Publication Year: 2013

Summary:

An advanced telehealth technology that speeds the initiation of diagnostic evaluation, reduces wait times, coordinates patient transfers and expedites treatments.

Hospital: Avera McKennan Hospital & University Health Center

Location: Sioux Falls, SD

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Category:

- **A: Arrival**
- **B: Bed Placement**
- **C: Clinician Initial Evaluation &Throughput**
- **D: Disposition**
- **E: Exit From the ED**

Key Words:

- **Care Transitions**
- **Consults**
- **Continuity of Care**
- **Information Systems**
- **Patient Satisfaction**
- **Telemedicine**

Hospital Metrics:

- **Annual ED Volume: 27,000**
- **Hospital Beds: 500**
- **Ownership: Avera Health**
- **Trauma Level: 2**
- **Teaching Status: Yes**

Tools Provided:

- **eEmergency Quick Sheet**
- **eEmergency Site List**
- **eEmergency Outcomes**

Clinical Areas Affected:

- **Ancillary Departments**
- **Emergency Department**

Staff Involved:

- **Administrators**
- **Communications**
- **ED Staff**
- **IT Staff**
- **Nurses**
- **Pharmacists**
- **Physicians**

URGENT Matters

Innovation

At the touch of a button, rural clinicians and patients have virtual access to the eEmergency team of board-certified emergency physicians and emergency nurses who can assist in the management of critical conditions such as heart attack, stroke and trauma. Often the bridge between patient presentation and the arrival of on-call physicians, Avera eEmergency uses advanced telehealth technologies to speed the initiation of diagnostic evaluation, reduce wait times, coordinate patient transfers, expedite treatments, free local staff to remain focused on the patient and family and, in many cases, help patients stay close to home and avoid transport. **(eEmergency Quick Sheet)**

The goal of Avera eEmergency is to reduce disparities in rural health care access and quality through the use of advanced communication technologies. Avera eEmergency makes the resources of an urban health care facility available to the smallest communities, eliminating geographic barriers to care and making it possible for every patient to receive timely access to the highest quality care, every time.

Rural providers are faced with a seemingly impossible task--to provide high-quality, appropriate care with very limited resources. Rural facilities lack the specialist services available in larger urban centers and are not able to provide advanced interventions, such as coronary catheterization or ambulatory surgery. Recent studies have accused rural facilities of providing lower-quality care than their urban counterparts, when in actuality, they simply do not share the same resources or access to specialty care. Diminishing rural populations and professional isolation make clinician recruitment and retention a challenge in rural communities. A rural community might be supported by only one or two family practice physicians who must take call one out of every two days. Long clinic hours and frequent call responsibilities lead to high rates of provider burn out and difficulty with physician retention. To compound the problem, medical residents do not receive the special training needed to succeed in an isolated rural community with limited collegial support. All of these challenges are compounded by diminishing community economics and low healthcare margins in rural communities. Avera eEmergency is uniquely designed to meet the needs of its target population. In addition, the care delivery model is scaled for cost-effectiveness, quality and service.

Upper Midwestern residents are disadvantaged when it comes to health care services because of lack of timely emergency services, distance from providers, lack of access to specialty and ancillary services, aging provider populations and difficulty recruiting new clinicians. Geographic isolation means that often, residents must travel one hundred miles or more to receive needed healthcare services. Too many times this results in the foregoing healthcare services due to an inability or an unwillingness to travel. Avera has invested heavily in telehealth as a strategy to improve the health and lives of people and communities across the region.

Innovation Implementation

The Avera eEmergency team of board-certified emergency physicians and experienced emergency nurses supports rural clinicians in the management of critical conditions using sophisticated telehealth technology. The eEmergency team is comprised of twelve physicians and eighteen nurses, supported by an operations team of seventeen clinical and non-clinical staff who support the day-to-day business administration of the program. In addition, the eEmergency team closely partners with the Intensivists, critical care nurses and pharmacists located in Avera's comprehensive telehealth center, the eHelm, as well as clinicians at Avera's tertiary care facility, Avera McKennan Hospital & University Health Center. The eEmergency team was actively engaged in the design and implementation of the eEmergency service, and their dedication to building relationships with and supporting rural clinicians has been integral to program success.

