Making an IMPACT

TRANSFORMING LIVES, COMMUNITIES AND TRAUMA CARE

ADULT LEVEL I TRAUMA CENTER ANNUAL REPORT 2019
Providing unmatched trauma care to adult residents of eastern Wisconsin and beyond
Published Winter 2019
EXPANDING THE SCOPE OF ACUTE CARE SURGERY AND TRAUMA CARE

During my first two years as the head of the adult Level I Trauma Center at Froedtert & the Medical College of Wisconsin Froedtert Hospital, there has been one constant: The center remains the only such facility in eastern Wisconsin — an invaluable asset to the community and the region at large.

As a regional leader in trauma care, the Trauma Center’s mission is evolving as we strive to broaden the scope of our services. As the need for trauma and acute care surgery is increasing, we’re also focusing on bolstering the level of trauma care at other local hospitals.

To that end, we’re building links and relationships with area hospitals in a variety of ways. From educational programming, such as our annual Midwest Trauma and Acute Care Surgery Symposium, to finding ways to make it easier to transfer patients to Froedtert Hospital for more specialized care, we’re sharply focused on making trauma care more accessible to a wider community.

Our philosophy is that the needs of the patient should be met by the institution. If those needs can be met in the community, we try to ensure patients remain there; however, if the patient requires the level of resources available at our Trauma Center, we ensure a timely transfer. In short, we want to ensure the right patients get in the right beds and receive the right resources to attain the best possible outcomes.

We also continue to expand our role in reducing violence in Milwaukee. You can read about our Hospital-Based Violence Interruption Program in partnership with the City of Milwaukee on Page 3.

This year, we partnered with the United States Army on a training and certification program for military-based medical teams. The benefits are two-fold: Army medical personnel receive training that helps them maintain certifications between deployments, and our center gains from valuable lessons learned in the field. I’m proud to say we’re one of only three Level I trauma centers in the country approved to participate in this program.

We also continue to expand our efforts in world-class trauma care research, one of the center’s core values. Our work here pushes the envelope and ultimately results in improved outcomes for injuries such as trauma to the chest, brain and spinal cord. Moreover, the results of our research aren’t only felt locally. Our published research is read by physicians all over the world. Our research results in changes in care guidelines that improve standards of care thousands of miles away from Milwaukee.

We’re also focusing more on specialized trauma care for elderly people. In cooperation with the Medical College of Wisconsin Department of Medicine, we now have a geriatric trauma specialty team. Older people are more vulnerable in the wake of traumatic injuries, and we’re taking a collaborative approach to achieve optimal outcomes for them.

In short, our Trauma Center is providing world-class trauma care that is making a profound difference in peoples’ lives, locally and around the globe.

Thank you for your continued support.

Marc de Moya, MD
Milton and Lidy Lunda/Charles Aprahamian Professor of Trauma Surgery Chief
Division of Trauma and Acute Care Surgery
A Passion for Trauma Care

CARRYING OUR VISION INTO COMMUNITIES NEAR AND FAR

David Milia, MD, a trauma surgeon and the medical director of the adult Level I Trauma Center at Froedtert & the Medical College of Wisconsin Froedtert Hospital, is responsible for keeping the “Level I” in front of the Trauma Center’s name.

“My job is to keep the trauma program verified through the American College of Surgeons,” Dr. Milia said. He is also the Trauma Center’s education coordinator for surrounding hospitals, a role that includes advising them on how to improve their trauma center operations and procedures.

Dr. Milia is passionate about his role in the Hospital-Based Violence Interruption Program at the Trauma Center and co-directs it with Terri deRoon Cassini, MS, PhD, a trauma psychologist and expert in post-traumatic stress disorder. The program evolved from a relationship with leaders in the City of Milwaukee’s 414LIFE initiative, which centers on a team of community “violence interrupters.” These volunteers are community residents who help defuse retaliation in cases of violent crime in Milwaukee and help people negotiate the recovery process. At the Trauma Center, intervention begins immediately after treatment — in some cases, earlier with friends and family members gathered in the waiting room. A dedicated, on-site coordinator helps patients and families cope with the aftermath of gunshot injuries. This includes helping them negotiate the emotional impact and any pressure they may be feeling to participate in retaliation. They also receive support and encouragement to continue follow-up care for their injuries. Since May 2019, when the hospital-based program launched, about 80 patients have participated. Each year, the Trauma Center treats about 450 people who have suffered gunshot injuries. Dr. Milia and the Trauma Center team are taking action to reduce that number through the Hospital-Based Violence Interruption Program and continued partnership with Milwaukee’s 414LIFE initiative.

