pulsara®

SYSTEMS OF CARE THAT SCALE

Pulsara is the communications and logistics platform that unites distributed teams and fragmented technologies as dynamic events evolve. From the routine STEMI or stroke to the full-blown multiple patient incident, Pulsara connects the right teams at the right time on one scalable platform.

The data included in this deck represents a sampling of the accomplishments of some of our customers who have used the platform for their inter- and intra-organization patient care coordination needs and have tracked the impacts of the streamlined and flexible communication Pulsara enables.

Our customers' ability to communicate seamlessly from initial assessment to definitive care has yielded reductions in average treatment times between 22% and 68%. If your organization is interested in a specific use case not reflected here, be sure to reach out to us for a reference!

IT'S ABOUT PEOPLE

pulsara®

Ambulance Victoria and Bendigo Health Hospital

Melbourne, Australia

Improving acute cardiac and stroke treatment times by streamlining multi-disciplinary communication

THE FLOREY · MONASH University · BENDIGO HEALTH

Bagot KL,[1,2] Bladin CF,[1,2] Bernard S,[3] Vu M,[3] Smith K,[3] Budge M,[4] Nadurata V,[4] & Cadilhac DA[1,2]

Background

- Rapid treatment of patients with suspected acute stroke or cardiac events involves pre-hospital (paramedics) and hospital clinicians from multiple departments including: emergency, medical, neurology or cardiology, radiology or catheterisation laboratory.
- Clinicians repeat patient details using multiple communication methods (phone, fax, pager, face-to-face) and record details in various systems (Figure 1).
- Inefficient communication may contribute to treatment delays for these time-critical conditions.

Figure 1: Pre-Pulsara® communication flow

Aim

To determine if a smartphone communication app improves management timelines for patients with suspected acute stroke or cardiac events.

Methods

- A pilot study with a 6 month pre-post historical control design was used. Participants were patients with a suspected acute stroke or cardiac event in a Victorian regional hospital and 11 Ambulance Victoria (AV) branches.
- The Pulsara® Stop Stroke™/STEMI™ smartphone app (Pulsara www.pulsara.com) was deployed to paramedics, and hospital clinicians and departments. Pulsara® is designed for secure, two-way, real-time communication with all personnel receiving the same information simultaneously (Figure 2), including photos (e.g., drivers licence for pre-registration, medication lists; Figure 3), estimated time of arrival and case summary post-treatment delivery.
- Clinical care process times (hospital arrival, assessment, treatment) were captured from usual AV and hospital systems.

Figure 2: Pulsara® communication flow

Figure 3: Pulsara app screen shots: a) select patient condition, b) enter patient symptoms, c) adding images (e.g., drivers licence) or messages, d) alert ED.

Results

- Pulsara was activated by AV (n=45) and Hospital (n=23).
- Cohorts were similar for suspected stroke (pre/post: n=107/176 patients; median age 80/77 years; 49%/48% male) but an older, fewer male suspected cardiac pre cohort (pre/post: n=11/24 patients; median 71/60 years; 67%/79% male).
- Median minutes and interquartile ranges reported.

✓ Faster AV metrics when Pulsara used:

- Hospital arrival to triage time 2 & 3 minutes faster, p<.002
  STEMI: pre n=11, 5 mins (2,7), post n=14, 3mins (2,4)
  Stroke: pre n=28, 7 mins (4,14), post n=42, 4 mins (2,7)
- Hospital arrival to off-stretcher 5 & 8 minutes faster, p<.01
  STEMI: pre n=11, 12 mins (7,35), post n=14, 7 mins (4,12)
  Stroke: pre n=28, 20 mins (13,31), post n=42, 12 mins (4,14)
- Hospital arrival to departure 10 minutes faster, p=.006
  Stroke: pre n=28, 55 mins (44,62), post n=42, 45 mins (35,52)

✓ Reduced times for hospital processes recorded:

- Stroke door-to-CT completed 23 minutes faster, p=.00
  pre n=48, 46 mins (28,76), post n=33, 23 mins (16,40)
- Stroke door-to-needle times 33 minutes faster, p=.02
  pre n=5, 111 mins (84,113), post: n=9, 78 mins (61,91); more patients <60 minutes: pre 0/5 (0%), post 2/8 (25%)
- STEMI Door-to-balloon times faster by 28 minutes compared to VCOR hospitals with pre-notification n=717, 55 mins (40,76), Pulsara n=5, 27 mins (26,31)

Conclusion

- The Pulsara® app was implemented for the first time outside of America, and was well - utilised by paramedics and hospital clinicians.
- Pilot results indicated faster timelines for the delivery of care to patients with acute stroke or acute cardiac events. These changes improved AV and hospital metrics.
- A 12-month trial is now underway involving two regional hospitals in Victoria and 25 AV branches.

Affiliations: [1]The Florey Institute of N… [2]Monash University, [3]Ambulance Victoria, [4]Bendigo Health.
Acknowledgements: We would like t… Managers for Ambulance Victoria, Loddon Mallee Region for implementatio…
Funded & supported by: The Heart…

