Photos courtesy of STRAC

The Evolution of Patient Load Balancing: The Southwest Texas Regional Advisory Council

Regional patient load balancing is an art and science that has evolved across the U.S., particularly over the past few years. ASPR TRACIE interviewed Eric Epley of the Southwest Texas Regional Advisory Council— who was the Council's first official hire in 1998 and currently serves as the executive director/chief executive officer (CEO)—to learn more about how the Council has evolved and promising practices in load balancing and other trauma-related efforts.

The Texas Trauma System was created in 1989 by the Omnibus Rural Healthcare Rescue Act, which directed the state's public health authority "to (1) develop and monitor a statewide emergency medical services (EMS) and trauma care system, (2) designate trauma facilities, and (3) develop and maintain a trauma reporting and analysis system" to, among other things, monitor the system and provide statewide cost and epidemiological statistics (Texas J RAC Advisory Council, 2016; Legislative Reference Library, 1989). The state was divided into 22 regions (i.e., Trauma Service Areas, or TSAs) and Regional Advisory Councils (RACs, which are non-profit and tax-exempt) who develop regional EMS plans, provide related public information, provide a forum for EMS providers and hospitals to discuss TSA issues and network with other RACs, and track related data.

The Southwest Texas Regional Advisory Council (STRAC) was launched in 1993 and:

- Includes the 7th largest city in the U.S. (San Antonio);

- Consists of 74 general and specialty hospitals (39 acute care), including 2 Level I Trauma Centers, 16 PCI centers, 17 Stroke centers, air medical providers, and over 70 EMS agencies; and

- Develops, implements, and maintains the regional trauma and emergency health care system for 3 million people in 22 counties that cover 26,000 square miles and range from the 7th largest city in the U.S. to rural and frontier areas. (Frontier communities have between 12 and 20 persons per square mile.)

STRAC's mission is to "reduce death/disability related to trauma, disaster, and acute illness through implementation of well-planned and coordinated regional emergency response systems." Their vision is to have the "lowest risk-adjusted mortality for emergency healthcare conditions."
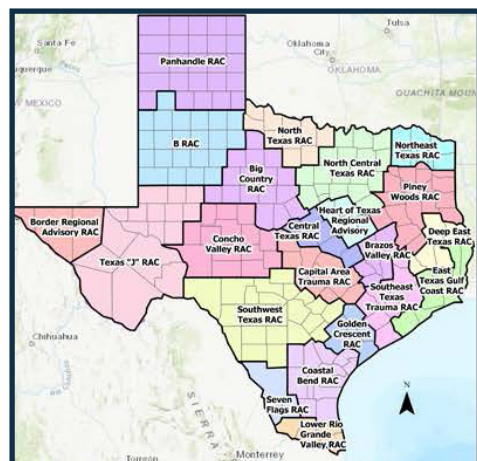

Figure 1: A Regional Map of Texas Trauma Service Areas

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While each RAC is different, the boards are generally comprised of trauma surgeons, nurses, hospital administrators, fire chiefs and paramedics. There is also a requirement for there to be at least one Level 3 designated Trauma Center in each TSA; most TSAs have a Level 2 or Level 1.

▌ John Hick, ASPR TRACIE Senior Editor (JH)

How are communications handled within the region and around the state, and how has this changed over time?

▌ Eric Epley (EE)

Figure 2. A Map of Counties that Comprise STRAC

In 1994 there were three Level 1 Trauma Centers in the region: Wilford Hall Medical Center (run by the U.S. Air Force, and now Wilford Hall Ambulatory Surgical Center) Brooke Army Medical Center (BAMC, run by the U.S. Army), and University Hospital. All three of them went on diversion frequently and trauma patients were getting stranded in rural hospitals.

The county leadership convened a task force to address these challenges. Working as a flight paramedic at the only air medical helicopter agency in the region at that time, I attended the task force meeting with my boss (a retired army colonel), the county judge, hospital chief executive officers, and trauma medical directors to figure this out. Our primary goal at the end of that meeting was that no patient should ever be stranded in south Texas. To achieve this, we agreed we needed a "one call" center with an operator who could track the request and follow up with trauma centers to ensure patients received a destination in a timely manner.

This is when I was assigned to manage what we named "MEDCOM," which was created to serve as a call center and handle patient transfers to one of the three trauma centers following the agreed-upon distribution plan. We have grown and overcome several challenges over the years. We found that having what I refer to as "final decision makers" (e.g., hospital chief executive officers and fire chiefs) in the room will get us to a decision relatively quickly. We do vote at STRAC, but we have never had a non-unanimous vote; we make decisions via consensus. We are looking for a win-win or a no deal; there is no in between. What's best for the patient (not the hospital administrator, fire chief, surgeon, or nurse) is our guiding mission.