Dr. Milia’s experience in treating traumatic injuries extends far beyond the Trauma Center at Froedtert Hospital. As an active duty reserve lieutenant colonel in the U.S. Army, he brings invaluable military experience to the center. His unit is attached to the 452nd Combat Support Hospital based in Milwaukee. During the last 10 years, he has served four combat deployments with forward surgical teams in Afghanistan.

“My military experience is valuable from a clinical standpoint,” he said. “I’ve worked in austere and violent parts of the world and bring the lessons I learn there back home. In fact, most major advances in trauma surgery can be traced back to wars and inevitable battlefield trauma.”

Combining my dream profession and my personal passion — that’s what it’s all about,” said Kelly Jung, manager of the trauma program at the adult Level I Trauma Center. “Best of all, managing this program lets me be part of a center that provides first-class trauma care for people from all over the state. I’m impressed by our team’s commitment to trauma care and the outcomes we help our patients achieve.”

Kelly amassed 27 years of experience at trauma programs in Neenah and Madison before joining the trauma program at Froedtert Hospital in 2018. “We go far beyond day-to-day patient care,” she said. “Our team is committed to constant improvement through research. We’re doing research that is not only saving lives, but also improving people’s lives after the trauma of a life-threatening injury. That has a huge impact on our communities.”

Kelly is responsible for maintaining the strict standards required for Level I verification as well as overseeing clinical care, research activities and injury prevention programs. She also works with regional Level II, III and IV trauma centers to help them develop improved processes and procedures.

Another part of Kelly’s realm is collaborating with the Trauma Quality Improvement Program, in which leaders of the state’s Level I and II trauma centers benchmark quality data and outcomes. “This process tells our group where we’re strong and where we can improve,” she said. “We share best practices and build patient care guidelines together. That helps all of us operate at a higher level.

“People come to us on the worst day of their lives, and we get to work with them to make them better. The outcome we strive for is to return our patients to their homes, jobs and families. Then, we’ve done our job.”
CRUSHED BY A BULL — BACK FROM THE BRINK

When Steve Krueger entered a pole barn on his farm in Plymouth, Wisconsin, to load a steer into a livestock trailer in September 2017, he hardly could have imagined it would be the first step in a journey that would end at the adult Level I Trauma Center at Froedtert & the Medical College of Wisconsin Froedtert Hospital.

All he wanted to do was coax the bull into the trailer. But the 1,500-pound bull had other ideas.

“He was angry at the world,” said Steve, a 55-year-old factory worker who has raised cattle as a hobby for the last 10 years. “He didn’t want to cooperate one bit. I must have pushed him too hard, and he didn’t like it. So he pushed back.”

The bull wedged his horns under a gate that hung from a post tied to the livestock trailer. Trying to keep the bull from escaping, Steve climbed on the gate to weigh it down. That’s the moment his life was flipped upside down in less than a minute.

“He ripped that gate loose and tossed it and me up in the air,” Steve said. “The bull actually threw him in the air as high as the rafters of the barn three times,” said Steve’s wife, Paula, who was watching, horrified, from behind a gate in the barn. “As Steve was coming down the first time, the bull threw him again toward the truck, where he landed on his feet. He threw him a third time, and Steve landed flat on his back near the trailer.”

“He pushed me around the barn for 30 seconds or so,” Steve said. “Then he put his head on my chest and pushed down with all his weight — crushed my chest like a bug. I was terrified — never so scared in my entire life.”

Thinking fast, Paula grabbed a garden hose. “I opened up the hose at full blast and aimed for the bull’s eyes, trying to blind him so Steve could get to safety,” she said. The animal backed off long enough to give Steve time to roll under the livestock trailer. “Paula saved my life,” he said.

Once Steve was under the trailer, he looked down at his chest, which was largely flattened. “I could actually see my heart beating and my lungs moving,” he said. “I thought to myself, ‘Boy, I really did it this time.’”