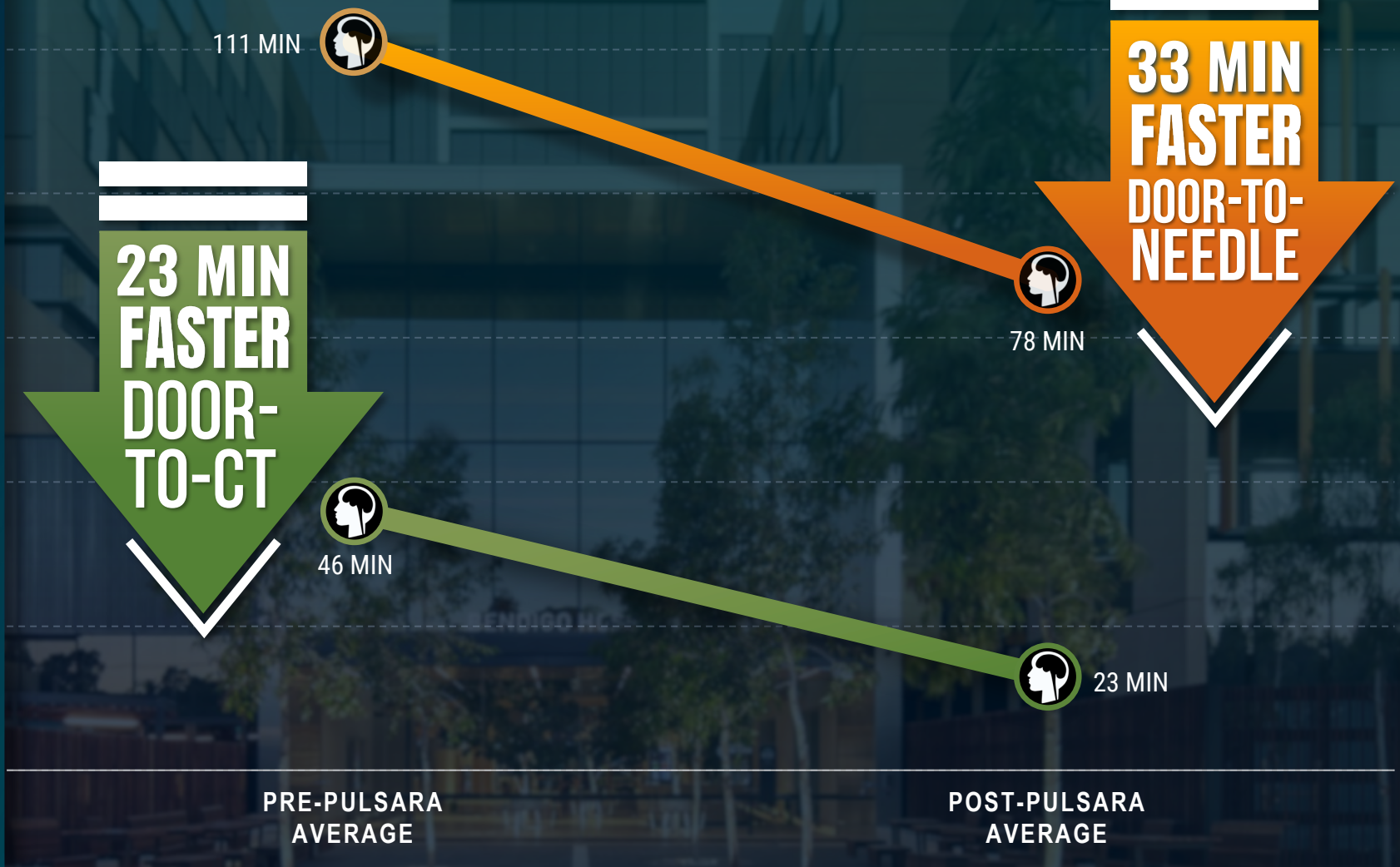
Contact: kathleen.bagot@florey.edu.au

VIEW STUDY

STROKE

TIME TO TREATMENT

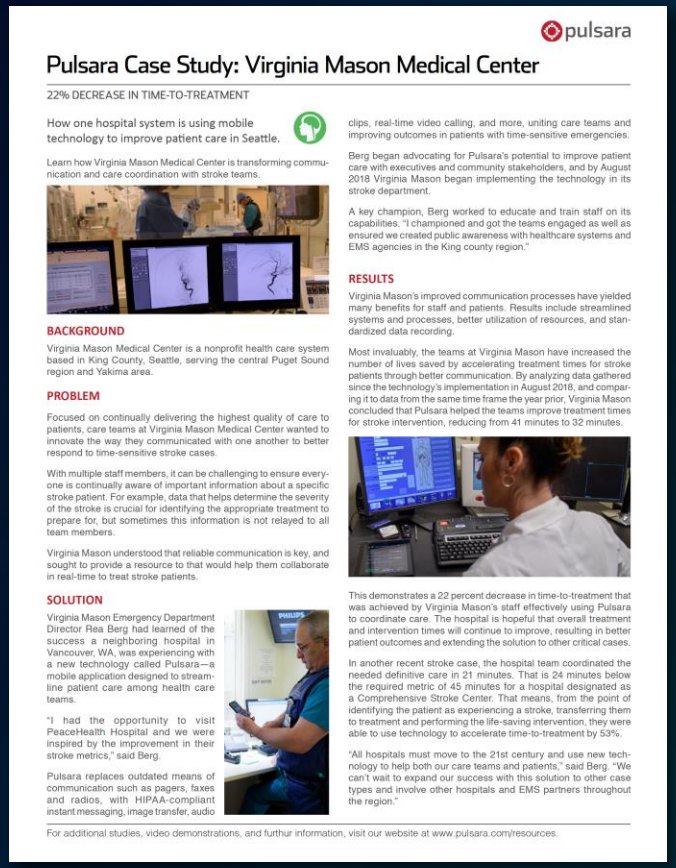
Improvement In DTN and DTCT Times



pulsara

Virginia Mason Medical Center

Seattle, Washington



pulsara

Pulsara Case Study: Virginia Mason Medical Center

22% DECREASE IN TIME-TO-TREATMENT

How one hospital system is using mobile technology to improve patient care in Seattle.

Learn how Virginia Mason Medical Center is transforming communication and care coordination with stroke teams.

BACKGROUND

Virginia Mason Medical Center is a nonprofit health care system based in King County, Seattle, serving the central Puget Sound region and Yakima area.

PROBLEM

Focused on continually delivering the highest quality of care to patients, care teams at Virginia Mason Medical Center wanted to innovate the way they communicated with one another to better respond to time-sensitive stroke cases.

With multiple staff members, it can be challenging to ensure everyone is continually aware of important information about a specific stroke patient. For example, data that helps determine the severity of the stroke is crucial for identifying the appropriate treatment to prepare for, but sometimes this information is not relayed to all team members.

Virginia Mason understood that reliable communication is key, and sought to provide a resource to that would help them collaborate in real-time to treat stroke patients.

SOLUTION

Virginia Mason Emergency Department Director Rea Berg had learned of the success a neighboring hospital in Vancouver, WA, was experiencing with a new technology called Pulsara—a mobile application designed to streamline patient care among health care teams.

"I had the opportunity to visit PeaceHealth Hospital and we were inspired by the improvement in their stroke metrics," said Berg.

Pulsara replaces outdated means of communication such as pagers, faxes and radios, with HIPAA-compliant instant messaging, image transfer, audio clips, real-time video calling, and more, uniting care teams and improving outcomes in patients with time-sensitive emergencies.

Berg began advocating for Pulsara's potential to improve patient care with executives and community stakeholders, and by August 2018 Virginia Mason began implementing the technology in its stroke department.

A key champion, Berg worked to educate and train staff on its capabilities. "I championed and got the teams engaged as well as ensured we created public awareness with healthcare systems and EMS agencies in the King county region."

RESULTS

Virginia Mason's improved communication processes have yielded many benefits for staff and patients. Results include streamlined systems and processes, better utilization of resources, and standardized data recording.

Most invaluably, the teams at Virginia Mason have increased the number of lives saved by accelerating treatment times for stroke patients through better communication. By analyzing data gathered since the technology's implementation in August 2018, and comparing it to data from the same time frame the year prior, Virginia Mason concluded that Pulsara helped the teams improve treatment times for stroke intervention, reducing from 41 minutes to 32 minutes.

This demonstrates a 22 percent decrease in time-to-treatment that was achieved by Virginia Mason's staff effectively using Pulsara to coordinate care. The hospital is hopeful that overall treatment and intervention times will continue to improve, resulting in better patient outcomes and extending the solution to other critical cases.