▌ JH

Have you broadened your service to include other time-sensitive emergencies?

▌ EE

Although STRAC has offered and at times advocated for this, we have not transitioned to using MEDCOM for cardiac and stroke patients. STRAC does have multiple related committees (cardiac, stroke, pediatric, mental health, etc.) which set clinical guidelines and work on common protocols and processes, but MEDCOM only handles interfacility critical trauma transfers. We also manage the air medical traffic coming into San Antonio. With 15-20 aircraft in the region, Saturday nights can look like a beehive in our medical center area. Most hospitals can only put one helicopter on their pad at a time. They all call MEDCOM when they're 15 mins out to tell us where they're headed, then five and one minutes out, and upon landing. This has greatly decreased confusion among the hospitals and air medical providers. So, STRAC serves as a consensus- building organizer and coordinator for all time-sensitive emergencies, but during routine operations MEDCOM only
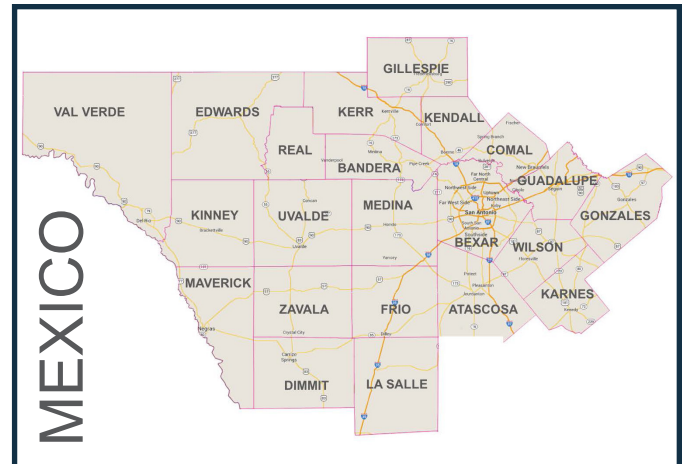
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>
> - Eric Epley

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coordinates critical trauma transfers. This changes during a large-scale event. Following September 11, 2001, for example, we developed our concept of the Regional Medical Operations Center (RMOC). Our RMOC (which is critical for managing large-scale, time-sensitive emergencies) is based on MEDCOM, and we first used it in the response to Hurricane Katrina in 2005.

▌JH

How is MEDCOM used during a mass casualty incident?

▌EE

Victims of the First Baptist Church shooting in Sutherland Springs in 2017 were initially being taken to a small Level 4 hospital near the church, then the next wave of transports were headed by ground to BAMC, the closest Level I trauma center. Using MEDCOM, we instructed the air medical helicopters to overfly BAMC and leapfrog to the other Level I trauma center, University Hospital. A total of nine patients were taken to University Hospital and eight were taken to BAMC; the patient load was balanced, and patients received the best care possible. All trauma team activations pages are sent via MEDCOM, too, regardless of arrival by helicopter, ambulance, or private vehicle, providing MEDCOM a comprehensive view of how busy our trauma centers are. And, since MEDCOM already has established communication links (that it uses on a daily basis) to all hospitals and EMS agencies, it serves as the foundation of the RMOC, so MEDCOM naturally upscales during a large-scale event, making load balancing possible on a large scale.

▌JH

The pandemic posed numerous challenges associated with load balancing; how did STRAC Regional Medical Operations Center support hospitals and EMS?

▌EE

The difference between utter chaos and a busy day can come down to a few patients in the intensive care unit (ICU). Early on, we watched New York City address massive surge activities and noted that there were many facilities within 200 miles (what we consider a drivable distance) of the city. We wondered if encouraging hospitals with capacity in a 200-mile radius to "just take two patients" from overloaded NYC facilities might have eased the load. That was the beginning of our philosophical approach when the surge started in San Antonio.

Historically, STRAC used the Regional Medical Operations Center (RMOC) during hurricane response (e.g., Harvey and Ike) to offload patients from coastal hospitals impacted by the storm to inland hospitals across the state. We load balance these transfers to many hospitals, following "the many hands make light work" concept. We have transferred more than 2,000 patients during these storms to many hospitals, without canceling a single elective procedure in our city. During the pandemic, we began by cohorting COVID patients in one facility, but we quickly had to adjust that, as there were so many COVID positive patients in every facility during the first wave.