A short time later, paramedics arrived and took Steve on an ambulance ride to Milwaukee. High winds made it impossible for Flight For Life to offer quicker transport. “I heard one of the paramedics say, ‘I don’t think he’s going to make it,’” Steve said. “Now, I truly know what it means to fight for your life.”

SEVERE INJURIES

Steve suffered extensive crush injuries, including a fractured sternum, nine broken ribs and a broken vertebra (the first one at the top of the spinal column). On almost all of his ribs, the cartilage that connects ribs to the sternum had fracture dislocations. In addition, his thumb was dislocated.

“Steve’s broken ribs created a condition known as a ‘flail chest,’ in which a section of the rib cage separates from the rest of the chest wall, usually due to blunt-force trauma,” said Christopher Davis, MD, MPH, a trauma and acute care surgeon who was on duty when Steve arrived in the Trauma Center. “This type of injury hampers efforts to breathe.”

“He came in with relatively stable vital signs and his mental status was normal — he could communicate with us,” Dr. Davis said. “But he was in a lot of pain. An area of his chest wall was essentially caved in.

“If you would show his initial CT scan to any trauma surgeon, the response would be, ‘Wow!’ The degree of instability was severe. It was amazing that those broken rib ends didn’t impale his heart.”

When patients arrive at the Trauma Center, they immediately undergo a quick but thorough head-to-toe evaluation. Developed by the American College of Surgeons, the formal, highly structured process is designed to detect every injury.

“It’s a regimented, step-by-step approach to make sure we don’t miss anything,” Dr. Davis said. “We also involved Neurosurgery in the evaluation. Access to such specialists 24/7 is part of what we offer at our Level I Trauma Center.”

After evaluation, patients go right to emergency surgery or are sent for additional imaging, if needed, before being transferred to the intensive care unit (ICU). Steve needed cervical spine imaging to determine the stability of his broken vertebra.

A COMPLEX PROCEDURE

While physicians had ruled out life-threatening injuries during resuscitation, there was still the question of whether or not Steve’s spine fracture was stable. “We kept Steve sedated and took aggressive measures to control the severe pain from his chest wall injuries while we determined the stability of his neck,” said Marshall Beckman, MD, trauma and critical care surgeon.

continued
“It’s important to fix an unstable neck fracture before other surgeries.”

Dr. Beckman served as Steve’s resuscitation physician and was one of several doctors involved in his immediate care.

“I was in the ICU when Steve came in,” Dr. Beckman said. “On a scale of one to 10, with 10 being a lethal injury, I’d say his injury was about a seven. His blood pressure, pulse and breathing were within an acceptable range. But his broken ribs caused pain as the ends of the ribs moved with each breath.”

**SOME GOOD NEWS**

Fortunately, Steve didn’t need neck surgery. A CT angiogram scan revealed that the two primary blood vessels that run through the bone and supply blood to the brain were not damaged. Furthermore, an MRI showed the ligaments around the vertebrae were intact.

“That first vertebra is sometimes referred to as the Atlas because, just like that mythical figure who holds up the world, it supports the skull,” said Grant Sinson, MD, a neurosurgeon and the director of Neurotrauma. “It’s a critical structure: Injuries to that vertebra can damage the high cervical spine, resulting in quadriplegia.”

The Neurosurgery team prescribed a rigid device known as an Aspen® neck collar, which serves as a cast for the neck. Steve had to wear the collar for several months until the bone healed.

With the vertebrae stabilized, Dr. Davis began repairing Steve’s chest wall with a procedure known as rib plating. The titanium alloy plates, which are about 4-1/2 inches long and not quite a half-inch wide, are bent with a special tool to custom fit the curve of a patient’s ribs.

After the broken ribs were exposed, Dr. Davis reset each one and attached the plates to bridge the fractures in Steve’s ribs with self-locking titanium screws. At least six screws were used for each plate, with a minimum of three on each side of the break. Steve’s surgery, which took about four hours, required 10 plates and 93 screws.

“His surgery was unusual; it required bridging the cartilage that connects the rib bone and the sternum,” Dr. Davis said. “We rarely have to span across to the sternum. His injury was unique because of the massive amount of force the bull applied to the middle of Steve’s chest.”