In another recent stroke case, the hospital team coordinated the needed definitive care in 21 minutes. That is 24 minutes below the required metric of 45 minutes for a hospital designated as a Comprehensive Stroke Center. That means, from the point of identifying the patient as experiencing a stroke, transferring them to treatment and performing the life-saving intervention, they were able to use technology to accelerate time-to-treatment by 53%.

"All hospitals must move to the 21st century and use new technology to help both our care teams and patients," said Berg. "We can't wait to expand our success with this solution to other case types and involve other hospitals and EMS partners throughout the region."

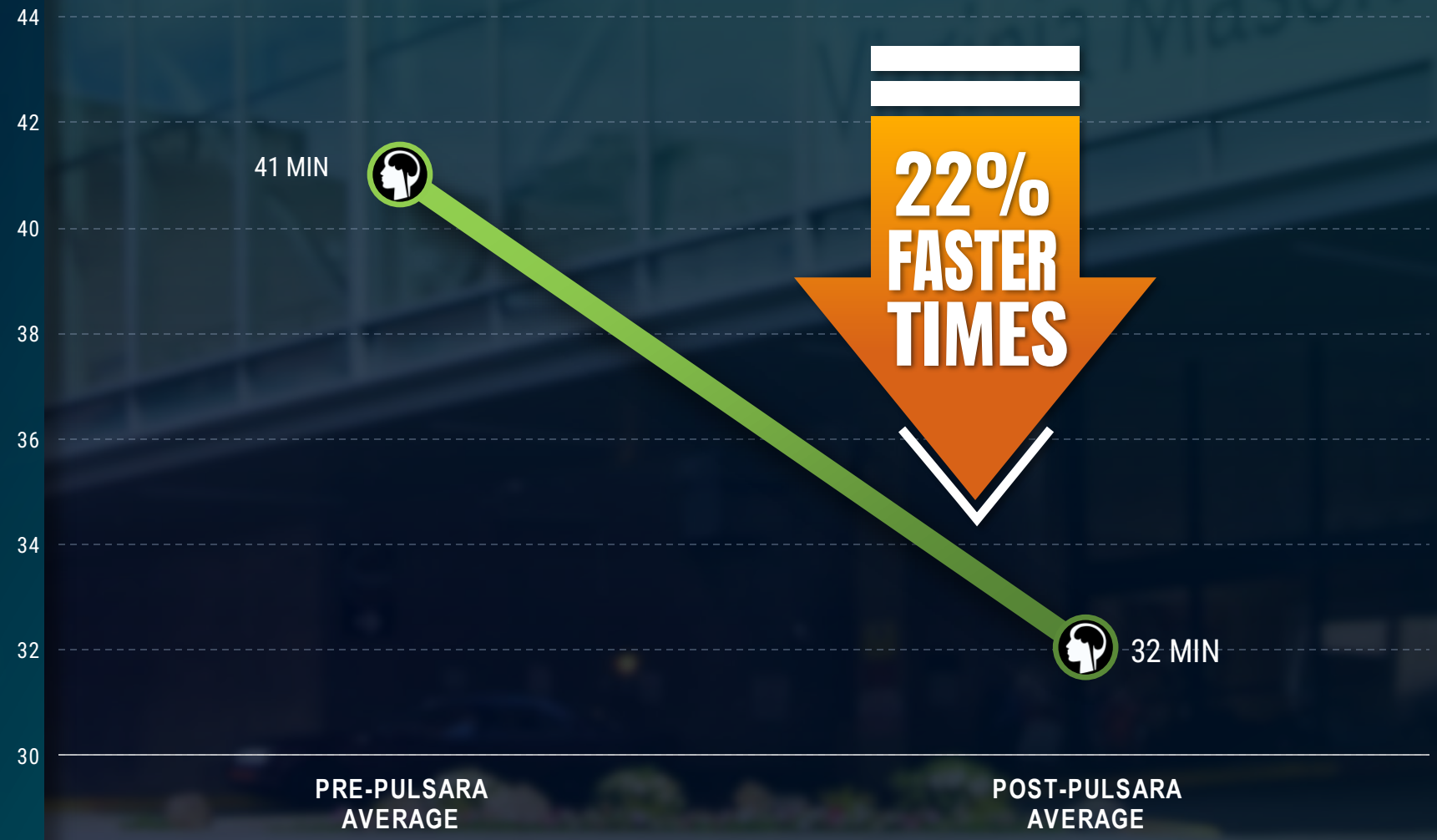
For additional studies, video demonstrations, and furthur information, visit our website at www.pulsara.com/resources.

VIEW STUDY

STROKE

TIME TO TREATMENT

Improvement In Treatment Times



pulsara

EvergreenHealth Medical Center

Seattle, Washington


CASE STUDY

pulsara

EvergreenHealth

Seattle-Area Medical Center Achieves Record Door-to-Puncture Times with Pulsara

THE CHALLENGE

As a two-hospital healthcare system, EvergreenHealth serves a population of nearly 850,000 residents—and over the past few years, their teams and service lines have grown accordingly.

EvergreenHealth's stroke teams were using pagers and audio calls to coordinate care. However, as both the hospitals and the stroke program grew, they began straining the limits of what former standard technologies could support.

"As we were growing the service line, bringing on EvergreenHealth Monroe, considering the freestanding ED, and bringing more neurohospitalists into our program, there was potential for communication to continue to become more fragmented," said RN Nurse Navigator for EvergreenHealth's Stroke Center, Meg Briggs, BSN, RN, SCRN. "You can imagine what it was like with the neurohospitalists spanning three sites, having to keep it all together."

And on top of all the growth, patients' acuity was only getting higher, meaning that more patients required more intensive and time-critical care. "Anything we can do to streamline communication and care with high acuity, that's a win," Briggs explained.

EvergreenHealth

EvergreenHealth is a two-hospital healthcare system and freestanding emergency department in Kirkland, Washington, and is part of a public hospital district serving north King County and south Snohomish County. Their main campus is a 318-bed medical center and Level III Trauma Center located in Kirkland, with a second 72-bed campus in Monroe. EvergreenHealth serves nearly 850,000 residents and offers care in 70 clinical specialties.