The Avera eCARE model

The Avera eCARE model is unique in that it was created by rural clinicians for rural health. During their eCARE shift, clinicians see only eHealth patients, and are attuned to the specific needs of rural facilities. This creates entirely new access to specialty care. Avera's vision for innovative adoption of technology to enhance access to needed specialty services began in 1993 with Avera eConsult, the first formal telehealth program in the area. In

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2004, Avera expanded its telehealth platform to include Avera eICU CARE™ and in 2009, Avera's innovative vision grew to include eEmergency and ePharmacy services.

Today, Avera's suite of services, collectively called Avera eCARE, includes:
- eConsult;
- eICU;
- eEmergency;
- ePharmacy;
- eLTC; and
- eAccess (urgent care).

Avera boasts one of the largest telehealth networks in the United States, and the first telehealth network to collocate services in one space, the eHelm. This strategy allows the eHelm to enhance access to a broad spectrum of specialist services, and support improved continuity of care across the continuum, while serving as an incubator for clinical innovation.

After months of planning, Avera implemented eEmergency in October 2009, as a 24 month, eight-site pilot program. Innovation in the design of Avera eEmergency came from engaging rural clinicians and administrators in building the program from the ground up, ensuring their needs were understood and met. Then, using off-the-shelf components, the IT team focused on ease of use and reliability while hub clinicians defined their roles to assist, not replace, the rural staff. This innovative line of thinking recognizes the needs not met by the current health paradigm and reimbursement scheme can be met by wrapping a virtual multidisciplinary team around the rural facility to fill gaps in care. The eEmergency footprint continues to grow.

Today, eEmergency covers a 495,000 square foot service area **(eEmergency Site List)**, reaching eighty hospitals across South Dakota, Minnesota, North Dakota, Iowa, Nebraska, Wyoming and Montana. Through eEmergency, two million rural residents now have local access to the resources of a Level II Trauma Center. eEmergency uses two-way high-definition video, electronic medical records and a dedicated, round-the-clock team to virtually assist rural emergency providers and nurses with patient care, documentation and transfers. The system is always live and ready for use. A key component of eEmergency success is the ease of activation. With the press of one button, rural staff is connected to the eEmergency hub within seconds.

A number of sites also have adopted additional technologies including telehealth stethoscopes and examination cameras. These ancillary devices allow the hub physician to hear heart and lung sounds as if present in the room or get a close-up image of a wound. eEmergency interactions are also enhanced by the use of video laryngoscopes and point-of-care lab testing to assist virtually with intubations and diagnostic evaluation. Additionally, each eEmergency encounter is tracked in a customized electronic log built on a structured query language (SQL) interface, which enables improved communication with the rural sites, tracking of technical issues, assistance with transfers and data collection for quality improvement.

Timeline
Initial planning for eEmergency began in April 2008. Funding for program start-up was obtained in December 2008, and after months of careful planning, the first pilot sites were implemented in October 2009. The implementation process includes an on-site, information technology assessment, introductory meetings with clinical and administrative leadership, purchasing and installing telehealth equipment, and an on-site training for all bedside staff prior to "go live". The Avera eEmergency team is experienced in telehealth implementation, so is able to coordinate service implementation in several sites at one time, allowing for rapid program growth. Within the first three years of the program, eEmergency expanded from the eight original sites located in the immediate service area to sixty five sites across six states. Today, eEmergency continues to rapidly grow and expand across the upper Midwest.

Results

Avera eEmergency supports rural clinicians in the delivery of highest-quality care; resulting in earlier interventions, improved use of evidence-based medicine, reduced unnecessary transfers, reduced complications and lives saved. Since its inception eEmergency has touched more than 17,000 patients either through video encounters or transfer support. This translates directly into better care, better health outcomes, and reduced costs. More than 7,000 patients have been seen through an eEmergency video encounter and additional 10,000 patient transfers have been coordinated through the service.

In a recent survey, 100 percent of rural clinicians and administrators agreed that eEmergency services are an important part of the delivery of emergency care in rural communities. eEmergency services are designed to facilitate care in both emergent and urgent situations. The eEmergency team is experienced, and readily adapts to meet whatever need the rural facility presents. One of the primary benefits of eEmergency is the expedition of service delivery in rural hospitals. In 27 percent of cases, the eEmergency physician was available prior to the local physician, meaning that the patient received more timely care because of eEmergency. In these cases, the hub physician was available an average of 14 minutes before the local physician. For patients suffering a heart attack or stroke, 14 minutes could mean the difference between life and death. eEmergency has increased the quality of clinical services and enhanced compliance with evidence-based standards in rural hospitals **(eEmergency Outcomes).** In September, 2011, eEmergency introduced a chest pain initiative aimed at improving care for patients presenting to the emergency department with an emergent cardiac condition.