**READY RESOURCES FOR TRAUMATIC INJURY CARE**

Steve’s case epitomizes the immense benefits a Level I Trauma Center provides: A team of certified trauma specialists available at all times, top-notch facilities and a highly skilled supporting cast.

“Our staff is very familiar with traumatic injuries and how people recover from them,” Dr. Davis said. “All of our surgeons are board-certified in surgical critical care, and the Trauma Center readily accesses all the resources needed for recovery. That includes post-traumatic stress disorder specialists to help patients recover from the emotional impact of their injuries, physical and occupational therapists, pharmacists, social workers, dietitians and any other specialists needed.

“Our Trauma Center has board-certified specialists in-house and available at all times. Beyond that, the facility has a resuscitation bay in the Emergency Department and a trauma operating room that’s staffed 24/7 for critically injured patients. If someone comes in who is at risk of dying from injuries, we have staff and space at the ready.”

Moreover, fellowship-trained spine surgeons staff the Trauma Center 24/7. “Even for large academic medical centers that treat a high volume of trauma patients, it’s unusual to have fellowship-trained spine surgeons available at all times,” Dr. Sinson said. “We hope you don’t need us, but if you do, our Trauma Center is a treasure to have in your backyard.”

As for Steve, he’s now fully recovered from his ordeal. “I’m not really restricted from doing anything, although my rib cage and legs ache a lot,” he said. “I’m not sure if that’s from the incident or just from getting older.”

Looking back, Steve said he couldn’t have asked for better care. “It was exceptional,” he said. “They saved my life. I’m so grateful for the team of doctors and the Trauma Center at Froedtert Hospital. I’ve been given a second chance at life, and I’m going to try my best to make the most of it.”
Enhancing Neurotrauma Care

RESEARCH ON TRAUMATIC BRAIN AND SPINAL CORD INJURIES

The Froedtert & the Medical College of Wisconsin adult Level I Trauma Center at Froedtert Hospital is the only Level I trauma facility in eastern Wisconsin. To qualify for this highly specialized designation, which is defined by national standards, centers must meet strict criteria, including the availability of neurosurgeons who specialize in treating trauma-induced brain and spinal cord injuries.

To build on its value in trauma care, Neurosurgery at Froedtert Hospital is focusing on integrating its clinical and research platforms. This intensive focus has resulted in new treatment paradigms for patients with brain and spinal cord injuries.

“If findings from our clinical research yield new treatments for brain and spinal cord injuries, we can immediately translate those findings into benefits for patients,” said Shekar Kurpad, MD, PhD, neurosurgeon and chairman of Neurosurgery. “Without this link between research and clinical platforms, cutting-edge treatments would be a dead end in the research world and of no benefit to patients.

As an example, Dr. Kurpad cited the department’s clinical research on stem cell therapy for patients with spinal cord injuries. Dr. Kurpad is a nationally recognized expert on stem cell therapies and a recipient of the Van Wagenen fellowship from the American Association of Neurological Surgeons. He conducted stem cell research at the Karolinska Institute in Stockholm.

“Some of our advanced clinical trials in this area wouldn’t have happened without the link between our clinical and research platforms,” he said. “We’re collaborating on such studies with other trauma centers around the world because we have this combined platform.”

Dr. Kurpad also serves on an international team studying the benefits of early surgical intervention for patients with fractured spines. “One of our recommendations is to stabilize patients who have a spinal fracture — with or without a spinal cord injury — within 24 hours of the injury,” Dr. Kurpad said.

Traditionally, neurosurgeons have waited about a week to operate and stabilize such patients. “Now, we’re finding that the faster we stabilize them, the better their chances of recovery,” he said. “This is changing the culture of how we intervene with these patients.”

Providing this level of spine stabilization expertise within 24 hours of an injury requires an extensive team effort. Many patients don’t arrive at a trauma center until six or seven hours after an injury, which leaves only 17 or 18 hours to stabilize the spine.

“All the resources — from the surgical team to operating room infrastructure — must be logistically available,” Dr. Kurpad said. “We need the entire team to render care in a timely fashion.” The ability to do so is a hallmark of a Level I facility.

Grant funding for brain and spinal cord research is at an all-time high. In 2018, the center received $4 million for spinal cord research and $10 million for traumatic brain injury research. The department also secured several endowments.