KEY RESULTS

- Record low 46-minute door-to-puncture time
- 41% decrease in door-to-puncture time over 1 year
- Improved team communication with photos and messages

Having the ability to instantly message between team members has significantly reduced the amount of time spent

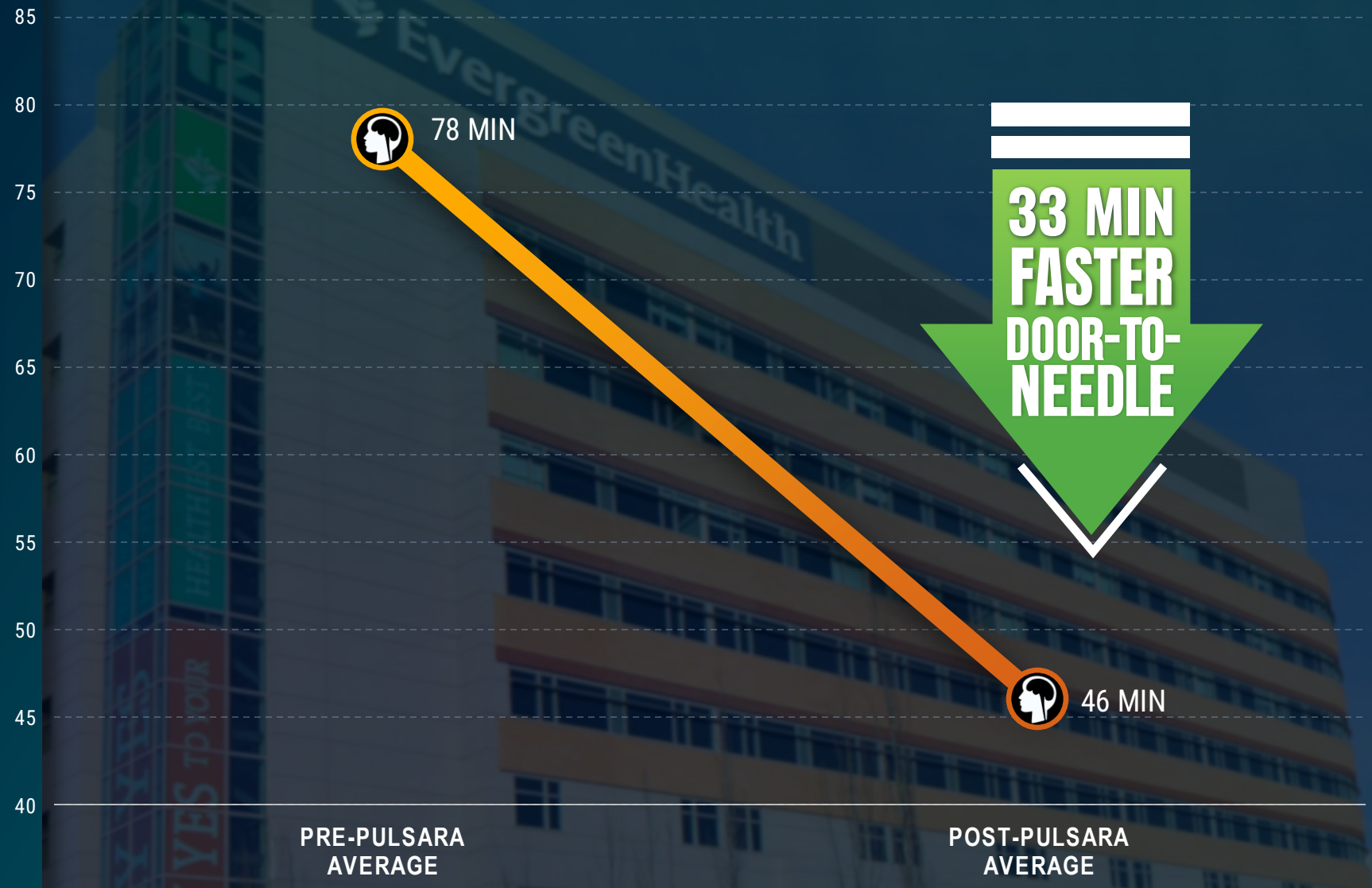
a very intuitive, easy technology—and I'm not super techy. It's about the teamwork. Teamwork improves patient outcomes. Period."

VIEW STUDY

STROKE

TIME TO TREATMENT

Door-to-Puncture Times Improved by 41%



pulsara

Overlake Medical Center

Seattle, Washington


CASE STUDY

pulsara

OVERLAKE MEDICAL CENTER

Facility Cut Stroke Treatment Times by 30 Percent

THE CHALLENGE

As a thrombectomy-capable facility with a large staff of specialists, nurses, and more, Overlake Medical Center sees ~900 acute stroke cases per year. With this volume, providing time-sensitive care is of the utmost importance to producing positive patient outcomes. Overlake knew they needed a streamlined means of communication to help make existing stroke workflows more efficient. "With so many people in the system, unnecessary team members were being alerted for a stroke case, which added extraneous noise as they cared for patients," said Overlake Medical Center's Stroke Team leaders.

For example, the ED would send a page out to all hospital staff, including infusion nurses. This untargeted alert could needlessly pull nurses away from providing much needed IV assistance to other patients. Additionally, team members who were needed, such as neurologists and cath lab specialists, often weren't alerted in real time, since the message came through as a missed phone call or page.

OVERLAKE MEDICAL CENTER & CLINICS

Overlake Medical Center in Bellevue, Washington is a 349-bed hospital serving the Puget Sound region since 1953. The hospital treats more than 245,000 outpatients and 18,000 inpatients each year, and is a Joint Commission-certified Advanced Stroke Center.

KEY RESULTS

- Streamlined HIPAA compliant activations
- Reduced door-to-needle (DTN) times for TPA patients by 31%
- Decreased door-to-groin puncture for LVO patients by 24%
- Coordinated Care Communication

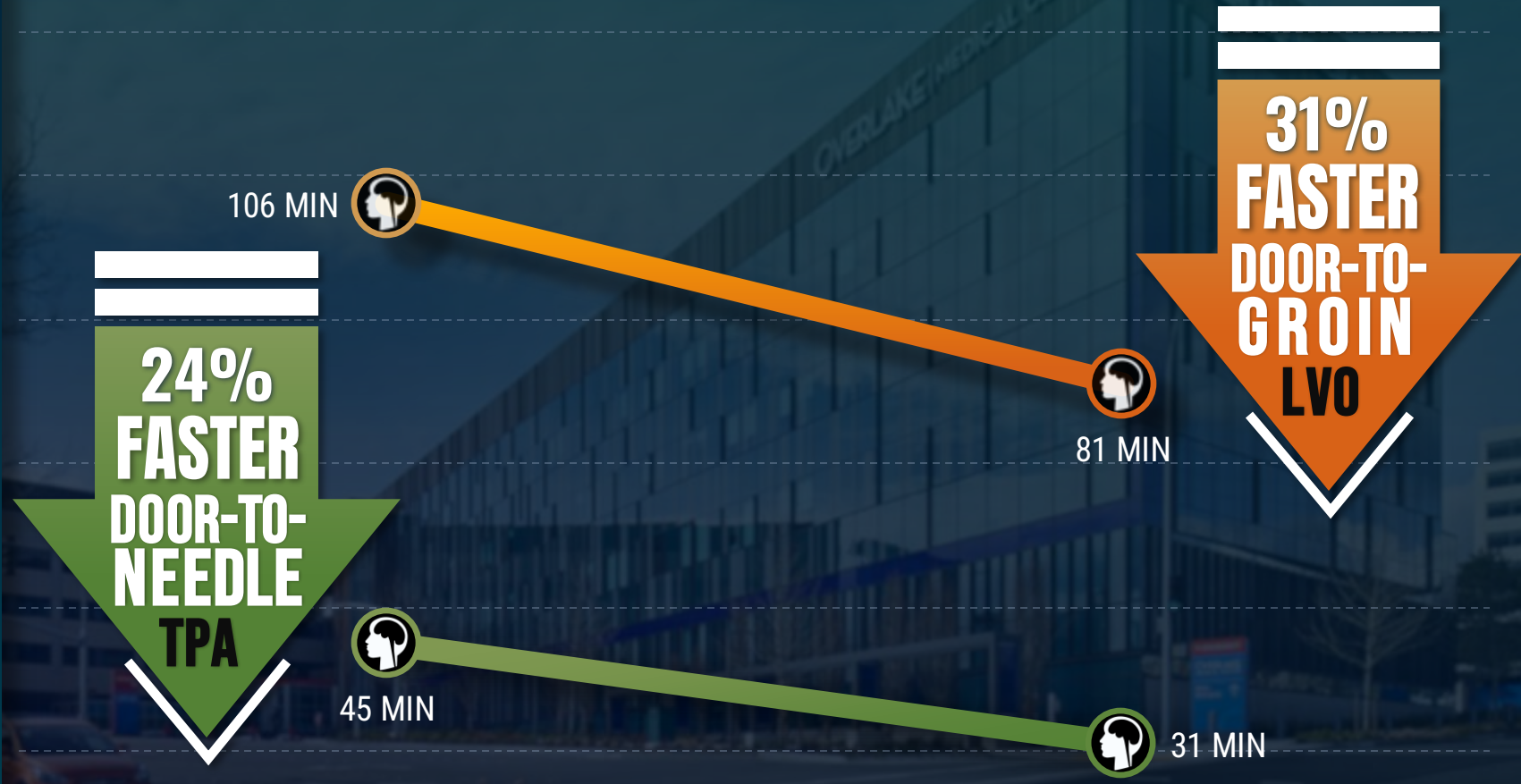
Using Pulsara, Overlake staff connects patients with their families via live video.