Participating hospitals have demonstrated significant improvements in quality and outcome measures, including:

- An overall ""Median Time to EKG"" of seven minutes. This has decreased by as much as 11 minutes and greatly exceeds the Centers for Medicare & Medicaid Services expectation of 10 minutes.

- A thirty minute reduction in ""Door-In, Door-Out"" time for patients transferring to a primary PCI center.

- 100 percent compliance with American Heart Association and American College of Chest Physicians aspirin administration guidelines. Historically, compliance was as low as 67 percent.

In addition, eEmergency also has impacted the delivery of rural stroke care. Through eEmergency, rural patients receive neurologist-directed stroke care at the time of initial presentation. The intent is to increase appropriate administration of fibrinolytic medication to improve patient outcomes, as well as to enhance rural clinician knowledge and assessment skills. The expert assistance provided by eEmergency has increased t-PA administration rates in the ischemic stroke sample to 25 percent (compared to a national rate of 5 percent), and has resulted in 100 percent of screened and eligible patients receiving fibrinolytic medication.

Cost/Benefit Analysis

eEmergency has an annual operating budget of $3.5 million, with the majority of costs going toward salaries for clinicians and administrative staff. Each eEmergency site requires approximately $24,000 in videoconferencing equipment to implement the program. Additionally, broadband expenses are estimated at $6,000 per year per facility. One of the largest benefits of eEmergency is its ability to keep care close to home. More than 1,000 of the eEmergency encounters (nearly 17 percent) have resulted in an avoided transfer, creating an estimated $7.85 million in transfer savings to patients and payors. This figure takes into account the costs and likelihood of ground versus air transfer for each hospital included in the eEmergency network. For rural facilities, these avoided transfers equate to increased revenues. More than half of all avoided transfer result in a local admission, which means that health care dollars stay in the local facility rather than flowing to urban hospitals. Rural facilities also benefit from the support to the rural workforce. Availability of eEmergency has been linked to the recruitment of physicians as well as to the retention of an aging workforce. The peer support available through Avera eEmergency is thought to reduce physician and nurse burnout, lowering recruitment costs to facilities.

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Advice and Lessons Learned

Two key obstacles in implementing eEmergency have been cost and change management. Funding the equipment needed to operate eEmergency services can be burdensome to small facilities with limited budgets. Avera works with participating sites to secure federal and private grant funds to offset a portion of the cost associated with equipment purchase, enhanced broadband network and service fees. Staff acceptance of a new resource and practice model also can pose challenges, but the eEmergency team addresses these by focusing heavily on relationship development and ongoing collaboration to manage culture change and encourage utilization.

Each new eEmergency site undergoes a face-to-face training where eEmergency staff demonstrates the use of the technology and discusses potential clinical situations in which eEmergency can provide assistance. Subsequent trainings, mock scenarios and educational in-services are provided via the two-way audiovisual technology. The team also views every patient encounter and daily equipment test as an opportunity to form relationships across the camera and promote an atmosphere of collaboration. The eEmergency team also has developed a binder for each local site that contains specific information regarding available resources, providers and staff, so they quickly can become oriented into whatever environment they are welcomed. The emergency hub concept can be replicated by other organizations that are committed to funding the initial start-up expenses, including facilities, hardware, software and staffing, and work on the relationship building that makes this model a success.

Telehealth and other eHealth modalities are becoming more and more accessible to health care organizations of all shapes and sizes. Each year, the costs of the technology and connectivity decline, while the services themselves become more familiar and popular among clinicians. At the same time, the need and demand for these types of services grows. For this reason, Avera eEmergency is a highly replicable model with a high likelihood of producing similar results in other geographies. This statement is supported by the host of studies demonstrating the positive impact of other telehealth services on increasing access, improving quality and decreasing cost of care. While these other programs are smaller in scope than Avera eEmergency, they underscore the potential for large-scale replication and deployment. As health care continues to focus on achieving the three-part aim and on improving care coordination for all of our patients, there is increased impetus for programs like Avera eEmergency that affordably leverage the advantages of urban health care to meet the needs of rural patients and provide a rural health care safety net.

