evaluation, meant Intermountain caregivers were exposing kids to antibiotics unnecessarily and increasing their risk to develop antibiotic resistance.



The Pediatric Specialties Clinical Program, with system-wide support of many teams, worked to address the issue through the following tactics:

- **Developed tools** such as the CAP care process model and a flashcard to help educate and guide pediatric clinicians to follow best practices for antibiotic use, testing, and other protocols.
- **Established a system-wide board goal** to switch to a common antibiotic (ampicillin/amoxicillin) and reduce the number of wide-spectrum antibiotics.
- **Implemented training**, led by our infection control team, to educate pediatric teams about the new guidelines, process, and goals. This effort included education at grand rounds, presentations to pediatric teams, and distribution of the tools.
- **Created partnerships** with Primary Children's antibiotic stewardship program (which includes infectious disease and pharmacy) to help monitor antibiotic usage.
- **Educated the public** about appropriate use of antibiotics.

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WITHIN A FEW MONTHS, INTERMOUNTAIN ACHIEVED 90 PERCENT COMPLIANCE SYSTEM-WIDE WITH OUR GOAL TO USE AMPICILLIN/AMOXICILLIN FOR CARE OF COMMUNITY-ACQUIRED PNEUMONIA. IN ADDITION, INVESTIGATIONS HAVE FOUND THAT CLINICIANS AREN'T PRESCRIBING ANTIBIOTICS FOR CHILDREN WHEN THEY AREN'T EFFECTIVE, SUCH AS WITH VIRAL PNEUMONIA. THESE RESULTS ARE LEADING TO CHILDREN'S LONG-TERM PROTECTION.

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# GermWatch helps caregivers and consumers *track and treat illnesses in the community*

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In 2002, GermWatch was introduced to monitor illnesses during the Olympics. In partnership with the Utah Department of Health, the University of Utah Health Care system, and other organizations and clinicians, GermWatch has continuously improved to help physicians and consumers track and treat illnesses. Recent funding from the Intermountain Innovation Foundry provided the opportunity to invest in a robust infrastructure to substantially improve the service and take it to the next level.

Some key improvements to GermWatch's quality, content, and data include:

- **Additional data sources:** In addition to testing data, the system now collects and analyzes data from iCentra, Intermountain's Electronic Data Warehouse (EDW), TeleHealth, emergency department notes, primary care notes, and facility visit data.

- **Expanded illness monitoring:** In addition to respiratory illness, the service now offers tracking for gastrointestinal illnesses.
- **New trend analysis and predictability tools:** Using syndrome analysis, GermWatch provides public health surveillance with the ability to identify trends and predict illnesses such as flu, EV-D68 virus, RSV, pandemics, and bioterrorist events.
- **Mobile access:** GermWatch is now featured on Intermountain's Health Hub app.
- **Targeted mapping:** Heat maps now target 61 areas by ZIP code to predict local outbreaks and see how illnesses are spreading.
- **Growing reach:** The service generates 40 reports and more than 671 emails to clinicians, infection control specialists, administrators, and public health professionals.

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## CLINICIANS AND CONSUMERS BENEFIT FROM GERMWATCH

*Over the past 15 years, the number of clinicians subscribing to GermWatch's email updates has grown from 20 to more than 430.*

*Clinicians enjoy access to trending and predictability tools, expanded breadth and depth of information in an easier format, additional illness information, more educational offerings, dashboards, business intelligence, and mobile access.*

*Consumers also benefit from improved activity indicators and maps, mobile access, and important education on common illnesses to help them know actions to prevent illness and when to seek care.*



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GERMWATCH, AN ILLNESS MONITORING SYSTEM DEVELOPED IN COLLABORATION WITH THE UTAH DEPARTMENT OF HEALTH AND UNIVERSITY OF UTAH HEALTH CARE SYSTEM, HAS CONTINUOUSLY IMPROVED TO HELP PHYSICIANS AND CONSUMERS TRACK AND TREAT ILLNESSES.

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## Physicians collaborate *to improve trauma fracture care*

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Trauma call often presents orthopedic surgeons with complex and unusual fractures. In some cases, determining whether to provide fracture care or refer to another surgeon can be challenging.