“The ability to fund our research through grants is critical because spinal cord and brain injuries are becoming a fairly significant public health problem,” Dr. Kurpad said.

“In many ways, these have been ‘orphan’ injuries because there haven’t been any viable treatments,” he said. “But the work we’re doing is changing that.

“We are a nationally recognized center for neurotrauma research. Our goal is to grow the center into a destination for national neurotrauma clinical and research work.”
Post-traumatic stress disorder (PTSD) and depression can be devastating to quality of life and are often the aftermath of severe injuries. It used to be difficult to predict who might be more prone to these diseases and require follow-up care. Researchers at the Medical College of Wisconsin Comprehensive Injury Center (CIC) on the Froedtert Hospital campus have developed a nine-question survey that helps identify high-risk patients.

“This survivor screening tool took two years to develop and is now used at our adult Level I Trauma Center and other trauma centers nationwide,” said Terri deRoon-Cassini, MS, PhD, trauma psychologist, co-director of the CIC’s Research Collaborative and director of research for the MCW Division of Trauma and Acute Care Surgery.

“It’s an important tool because PTSD is a psychiatric disorder that imposes high costs on society,” said Dr. deRoon-Cassini, who also leads the center’s research on PTSD. “At our Trauma Center, 21-30% of injury survivors develop chronic PTSD or depression. The ripple effects are dramatic because they impair the ability to return to work and engage in healthy relationships. Furthermore, these problems often go undiagnosed, which increases the potential for high health care utilization down the road.”

The development of the PTSD screening tool is just one example of how the CIC works quietly behind the scenes to make Milwaukee a safer and healthier community. While providing top-tier emergency medical care for Milwaukee-area and eastern Wisconsin residents is the Trauma Center’s primary focus, the CIC — through research, education and outreach efforts — works at the other end of the spectrum to prevent injuries.

Established in 1998, the center operates with a seven-member staff, composed mostly of program managers, statisticians and researchers. “In turn, these staff members work with more than 70 MCW faculty members, including physicians, psychologists, researchers and surgeons, as well as members of community organizations,” said Sara Kohlbeck, CIC assistant director.

The CIC has four primary missions related to injury prevention: research, education, patient care and community engagement. The research arm concentrates on injury prevention. Education focuses on community outreach, offering timely topics such as suicide and opioid use. The patient care aspect ensures that research results translate into evidence-based medical practices. And community engagement focuses on helping communities develop strategies to prevent violence.

“When people think about injuries, they usually think about falls and motor vehicle crashes,” she said. “But our work encompasses a range of issues much broader than that, including extensive work on interpersonal violence, suicide and opioid overdose prevention.”

“All four pillars are dedicated to taking a comprehensive look at injury prevention and attacking it in the same way other major research centers tackle diseases such as cancer and cardiovascular disease,” said Stephen Hargarten, MD, MPH, emergency medicine physician and director of the CIC.

All four pillars work in tandem. “An extensive list of MCW faculty are affiliated with the CIC and help run various pieces of these collaboratives with research serving as the primary driver of our work,” Kohlbeck said.

“Injury is such a broad discipline, it’s essential to have everyone involved — from trauma surgeons to experts in behavioral medicine, psychology and pediatrics,” she added. “This broad spectrum of collaborators helps us keep a wide lens focused on the work we do. We focus on a range of individuals from all walks of life, spaces and communities.”

In addition, external advisory committees that work with injury researchers across the state and country keep CIC officials abreast of emerging topics and injuries.

Milwaukee’s new streetcar, The Hop, is an example of how current events spur injury prevention research. The Hop’s introduction on Milwaukee’s downtown streets prompted Dr. Hargarten, in collaboration with University of Wisconsin-Milwaukee
researcher Robert Schneider, to consider whether or not streetcars cause civilian injuries. He obtained a grant to fund a study of the issue.

“A study like this will help inform decision-making about streetcars,” he said. “People see streetcars as a vital complement to city transportation, but a researcher like me wonders if they have an adverse public health effect. For instance, many people now ride bikes. Are they getting injured rolling over streetcar tracks? If so, maybe the tracks should be designed differently. Every idea for improvement starts with a hypothesis.”