Sustainability

Creating a sustainable, replicable model has been an objective of the eEmergency project from its inception. Avera provided significant start-up funding for Avera eEmergency. In addition, Federal and private grant funds have offset operational and equipment costs to support the implementation and growth of Avera eEmergency. The ongoing operating costs of Avera eEmergency are covered by monthly services fees paid by facilities receiving services. To ensure a viable and sustainable model, the strategic planning group set a goal to grow eEmergency to 60 sites in 60 communities within a 36-month timeframe. To achieve sustainability, Avera worked beyond its established 29-hospital footprint to collaborate with other health systems in the region. To date, Avera has achieved sustainability with the eEmergency model, and is currently providing services in 80 facilities across a seven state region. Through secure networks connecting the non-system sites, the organization is able to focus expansion on rural hospitals that have a significant need for eEmergency services.

Tools to Download
- **eEmergency Quick Sheet**
- **eEmergency Site List**
- **eEmergency Outcomes**

*e*Emergency **QUICK** SHEET

*e*Emergency—part of **Avera *e*CARE™,** the suite of innovative technology applications that improve patient safety and support the rural health care workforce

e*Emergency is an innovative concept that links two-way video equipment in local rural emergency rooms to emergency-trained physicians and specialists at a central hub, 24 hours a day, seven days a week.

The **e*Emergency** team ensures immediate access to physician-rendered emergency care and also supports the local physician and care providers through access to consults on request.

e*Emergency supports patient care by:
- Providing the availability of physician-rendered emergency care 24 hours a day, regardless of location
- Streamlining access to neurologists and other specialists for better outcomes for patients with trauma, stroke, sepsis, acute myocardial infarction and other critical care issues
- Supporting activation of emergency transport teams as early as possible, saving seconds during the golden hour
- Providing support when the local facility experiences multiple emergency cases at the same time
- Reducing unnecessary transfers, resulting in greater patient satisfaction
- Assuring patients' families access to a specialty consultation at home

e*Emergency supports rural providers by:
- Offering a peer consultation
- Accessing transfer support and coordination with just a single call
- Reducing care delays caused by offsite call and inclement weather
- Initiating diagnostic tests before the local physician arrives
- Easing isolation for rural physicians
- Giving immediate support to the local care team in a crisis
- Creating a network of emergency-trained and specialist support

e*Emergency supports rural facilities by:
- Reducing unnecessary transfers, resulting in increased local revenue
- Generating reimbursement through better documentation
- Decreasing expenditures for hiring locum tenens
- Boosting rural provider life balance, thereby aiding in recruitment and retention
- Supporting facilities to achieve and maintain trauma-level designations
- Offering ongoing training in technology use and emergency-medicine protocols to keep staff comfortable and up-to-date