The Musculoskeletal Clinical Program is working to develop best-practice standards of care for complex injuries across the system and educate to those standards. When fracture care is treated effectively the first time, physicians achieve what's best for the patient and avoid additional costs downstream due to complications. Building strong physician and operational relationships helps create a supportive environment where physicians feel safe to identify their limitations and confident to initiate an effective and efficient referral process.



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ORTHOPEDIC SURGEONS COLLABORATE AND REVIEW COMPLICATED CASES, EXAMINE IMAGES AND OUTCOMES, AND IDENTIFY OPPORTUNITIES FOR IMPROVEMENT. THIS PROCESS REINFORCES THE STANDARD OF CARE AND GIVES PHYSICIANS INSIGHT INTO THE CASES THAT WOULD BE BEST FOR REFERRAL BASED ON THEIR OWN EXPERIENCE AND EXPERTISE.

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# Teamwork among orthopedic surgeons *is moving forward*

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The Musculoskeletal Clinical Program created a system-wide Trauma Fracture Development Team, which meets monthly to develop best-practice standards and establish effective referral processes. The development team includes a panel of orthopedic trauma surgeons and the Musculoskeletal Clinical Program leadership team, with Warren Butterfield, MD, as Medical Director.

At Dixie Regional Medical Center, a team of orthopedic surgeons, led by Dr. Butterfield, meets twice monthly to peer-review difficult cases, examine images and outcomes, and identify opportunities for improvement. This process is reinforcing the standard of care and gives physicians insight into the cases that would be best for referral based on their own experience and expertise.

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## THE FUTURE IS EXCITING

Physician collaboration in fracture care will continue to expand, in addition to other support efforts:

### **Sub-specialty collaboration:**

*Orthopedic surgeons across Intermountain will meet weekly by area of sub-specialty to collaborate and enhance optimal care for patients. Topics related to orthopedic trauma care will be regularly incorporated into the meetings.*