VIEW STUDY

STROKE

TIME TO TREATMENT

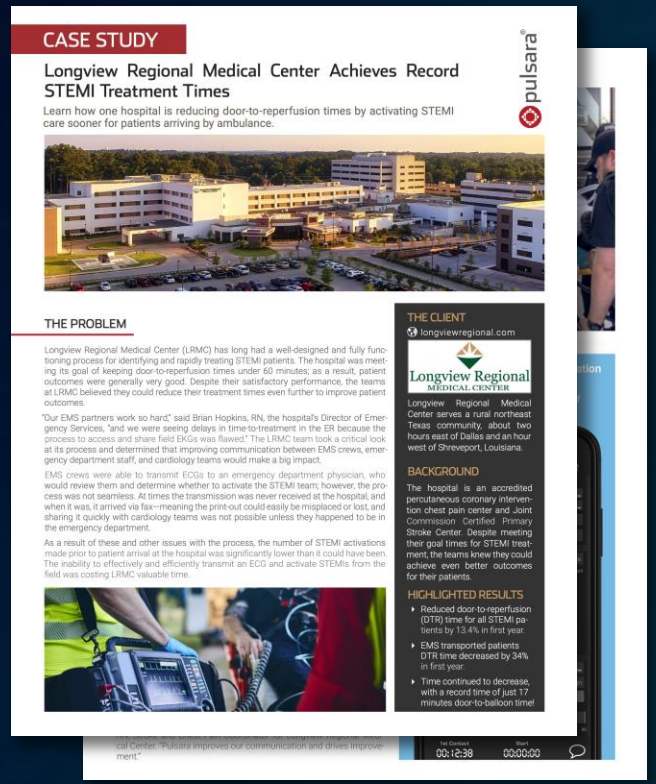
TPA & LVO Treatment Times Improved



pulsara®

Longview Regional Medical Center & Regional EMS Providers

East Texas

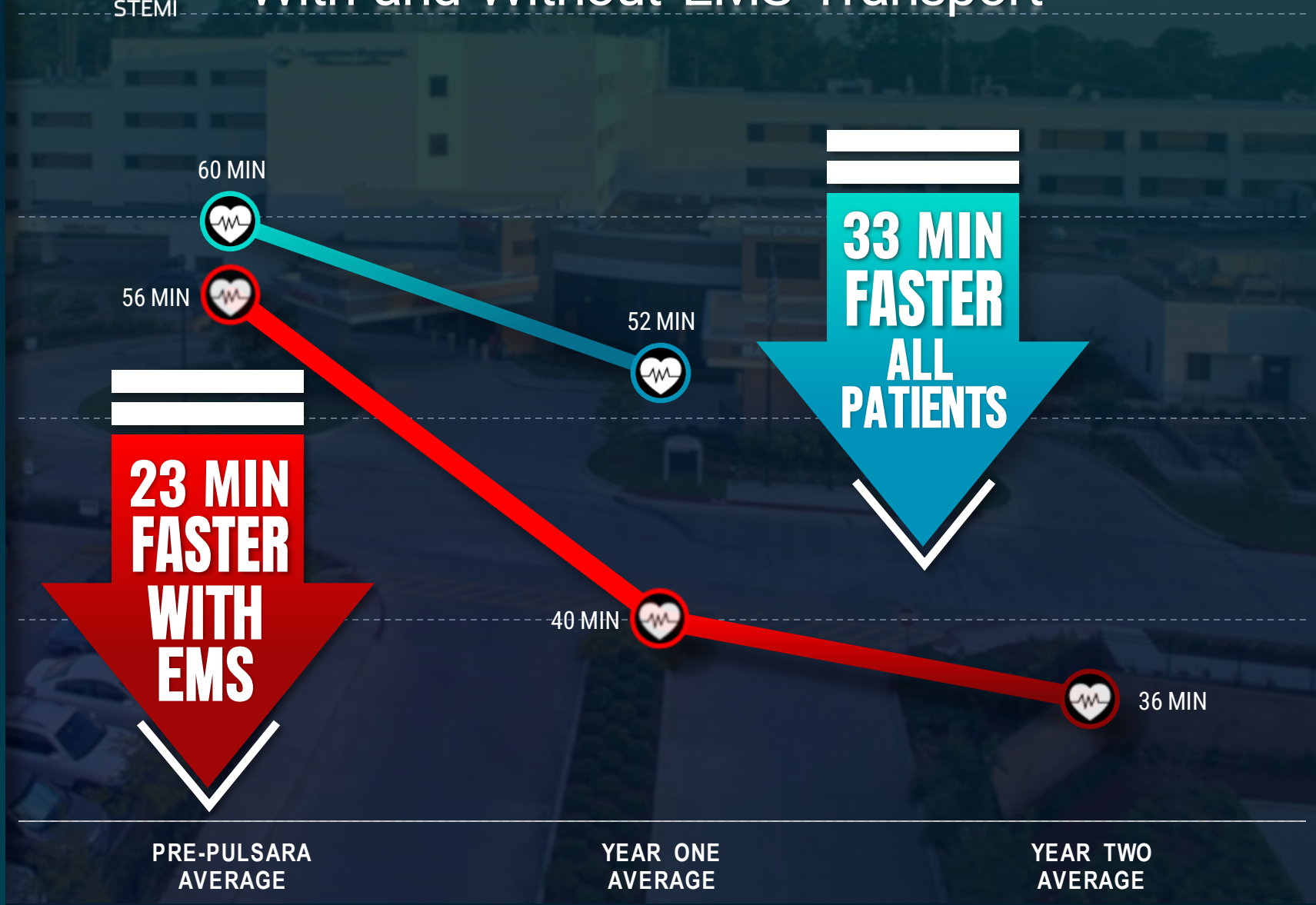


VIEW STUDY

STEMI

DOOR-TO-REPERFUSION

With and Without EMS Transport



pulsara

Cy-Fair EMS & North Cypress Medical Center

Cy-Fair Houston, Texas

pulsara

Pulsara Case Study: Cy-Fair Volunteer Fire Dept

REDUCTION OF CARDIAC TIME-TO-TREATMENT

How one EMS and hospital system worked together to cut door-to-balloon time for STEMI patients.

Cy-Fair Volunteer Fire Department (VFD) in Houston, Texas, implemented a new solution to streamline communication between the field and hospital teams – improving critical care for its STEMI patients.

BACKGROUND

Cy-Fair VFD's EMS division services a bustling 155 square miles of unincorporated Harris County outside of Houston's city limits, one of the nation's fastest growing areas.

PROBLEM

Responding to approximately 25,000 911 calls each year, with over 200 STEMI cases annually, the agency needed a way to better manage communication and improve response. Cy-Fair VFD identified that its performance for cardiac patients was below community standards. Exchange of data between the EMS service and North Cypress Medical Center – a 175-bed hospital covering the Northwest Houston region – was almost non-existent.

To initiate STEMI activations, EMS personnel were calling under the assumption that necessary patient information was being recorded by ED staff. But in reality, status and other important information from the field wasn't being effectively tracked.

Cy-Fair VFD estimated that the door-to-balloon time for STEMI patients was 90 minutes or less for only 60% of cases—well short of their goal of 90%. Both the EMS and hospital sides knew communication and data reporting needed to improve significantly.

SOLUTION

Mark Price, Quality Coordinator for Cy-Fair VFD, and his colleagues were determined to change the way the department activated STEMI cases in the field. After learning of Pulsara at a national EMS leadership conference, the agency approached North Cypress Medical Center about collaborating to improve communication between EMS and the hospital during these critical, time-sensitive cases.