Avera*e*CARE™

Avera *e*EMERGENCY
Sites

4.1.13

MT

ND

MN

WY

SD

NE

IA

17

28

2
2

22

9

5
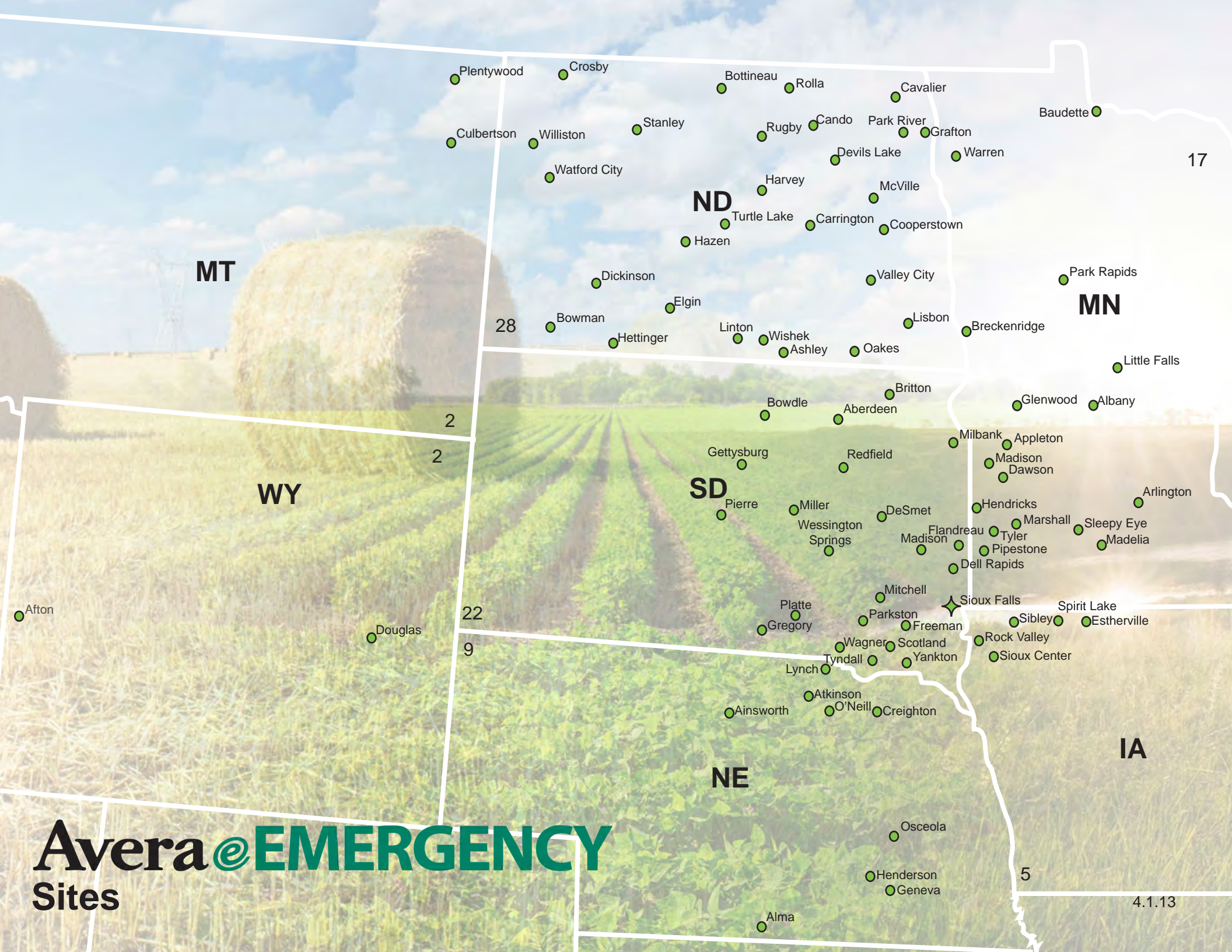
Plentywood
Crosby
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Cavalier
Baudette
Culbertson
Williston
Stanley
Rugby
Cando
Park River
Grafton
Watford City
Devils Lake
Warren
Harvey
McVille
Turtle Lake
Carrington
Cooperstown
Hazen
Valley City
Park Rapids
Dickinson
Elgin
Lisbon
Breckenridge
Bowman
Linton
Wishek
Little Falls
Hettinger
Ashley
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Britton
Glenwood
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Tyler
Madelia
Madison
Pipestone
Dell Rapids
Mitchell
Sioux Falls
Spirit Lake
Platte
Parkston
Sibley
Estherville
Gregory
Freeman
Rock Valley
Wagner
Scotland
Afton
Tyndall
Yankton
Sioux Center
Lynch
Douglas
Atkinson
Ainsworth
O'Neill
Creighton
Osceola
Henderson
Geneva
Alma

Avera *e*EMERGENCY Outcomes

Avera *e*Emergency supports rural clinicians in the delivery of highest-quality care, resulting in earlier interventions, improved use of evidence-based medicine, reduced transfers, and lives saved.
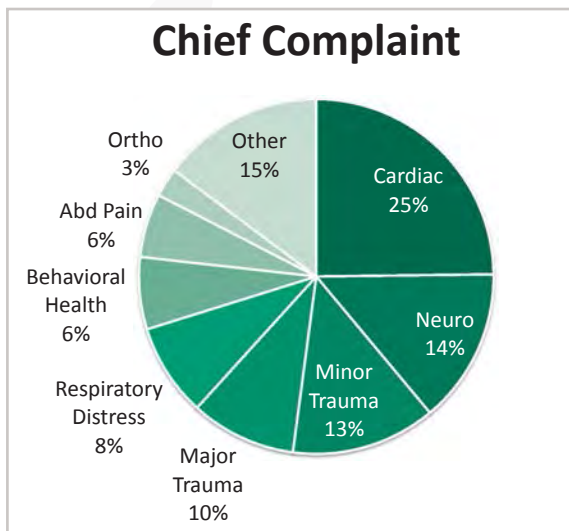
Since 2009, *e*Emergency has grown to serve hospitals across 362,000 sq. miles and six states. Some 1 million residents have local access to the resources of a Level II Trauma Center for the first time.