The RMOC is physically located in the city emergency operations center (EOC). We look at RMOC as the EOC for medicine. Our RMOC is the defined coordination and command structure for all organizations that comprise Emergency Support Function – 8 (Public Health and Medical) in our EOC. During the pandemic, having an RMOC facilitated regular

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meetings with hospital leaders (CEO/chief nurse officer [CNO]). During one meeting, for example, they agreed to cut back on both cohorting and patient visitation simultaneously and across the city. Doing this in unison across all hospitals eased confusion for the public and patients.
I quickly realized that we needed both senior hospital leadership and hospital emergency managers from the RMOC on the same page. I created the "Med Leads" group, and during the height of COVID, the Med Leads met daily from 9:00-9:30 (after their individual facility huddles), allowing us to identify and solve problems across the city. I consider the Med Leads as the command cell of the RMOC. I was also able to communicate with them via group text message which was incredibly helpful. The Med Leads are system-level vice president/chief nursing officer/chief medical officer types who make operational decisions quickly every day; having them share thoughts daily was incredibly valuable. It also allowed me to have solid visibility on how they were doing so I could communicate that to elected leaders and other senior city/county leaders. I was one of three members of our city/county Unified Command and met with the fire chief and public health director constantly during the surges. When hospitals in rural areas could not keep up with patient loads, the Med Leads group helped facilitate interfacility transfers at a senior level, making the RMOC work much easier.

As we neared crisis levels of surge, we realized we didn't really have crisis standards of care that could be practically followed by intensivists, pulmonologists, and other ICU faculty/staff. We created the Pandemic Medical Operations Workgroup (PMOW), which wasn't the greatest acronym, but was incredibly useful. It was comprised of critical care/intensivists, pulmonologists, chief medical officers, CNO's, emergency medicine practitioners, University of Texas (UT) bioethicists and even clergy and other support team members. We also worked directly with the Disability Rights of Texas legal team. The PMOW group created our crisis standards of care document, and I am proud to say we received either the 1st or 2nd official approval in the U.S. of our crisis protocols from the federal government's Office of Civil Rights.

Other cities used our interfacility transfer strategy as a model. In El Paso, for example, they had staff, but not enough beds to provide patient care. We sent one of the eight Texas Emergency Medical Task Force (EMTF) Field Hospitals (Mobile Medical Units or MMU's) to set up in the parking lot of University Medical Center to help with surge and we assigned personnel to serve as liaisons to El Paso hospitals who worked with our EMTF State Coordination Center and other RMOCs across Texas to identify where there were available beds. We moved 250 patients from El Paso to other facilities across the state in 30 days, all of them via air, because it was not possible to transport patients on high-flow oxygen via ambulance for 10-12 hours. From that experience, we demonstrated that critically ill patients can be safely load balanced (using widely available civilian EMS assets) over distances of 600 plus miles—moving patients from several overcapacity hospitals to many remote hospitals with capacity.

Photos courtesy of STRAC

The Texas Emergency Medical Task Force is comprised of eight regional teams with several components, including strike teams (e.g., Air Medical, Ambulance, Registered Nurse) and support units (e.g., Mobile Medical, Tactical Medic, and Wildland Fire).

Developed in 2009 and created by RACs, the Department of State Health Services, and local EMS and hospital stakeholders, the EMTF can fulfill the need for short notice, emergency health care during a disaster or significant incident.

MOUs exist between the EMTF region, the lead RAC, and the hospital or the EMS agency. This allows the EMTF program to "borrow" health care providers from the sponsoring agencies and reimburse them through state funding. These providers are already credentialed and are afforded worker's compensation and liability protection as State responders.

▌JH

Who paid for the aircraft and ambulances to do the transfers?

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EE

The state pays for the aircraft, ambulances, and staff as they are part of state EMTF activations. When these missions come in, we receive a State Mission Assignment; that is how all expenses related to the mission are covered through reimbursement for the responding EMS provider, hospital, or aircraft. The state then seeks reimbursement for those costs as a part of the overall disaster response.

JH

How did you manage communications and competing requests for beds and staff across the state?

EE

Well, first I have to mention our pre-hospital communications challenges. It became increasingly difficult to hear paramedics over the radio or on the phone through their half-face air-purifying respirator masks, so we acquired a commercial HIPAA-compliant app (Pulsara)[1] that helped us create a unified patient channel from EMS to the emergency department for patient reports. Pulsara then further helped us streamline the El Paso inter-facility transfers across the state. The app connected the sending and receiving hospitals and doctors, the RMOC and state coordination center, and finally the transport agencies. Suddenly, all parties to the transfer could track jets carrying patients and better plan for their exact arrival times. We could also hold telemedicine and consult specialists through the app. The EMTF liaisons could enter patient transfer requests into the app, which then put the patient transfer request into the State Coordination Center (SCC) and other RMOCs across the state. We were able to upload x-rays, labs, and other patient information. Once a facility accepted the patient, the transferring hospital and receiving hospital, along with the transport entity that was assigned, were able to communicate on the same text channel on Pulsara, along with the RMOC and SCC. Using this app statewide significantly helped our load balancing efforts and eliminated 30-40 phone calls to the hospital transfer centers, as they were also monitoring Pulsara for possible patient requests.