Once activated from any mobile device, Pulsara instantly alerts all members of the critical care team, ensuring that everyone remains updated in real time. The team is notified and ready to go when the patient is, EMS knows whether they are taking the patient to the emergency department or straight to the cath lab, and pre-registration information is provided before arrival – shortening the patient's journey to definitive treatment.

Both hospital and EMS leaders immediately recognized the potential to improve communication and patient care, and they moved forward with testing the platform in November, 2014.

RESULTS

With Pulsara, Cy-Fair's EMS providers were able to provide North Cypress Medical Center's care teams with real-time, accurate patient information, which allowed the hospital to improve coordination and preparation.

By December 2015, just a year after implementing Pulsara, the EMS and hospital teams were achieving 90-minute door-to-balloon time with 85% of STEMI patients – a 25% improvement from 2014.

One of the most successful cases resulted in a record door-to-needle time for a 60-year-old man with a 100 percent occlusion. Using Pulsara, EMS activated the ER, cath lab, and cardiologist simultaneously within four minutes of patient contact. The patient arrived at North Cypress Medical Center just a few minutes later, where the care team performed life-saving interventions immediately, opening the occluded artery just 31 minutes (including an 8 minute transport time) after EMS first arrived at his side.

As a result of the drastic improvement, Cy-Fair received the American Heart Association's Mission: Lifeline EMS Gold Plus Award – a national recognition for EMS agencies that meet high standards of performance.

"Pulsara gave us the opportunity to see where our downfalls were and provide quality improvement to actually address the issues that were there," Price noted.

Additionally, relationships between EMS personnel and hospital staff improved, with the ability to now provide timely feedback throughout the patient journey. Having the feedback loop from Pulsara also led many of the EMS personnel to further educate themselves on the criteria for activating the STEMI team in order to reduce the number of false activations.

Cy-Fair has implemented Pulsara for stroke activation and is testing its use for all patients transported to North Cypress. The department has also begun implementation with a second hospital in the area, Cypress Fairbanks Medical Center – all to ensure continued positive outcomes for its patients.

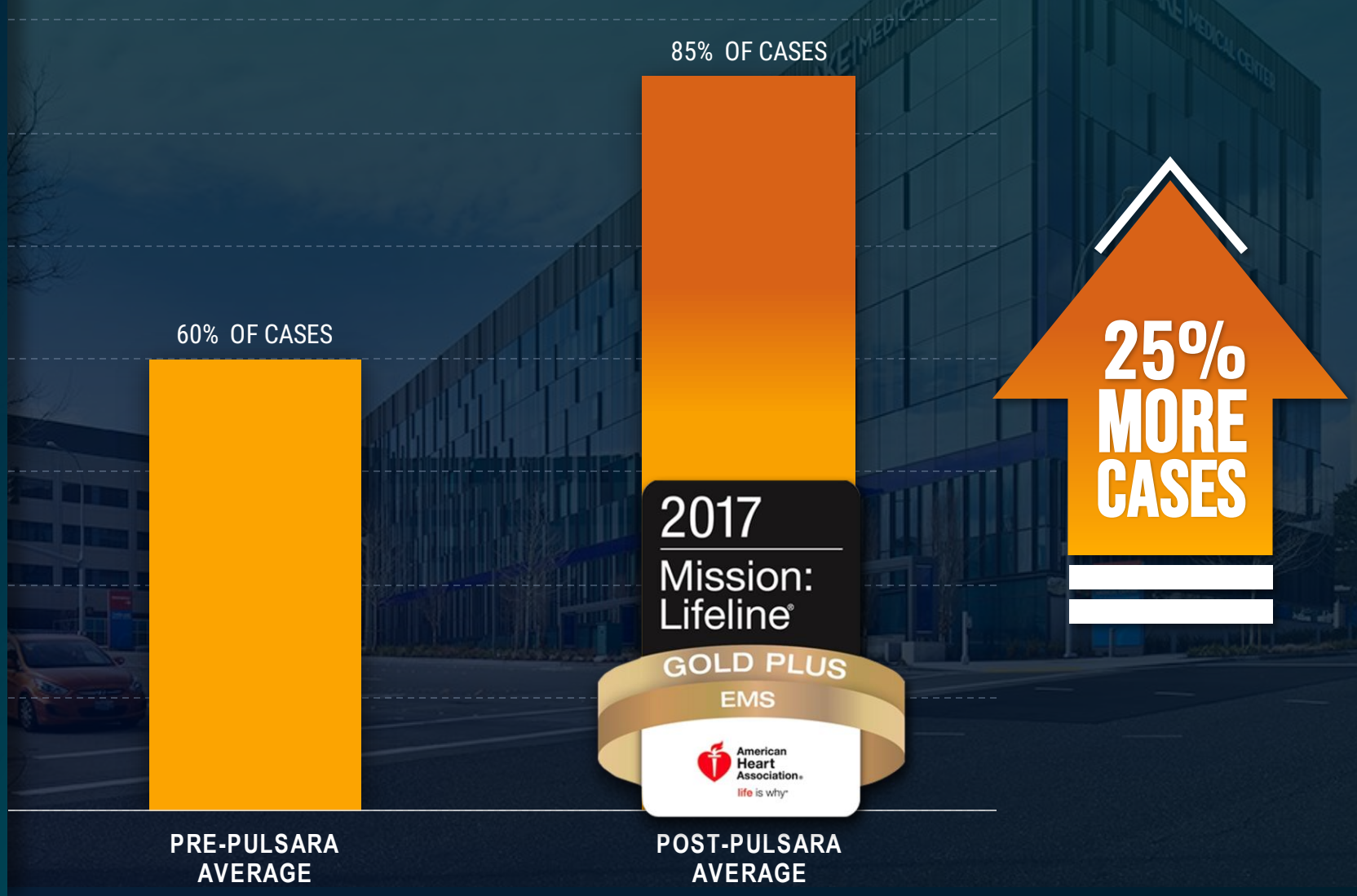
For additional studies, video demonstrations, and furthur information, visit our website at pulsara.com. © Pulsara 2014-2018