In a recent survey, 100% of rural clinicians agreed that *e*Emergency is an important part of emergency care in rural communities.

The *e*Emergency team is experienced, and readily adapts to meet whatever need the rural facility presents. One of the primary benefits of *e*Emergency is the expedition of service delivery in rural hospitals. In 25 percent of cases, the *e*Emergency physician was available prior to the local physician, meaning that the patient received more timely care because of *e*Emergency. In these cases, the hub physician was available an average of 19 minutes before the local physician. For patients suffering a heart attack or stroke, 19 minutes could make a significant impact health outcomes.
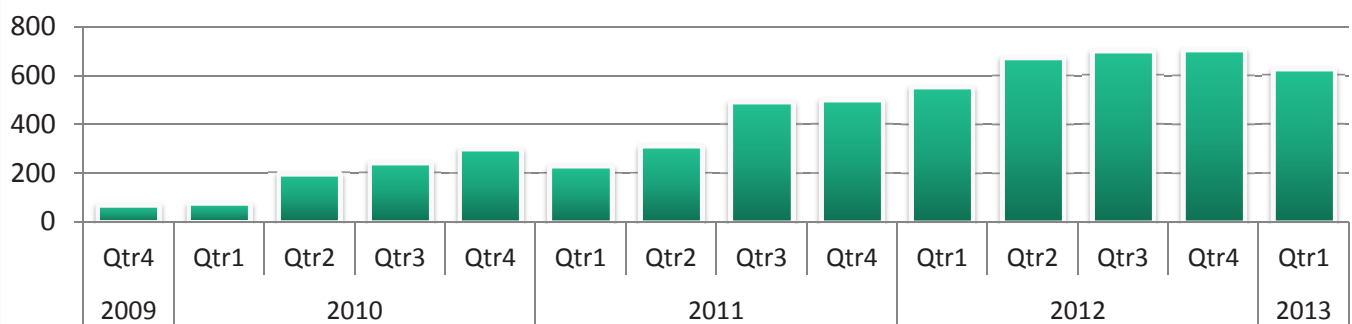
Rural facilities also benefit from the support to the rural workforce. Availability of *e*Emergency has been linked to the recruitment of physicians as well as to the retention of an aging workforce. The peer support available through Avera *e*CARE services are thought to reduce physician and nurse burnout, lowering recruitment costs to facilities.

By the Numbers

April 2013

- 76 sites live
- 5,650 patients treated
- 10,500 transfers arranged
- 975 transfers avoided
- $7.8 million saved

www.avera.org/ecare

Chief Complaint

Pie chart: Cardiac 25%, Neuro 14%, Minor Trauma 13%, Major Trauma 10%, Respiratory Distress 8%, Behavioral Health 6%, Abd Pain 6%, Ortho 3%, Other 15%

eEmergency Encounters by Quarter

Bar chart of eEmergency Encounters by Quarter: Qtr4 2009; Qtr1, Qtr2, Qtr3, Qtr4 2010; Qtr1, Qtr2, Qtr3, Qtr4 2011; Qtr1, Qtr2, Qtr3, Qtr4 2012; Qtr1 2013

Avera *e*EMERGENCY Chest Pain Initiative

Chest Pain Initiative

Mortality for patients experiencing heart attack is directly related to timeliness of treatment. An article published in the *Journal of the American Medical Association* stated that "compared with non-CAHs, CAHs had <u>fewer</u> clinical capabilities, <u>worse</u> measured processes of care, and <u>higher</u> mortality rates for patients with AMI, CHF or pneumonia."

Additionally, 25% of patients seen through eEmergency present with a cardiac complaint. Taken together, these facts compelled the team to place a greater focus on cardiac care.

The goals of the Initiative include facilitating the consistent delivery of evidence-based care across *e*Emergency, and measuring the impact of *e*Emergency on the delivery of care.

- 30 Participating Sites
- Nearly 500 Encounters
- 51 Transfers Avoided
- $127,500 Transfer Costs Avoided

How the Program Works

In participating facilities, *e*Emergency is activated for any patient presenting with chest pain. The eEmergency team assists with whatever is needed. The *e*Emergency RN documents key quality data in real time. Data is compiled and shared to promote sharing of best practices.