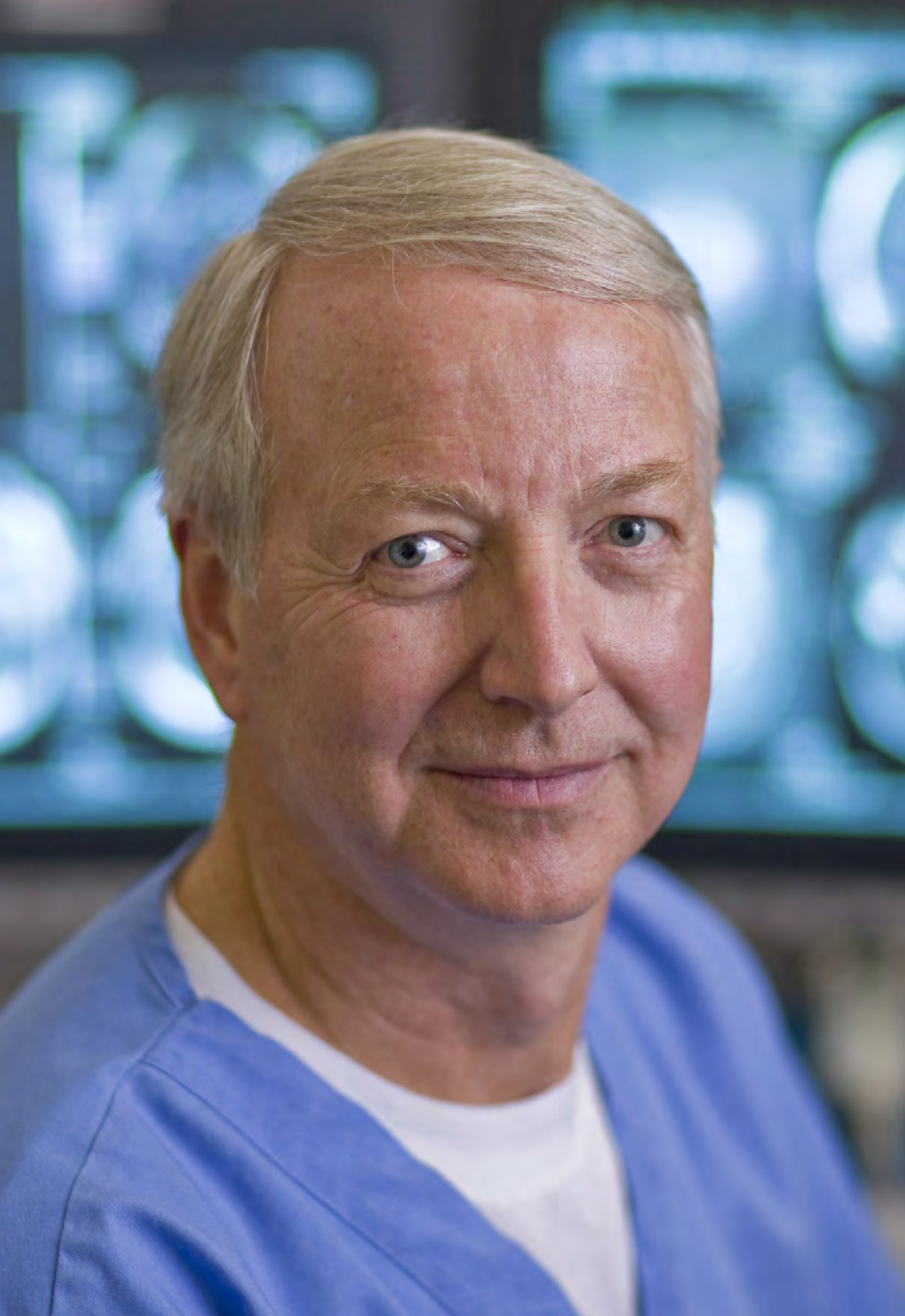
### **Outcomes measurement:**

*iCentra will provide outcomes measurement tools.*

### **TeleHealth:**

*Physicians can consult with other surgeons on a case-by-case basis to determine whether treating locally or referring is best for the patient.*

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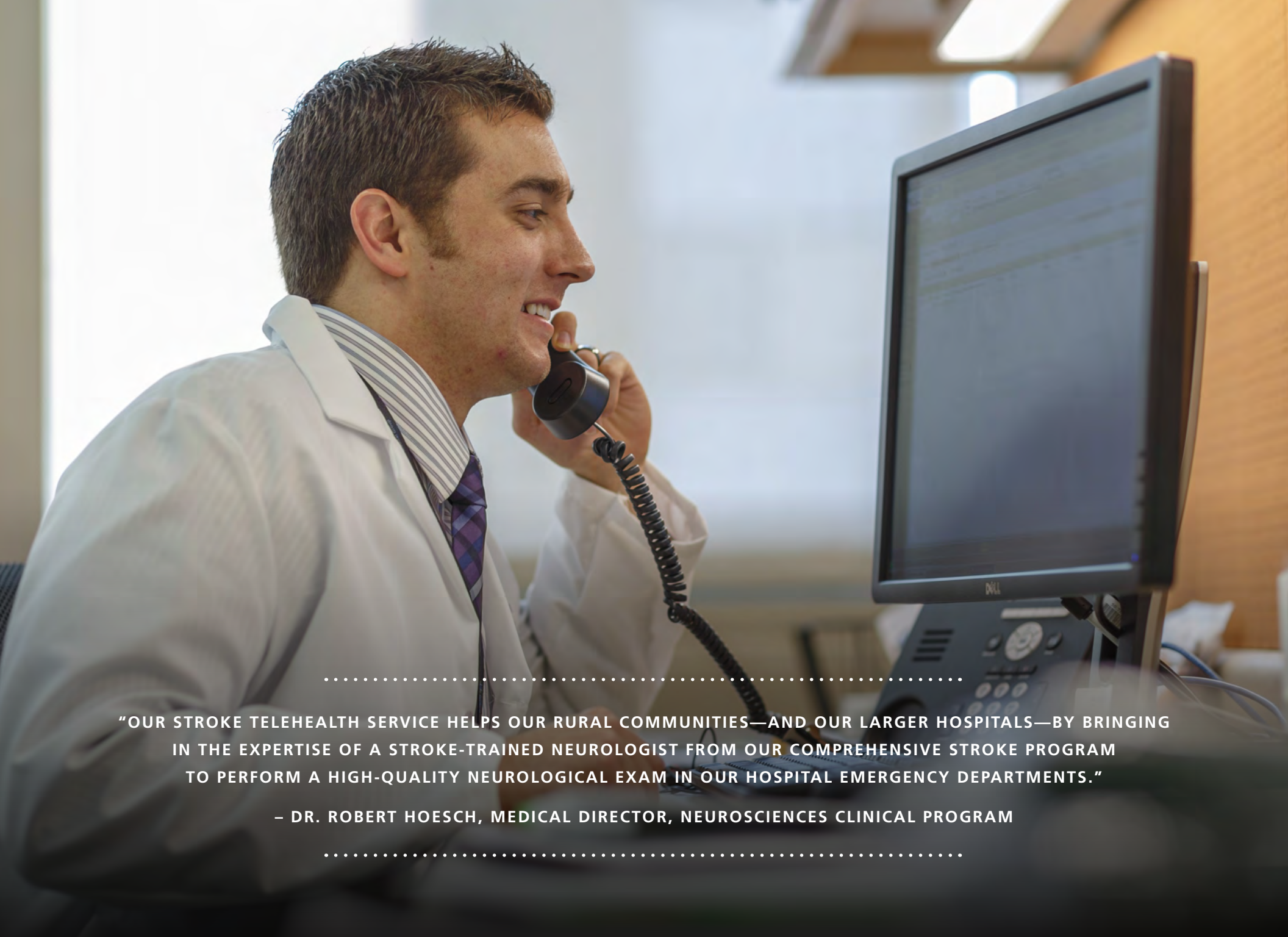
## TeleHealth service speeds treatment close to home *for stroke patients*