VIEW STUDY

STEMI

DOOR-TO-BALLOON TIME

Cases Completed Within 90 Min or Less



pulsara

Saint Mary's Regional Health System & Pope County EMS

Russville, Arkansas

pulsara

Pulsara Case Study: Arkansas Healthcare System

19% DECREASE IN TREATMENT TIMES

Arkansas Healthcare System Uses New Communication Approach to Improve STEMI Patient Outcomes

How a hospital and EMS agency collaborated to decrease average Door-to-Device (DTD) treatment time by 19 percent in four months.

BACKGROUND

Saint Mary's Regional Health System is a Joint-Commission-accredited Level III Trauma Center, located in Russellville, Arkansas. The 170-bed hospital has delivered care to the River Valley community for the past 90 years, and alongside Pope County EMS since 1967.

Saint Mary's and Pope County EMS have a long-standing relationship built on a shared value of putting patients first. As the only hospital and EMS agency serving their region, they together perform emergency response for 28,000 patients annually.

PROBLEM

The healthcare system wanted to improve the critical care process for STEMI patients from start to finish.

With that goal in mind, they identified two areas of opportunity: removing inconsistencies in the communication chain and finding a way to transmit 12-lead ECGs before patient hand-off.

SOLUTION

Knowing how critical efficient response and immediate activation of treatment for heart attack cases are to successful outcomes, the healthcare system realized using outdated technology such as pagers and phone calls would not enable them to meet their goal. It was obvious that a more progressive communication platform was needed.

Pope County EMS Director, Doug Duerr, learned about Pulsara — a mobile technology platform that streamlines patient care by connecting teams across organizations — while attending a state governor's advisory council meeting.

The technology caught his attention because "it was HIPAA-compliant and offered the ability to send 12-lead ECG data straight from the field."

He knew this would benefit both patients and personnel, creating positive strides in communication, quality improvement, patient outcomes, and data reporting. Equally important, it could integrate with hospital counterparts to accelerate the pre-hospital response for STEMI cases and help teams better prepare for patient arrival and appropriate intervention.

Duerr shared Pulsara and its capabilities with his colleagues at Saint Mary's for consideration as a system-wide communication tool for the EMS, emergency department, and cardiology teams.

Saint Mary's Chief Nursing Officer (CNO), Carol Gore, was immediately supportive of the platform's implementation. "It's interactive and allows the entire patient care team to communicate, whether it's EMS to the ED, EMS to the ED and Cath Lab, or to physicians," she said.

By June 2019, the technology was incorporated into the hospital's STEMI activation workflow and processes. While hospital staff education and training were underway, EMS partners were also setting up Pulsara on mobile devices for use in the field.

RESULTS

Saint Mary's and Pope County EMS' successful implementation of Pulsara resulted in a 19 percent improvement for the average STEMI DTD time.

From January to May 2019, 11 patients were treated with a 78-minute DTD time using the former process. After introducing Pulsara, 27 patients were treated with a 63-minute average DTD time from June to September 2019, a 19 percent decrease.

"The impact Pulsara has on timing and allowing cardiology to get the blood vessel opened is huge for our patients," said Gore.

Beyond these impactful time-saving achievements, Saint Mary's and Pope County EMS have seen other benefits from the networked communications Pulsara enables. Now, teams who were once siloed into their own organizations or departments within those organizations are unified around shared information centered on what matters most: the patient.

Motivated by these achievements, the healthcare system is expanding its use of Pulsara with more case types such as stroke, sepsis and trauma — all to expedite critical treatment when even seconds make a difference.