Background

More than 1.1 million patients are diagnosed with cardiovascular disease each year.

CVD is the leading cause of death in the United States, affecting more people than trauma, cancer and chronic respiratory disease combined.

Every minute, someone will die of a coronary event.

www.avera.org/ecare

Results

- A statistically significant improvement in median time to ECG from 12 minutes to 8 minutes.
- 100% compliance with aspirin administration. Patients were 2.19 times as likely to receive aspirin.
- An 18 minute improvement in door to t-PA for eligible patients
- A 36 minute improvement in mean door-in, door-out time (time to transfer)

Time To Transfer — Line chart showing System and eEmergency time to transfer from 2007 to 2012.
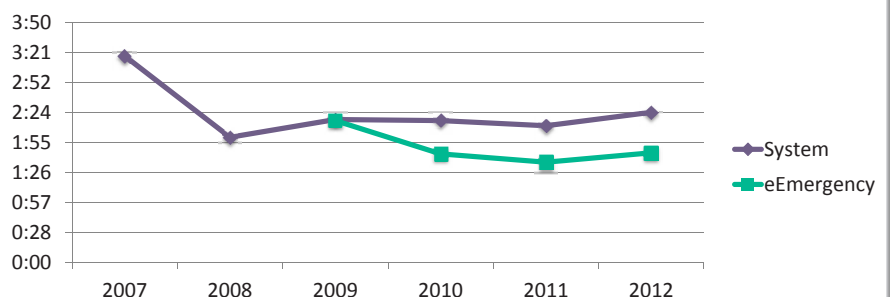
Avera *e*EMERGENCY Patient Experience

The Jason Semmler Story:
All the Difference in the World

The last thing Jason Semmler of Parkston, S.D., remembers about the day he gathered pregame with coaching friends is watery eyes and being taken to the car. Dr. Jason W. Wickersham, who met him in the Emergency Room (ER) at Avera St. Benedict Hospital remembers classic stroke-like symptoms. Jason was lethargic, poorly communicative and had bilateral weakness that was more pronounced on the right side.

Dr. Wickersham explains that in the more than seven years that he has practiced in rural Parkston, no one ever met the criteria for clot-busting thrombolytic therapy, but because of the quick action on the part of Jason's friends and wife, Julie, Jason was in the ER within 30 to 45 minutes of symptom onset.

While Dr. Wickersham assessed Jason, Lindsay Weber, CNP, pressed the red button on the ER wall, activating Avera's *e*Emergency service at the hub at Avera McKennan Hospital & University Health Center in Sioux Falls. The *e*Emergency team quickly implemented *e*Stroke services, bringing in on-call Neurologist Karen Garnaas of Neurology Associates.

"I was able to examine the patient over the monitor and get the history first-hand from his wife and brother. I also had an opportunity to look at his CT scan … all of his labs. Most importantly I was able to discuss with them the pros and cons of proceeding with thrombolytic therapy." The treatment is very helpful, but carries risks, explains Dr. Garnaas, emphasizing the importance of administering it to the right patient at the right time.

Working with Dr. Garnaas over the eEmergency system, Dr. Wicker-

sham administered the therapy. The *e*Emergency team arranged for transport, and Jason was airlifted to Sioux Falls with Julie, who explains how quickly they were met there by Dr. Garnaas. Through the *e*Emergency service she had remained completely up-to-date on Jason's condition.

Dr. Garnaas notes, "He had a beautiful response to the thrombolytic therapy. By the time he hit our ICU he was alert, following commands and had just minimal weakness left on one side. … This face-to-face made all the difference in the world," she adds noting that the real-time consult with the Parkston team made her job a lot easier.
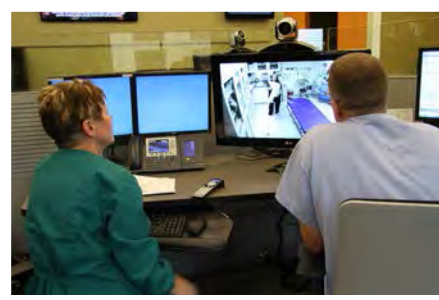
Physicians learned that Jason's stroke was the result of a heart defect. Jason later underwent surgery to correct the problem and is back on the sidelines in Parkston once again.