We have also used GroupMe1 to track EMTF missions in real-time for many years. When you have an expanding incident and you are adding additional assets and personnel, it can be frustrating to continuously repeat "the story" of what has unfolded. With GroupMe, I can add a colleague to a text "TAC channel" specific for that incident and ask them to read from the beginning up to current content, and we can all be on the same page at the same time. At the end of the incident, we archive the TAC channel. This tool also saved us invaluable time during COVID and beyond. One downside to GroupMe is it isn't HIPAA-compliant so no protected health information can go into it. We are trialing other systems right now, but GroupMe has really filled a gap for us for the past 5-7 years.

JH

Are you still using Pulsara to communicate between EMS and hospitals and for inter-facility transfers?

EE

Yes, and we have integrated Pulsara with EMS electronic medical records systems utilizing the Texas EMS Wristband. The wristband can be used by EMS agencies on a day-to-day basis and also for MCI's. Many of our agencies do not use triage tags anymore. We use colored surveyor's tape on an arm or leg and the Texas EMS wristband, which have been approved by the state as an acceptable alternative to triage tags. Using the wristband and Pulsara in a mass casualty incident (MCI) is helpful; especially when the transport ambulance may not be from the same agency. We all use Pulsara, so the transport ambulance scans the wristband, and they are instantly added to the pulsara patient channel, and any information that has been placed in the patient's channel, including their treatment information and other data is available to the transport ambulance crew. Using this app on a day-to-day basis for routine EMS transports ensures the medics will

> **"**
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>
> - Eric Epley

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[1] *This information was provided by the interviewee and does not indicate endorsement by the federal government of the company or its products.*

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be comfortable with the app should an MCI occur. Many hospitals across the state have adopted the Pulsara inter-facility module in their "patient placement" or "one-call" transfer centers, so again, using these systems daily makes "disaster day" much easier because people are familiar with the app and its features. I fully believe that we have to find and use apps, tools, and processes that work daily and can be scaled for disasters. If you don't use it every day, it will not work well on disaster day.

Photos courtesy of STRAC

JH

Did you ever have to compel transfers during the pandemic?

EE

No, there is a value in being one of the biggest states and having four of the top 10 most populous cities. Someone is going to have a bed somewhere. The RMOC concept is now solidly established in our state. There are multiple RMOCs which are linked together and cooperate and communicate to facilitate transfers.

JH

Did RMOCs support infusion centers for monoclonal antibodies?

EE

Yes, in our region we created regional infusion centers, staffed with San Antonio Fire/EMS paramedics, medical directors/fellows, and nurses from the hospitals. We recognized that many people didn't have a primary care provider to write the necessary script. So, we partnered with the University of Texas Health Science Center San Antonio Emergency Medicine doctors to assist our call/registration center. We had approximately 30 operators in the call center that performed scheduling for the Regional Infusion Center. If the patient didn't have a prescription for the anti-virals, we would use Pulsara to connect a UT emergency medicine physician (or advanced practice provider [APP]) to the patient. Once a patient was registered, the call center staff would text them a link to download the app I mentioned previously. This allowed the patient to meet virtually with the doctor/APP who would help determine whether they needed anti-virals at the regional infusion center and would write the script for anti-virals. This helped keep additional patients from going to the hospitals unnecessarily.

JH

How can your RMOC and others prepare for future threats?

EE

Our individual RMOC is fundamentally important to our local-regional disaster response; however, we would all be better prepared if every major city also had an RMOC. We believe the RMOC concept should be universally adopted across the U.S. The local-regional RMOCs should be linked together at the state level (as they are in Texas), and the State Medical Operations Centers should be linked to each other, which would help to inform the Federal response. This would allow for a much more informed and much more seamless integration of local-regional-state-federal disaster response and management. I believe there needs to be a major move to have real-time, accurate bed availability reporting that doesn't require staff to manually gather and input numbers. Even if this is just activated or viewable during a disaster; it would streamline load balancing significantly and free our staff to attend to duties other than counting, recounting, and updating data. I also believe we should better align the visions of the ACS COT's vision of a National Trauma System and the National Disaster Medical System. When you have a high-functioning day-to-day regional trauma/emergency health care system, your disaster response will be better. It's like a vaccination for disasters. If it doesn't work well on a daily basis, it is not going to go well on disaster day.