An ongoing violence prevention project with the City of West Allis offers a good example of the center’s outreach activities. Every other month, a group of West Allis citizens and CIC members meet with officials and groups from West Allis and the surrounding communities from law enforcement, the health department, fire department, education and taverns to analyze hot spots of assault-related activity.

“These officials use the resulting information to come up with prevention strategies,” Kohlbeck said. “The strategies are informed by current feedback and observations, so community officials can react more quickly to relevant information.”

This multisector approach, based on what’s known as the Cardiff model of collecting assault-related data, works better than relying solely on law enforcement assault statistics. Assaults that may not get reported to police, such as a fight outside a school or a tavern, still get brought to the group’s attention.

“The model is driven by public health concerns, rather than law enforcement concerns,” Kohlbeck said. “Because the focus is on preventing injuries rather than adjudicating crimes, it opens conversations with community members who may not feel as comfortable if the discussion was crime-focused.”

CIC members are constantly looking for new injury trends and patterns and performing research to develop plans to combat them. Faculty members are encouraged to obtain grants to fund research as they identify various topics of interest. In addition, the CIC collaborates on research with faculty from other academic entities, such as the University of Wisconsin-Milwaukee.

As a further illustration of the CIC’s wide scope of interests, the CIC took a lead role in arranging collaboration among military personnel and our physicians from Trauma and Critical Care, Emergency Medicine, Neurosurgery, Orthopaedics, and Anesthesiology along with Froedtert Hospital. This multifaceted collaboration provides an important exchange of skills, knowledge and training, leading to better trauma care in the military field as well as at our own Trauma Center — thus, resulting in better care for all of the communities we serve.

“We’re always looking at how environment plays a role in increasing injury risks,” Dr. Hargarten said. “We form partnerships with leaders at other injury centers across the United States. We act like a center that’s dedicated to reducing a disease burden — in this case, injury and violence.”

PREPARING CIVILIANS TO SAVE LIVES

When people suffer serious injuries that cause uncontrolled bleeding, sometimes all that stands between life and death are bystanders who know how to stop the injured person from bleeding.

“Thanks to a national initiative of the U.S. Department of Defense, since 2017, we have offered Stop the Bleed training classes in Milwaukee and surrounding communities,” said Christopher Davis, MD, MPH, a trauma and acute care surgeon. “The classes are sponsored by our adult Level I Trauma Center at Froedtert & the Medical College of Wisconsin Froedtert Hospital, and we made them available in many community locations.

“Our sessions include a hands-on exercise that help civilians wrap their heads around what life-threatening hemorrhages look like,” Dr. Davis said. “We use mannequins and other training tools to teach people how to pack wounds with gauze, apply pressure and use a tourniquet.

“For our program, our largest outreach effort is to schools,” Dr. Davis said. “We engaged more than 10 public and private school systems to teach their staff the basic principles of hemorrhage control under a partnership with the Southeast Regional Trauma Advisory Council.

“Other medical centers and hospitals are continuing to participate,” Dr. Davis said. “Thousands of people in Wisconsin were trained to save lives by stopping uncontrolled bleeding,” Dr. Davis said.

Nationwide, that number has risen dramatically with more than one million people attending the free training sessions developed by the American College of Surgeons (ACS). Stop the Bleed classes taught by certified volunteer instructors are held statewide upon request. To find a Stop the Bleed class in your area, call Joan Enters at 414-805-8770.
Patient Data for 2018 Provides a Picture of Traumatic Injury in Our Community

Where Patients Come From

In 2018, the Trauma Center provided critical care to people in the following Wisconsin counties:

Transport Method from Injury

Most patients arrived at the Trauma Center via advanced life support in 2018.

Mechanism of Injury

In 2018, patient admissions due to falls surpassed admissions from other causes.

Number of Patients Admitted

Number of Patients Seen

2018 Race and Gender Summary

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Number of Patients Admitted: 2,795

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2018 PATIENT DISCHARGE DESTINATIONS

More than two-thirds of all trauma patients admitted to the hospital go directly home.

- Home: 69%
- Skilled Nursing Facility: 7%
- Rehabilitation: 21%
- Deceased: 4%

2018 AGE GROUPS

Until age 70, males suffer traumatic injury significantly more often than females. In the 20-29 age group, men outnumber women by four to one. (Total number of patients admitted: 2,795)

TRAUMA CENTER STAFF

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