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The human brain is a marvel in its design and function. Each day, more than 2,000 people in the United States have a stroke, and 87 percent of the time, a stroke is caused when blood flow to the brain is blocked. For every second blood flow is interrupted, tens of thousands of brain cells die.

“The overarching philosophy in stroke care is: ‘time is brain,’” said Robert Hoesch, MD, neurologist and Medical Director of Intermountain’s Neurosciences Clinical Program. “The faster patients receive proper treatment, the better the outcome is likely to be, which means less disability.”

Intermountain’s Stroke TeleHealth Service helps ensure our patients experiencing stroke receive optimal treatment. Through this technology, emergency department clinicians at any Intermountain hospital, as well as their patients, have the ability to consult real-time with a neurologist, even in smaller community hospitals.



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"OUR STROKE TELEHEALTH SERVICE HELPS OUR RURAL COMMUNITIES—AND OUR LARGER HOSPITALS—BY BRINGING IN THE EXPERTISE OF A STROKE-TRAINED NEUROLOGIST FROM OUR COMPREHENSIVE STROKE PROGRAM TO PERFORM A HIGH-QUALITY NEUROLOGICAL EXAM IN OUR HOSPITAL EMERGENCY DEPARTMENTS."

– DR. ROBERT HOESCH, MEDICAL DIRECTOR, NEUROSCIENCES CLINICAL PROGRAM

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# The Neurosciences Clinical Program implements TeleHealth (Telestroke) Services system-wide, *allowing neurologists to consult real-time with clinicians at Intermountain hospitals*

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Neurosciences, established in 2014, is one of Intermountain’s two newest Clinical Programs. Previously, Intermountain had a Stroke Development Team under the Intensive Medicine Clinical Program, with a focus on identifying stroke care best practices. Intermountain made Stroke TeleHealth (Telestroke) Services an important priority to provide consistent, high-quality stroke treatment throughout our hospitals. This became a catalyst to developing a distinct Neurosciences Clinical Program. Thus, TeleHealth became the first Neurosciences priority initiative.

Intermountain’s Stroke TeleHealth Service allows a physician at our hospital emergency rooms who is treating a stroke patient to have a real-time consultation with a neurologist. “We want to treat patients in their community when it is possible and safe to do so,” said Dr. Hoesch. “Our Stroke TeleHealth Service helps our rural communities—and our larger hospitals—by bringing in the expertise of a stroke-trained neurologist

from our comprehensive stroke program at Intermountain Medical Center to perform a high-quality neurological exam in our hospital emergency departments.”

The only FDA-approved treatment for strokes caused by blockages to the brain, or clots, is tissue plasminogen activator (tPA), which is given through an IV in the arm and works by dissolving the clot and improving blood flow to the part of the brain being deprived of blood flow. The national standard for “door-to-needle” time—the time from which a stroke patient enters the hospital door to the time tPA treatment is given—is 60 minutes. At Intermountain Medical Center, our mean door-to-needle time is about 35 minutes, and our mean door-to-needle time at all our hospitals through our TeleHealth service meets the national standard of 60 minutes or less. This results in many patients being able to live the healthiest lives possible by avoiding disability or even death.