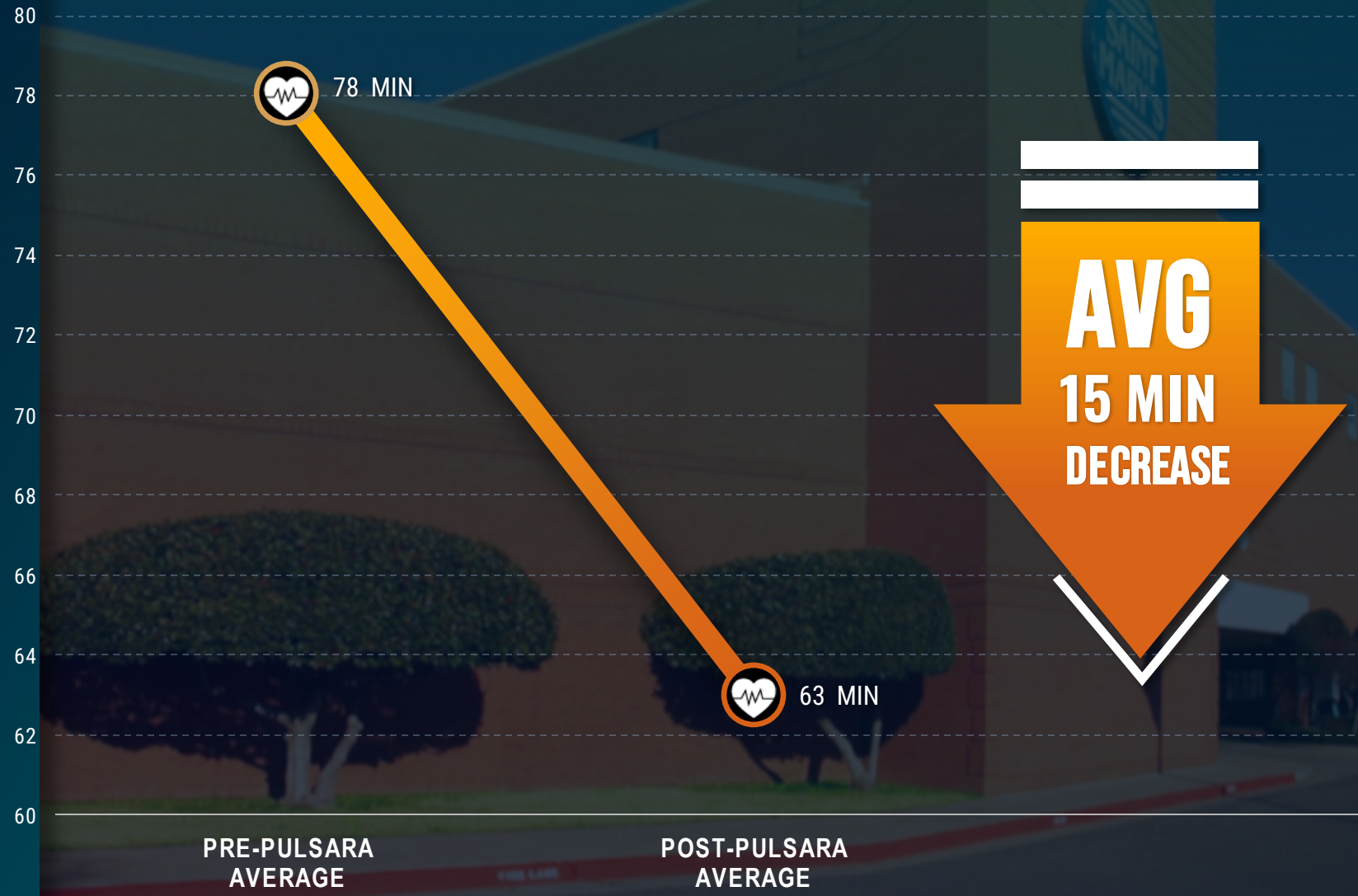
For additional studies, video demonstrations, and further information, visit our website at www.pulsara.com.

VIEW STUDY

STEMI

DOOR-TO-DEVICE TIME

More Cases Completed in Less Time



pulsara

Saline Memorial Hospital

Benton, Arkansas

CASE STUDY

pulsara

SALINE MEMORIAL HOSPITAL

Arkansas Hospital Reduces STEMI Treatment Times by Nearly 30% in Four Months

THE CHALLENGE

With a rapidly growing population and a system running to keep up, Saline Memorial Hospital was looking for a way to reduce their treatment times for patients arriving via EMS. Because it serves a dispersed population and is the only American College of Cardiology Accredited Chest Pain Center in the community, Saline Memorial struggled to keep their first medical contact-to-device times low. The ACC and the AHA recommend a standard of 90 minutes. But, according to Jeannie Otts, RT, R, CV, ARRT, Cardiac Cath Lab Director, Saline Memorial's STEMI patients' first medical contact-to-device time averaged around 105 minutes from the field.

Another issue Otts saw was the lack of a reliable source for ECG transmissions. Whether it was a private or public vehicle, Otts said they "needed a HIPAA-compliant way of transmitting those ECGs and [receiving them]. Our hospital teams wanted to have a one touch activation system and a better way to transmit the ECG communications."

THE SOLUTION

With the hospital teams eager to find an efficient solution, Saline Memorial was more than ready to adopt Pulsara, a people-centric healthcare logistics platform that unites teams via telehealth within and across organizations. With this networked communications app, both EMS and hospitals can streamline care during critical moments, enable clinicians to reduce first medical contact-to-device times, transmit vital ECG information through a HIPAA-compliant

Saline Health System

Saline Memorial Hospital is the only full-service hospital in the rural area of Saline County, Arkansas. Serving over 120,000 people, Saline Memorial is licensed for 177 beds and has its own EMS service (MedTran) that brings in 85 to 90% of their patients. According to Brian Mann, the Saline Memorial Director of Growth and Outreach, Saline County is and has been "one of the fastest growing counties in Arkansas for around a decade."

KEY RESULTS

- Reduced first medical contact-to-device times by 28%
- Efficient, HIPAA-compliant ECG transmission
- Instant feedback features help "close the loop" on cases

© 2021 CommuniCare Technology, d/b/a Pulsara

VIEW STUDY

STEMI

TIME TO TREATMENT

First Medical Contact-to-Device

pulsara

Ouachita County Medical Center

Camden, Arkansas

CASE STUDY

pulsara

OUACHITA COUNTY MEDICAL CENTER

Arkansas Hospital Cuts Their Time-to-Treatment for STEMI Patients by Half

THE CHALLENGE

Previously, when a patient arrived in the OCMC emergency room with a STEMI, whether by ambulance or private car, staff would first page a cardiologist at the patient's preferred receiving facility, then wait for the physician to call back. Only then could they start the process of transferring the patient to a percutaneous coronary intervention (PCI) facility that could provide critical care.

"Then we had to get a bed confirmed, and then we had to wait to get our EMS service to take the patient. And then, usually, most of those patients at that time went to Little Rock, which is about an hour and a half from where we are," explained Jennifer Ray, RN, OCMC's ER and ICU manager. "So the timeliness of the patient getting in and out was very, very slow."

How slow? During 2017, the average door-in, door-out (DIDO) time was 72 minutes for the 19 STEMI patients who came into the OCMC ER—more than double the 30 minutes or less recommended by the American College of Cardiology Foundation and the American Heart Association.

THE SOLUTION

Seeking a way to dramatically, quickly, and cost-effectively improve DIDO times across the state, the Department of Health launched a pilot program in 2018 to implement Pulsara, a mobile healthcare communication program that unites care teams on a single patient channel. OCMC was among the sites chosen for the pilot. The goal, said Ray, was to "facilitate the transfer of these patients from non-PCI hospitals [like OCMC] to PCI hospitals more effectively and in a more timely way."

Gone are the days of making multiple phone calls to coordinate and communicate the arrival, status, and transfer of a patient. With the click of a button, the team at OCMC and the cardiac catheterization lab team at Medical Center of South Arkansas, 30 miles away in El Dorado, are notified.

OCMC Ouachita County Medical Center

Ouachita County Medical Center (OCMC) is a not-for-profit hospital with 99 beds, serving residents of the rural community surrounding the city of Camden in southern Arkansas, about 100 miles from Little Rock. As a smaller, non-PCI facility, OCMC often coordinates transfers for their STEMI patients to PCI facilities.

KEY RESULTS

- 50% decrease in door-in, door-out times for STEMI
- Team notifications for incoming STEMIs
- Streamlined process for STEMI transfers

© 2021 CommuniCare Technology, d/b/a Pulsara

VIEW STUDY

STEMI

DOOR-IN-DOOR-OUT

Faster Treatment Times