“They not only saved my daughter’s life, but my life, and my family’s life. I don’t know how I could live with myself if she had not lived.”

That’s how Jeremiah Jerzak describes his family’s experience at Essentia Health-St. Mary’s Medical Center after an accident critically injured his 17-month-old daughter, Gwenlee.

Medical teams in Emergency Medicine, Trauma Surgery and Pediatric Critical Care saved the toddler’s life. A chaplain, social worker, grief support counselor and child life specialist joined them in caring for the family.

“Everyone advocated for us and made sure we all were OK,” recalls Leah Jerzak, Gwenlee’s mother. “We’re so grateful for the support and how they helped us. They are professionals, but their humanity was incredible.”

**THE ACCIDENT**

The March 8 accident happened when Gwenlee decided to follow her father outside as he left for work. His truck struck her as he backed out of the garage. Leah was inside their home, also preparing to leave, when she heard her husband’s screams. “We had a miscommunication,” Leah says. “You never think an accident like this can happen to you.”

Leah and Jeremiah called 911 as their daughter lost consciousness and started turning blue. “I’m a nurse but when it’s your child, your training to stay calm in an emergency goes out the window,” Leah says.

The Gary/New Duluth Fire Department and Gold Cross Ambulance responded. Leah rode in the ambulance with Gwenlee while Jeremiah rode with a sheriff’s deputy. “We got caught in traffic and I asked him if he could please turn on the lights and siren,” Jeremiah recalls. “He said he was sorry but he couldn’t.”

Waiting at St. Mary’s Medical Center was an experienced trauma team that included Dr. Tera Hasbargen, an emergency medicine physician; Dr. Krista Wilhelmson and Dr. Steve Eyer, trauma surgeons; and Dr. Joey Rexine, a pediatric critical care specialist.

Gwenlee was in shock and having difficulty breathing so she was intubated. Her only external injuries were tire treads on her right arm and the right side of her face. A thorough examination by the team determined she hadn’t suffered severe head trauma or a brain injury. A CT scan identified a severe liver laceration that was causing massive internal bleeding.

“They let me come in and sing to her,” Leah recalls. “She was so scared because there were so many people. She calmed down and I looked around and saw about 30 people being very quiet.”

Gwenlee was quickly moved to an operating room where Dr. Wilhelmson and Dr. Eyer stopped the bleeding and made sure she had no other internal injuries. The toddler had lost more than half of her blood volume.

Gwenlee was transferred to the Pediatric Intensive Care Unit and into the care of the experienced team led by Dr. Rexine and later Dr. Megan Browning. “With any trauma, I tell the family that we’re going into a storm,” Dr. Browning says. “It will be minute by minute, then hour by hour, then day by day. We do everything we can, then sit back and watch.”

CONTINUED ON PAGE 3
Meet Our Trauma Team

You can entrust your patient’s care to the expert trauma team at Essentia Health-St. Mary’s Medical Center in Duluth. We’re standing by 24/7 with medical specialists who have the training, experience and resources to respond to any emergency. We have the largest and most comprehensive trauma team in the Northland.

We’re just a phone call away. For a consultation or referral, call STAT Doc at (218) 786-7777.

Carlton

You can reach her at (218) 786-4554 or carlton.long@essentiahealth.org.

Preventing childhood injuries

Essentia Health is the lead agency for Safe Kids Northeast Minnesota. The nonprofit coalition promotes a multifaceted prevention approach to childhood injury.

Childhood injuries sustained in and around cars and at play on wheels or on the field are the primary focus. Home safety presentations in schools and to parenting groups also highlight button batteries, poison prevention and fire safety.

Safe Kids Northeast Minnesota recently launched a new website, safekidsnorthland.org, where you can find useful information for your patients and your own family.

Proper use of car seats is a major initiative. Essentia Health helps the Safe Kids coalition offer two car seat checkup clinics each month for parents and other caregivers. One is sponsored by the Duluth Fire Department on the third Thursday of each month and another is sponsored by the Cloquet Fire Department on the third Tuesday of each month.

Want to help recycle old car seats? Essentia Health and Safe Kids Northeast Minnesota plan the third annual car seat recycling event from 9-11 a.m. on Saturday, Sept. 22, at Cloquet Fire Station 1, 508 Cloquet Ave., Cloquet.

Allison Nicolson is injury prevention coordinator at Essentia Health-St. Mary’s Medical Center. You can reach her at (218) 786-4554 or Allison.Nicolson@EssentiaHealth.org.

Gwenlee hugs her family’s dog.

Caring for the whole family

The PICU team closely monitored the critically ill toddler while also caring for her family.”Dr. Joey was with us the whole first day and so was a chaplain who never left our side,” Leah recalls. “We were praying.”

“Jeremiah was taking it very hard and blaming himself,” Dr. Rexine recalls. “I’m a dad myself so I understood. I told him that I am here for him, just like I’m here for Gwenlee. Your family is my family.”

When a family friend brought Gwenlee’s older sisters to hospital later that day, Child Life Specialist JoHannah Orman met Aurora and EvaRose at the elevator. JoHannah explained what had happened and what they would see and hear in their little sister’s hospital room. A ventilator was helping her breath and medicine was helping her rest so her body could heal, she explained. While Gwenlee couldn’t talk with them, they could talk with her and touch her.

“JoHannah was with us the first whole day,” Leah recalls. “She helped the girls feel a little better and was comforting.”

JoHannah says preparing children for a visit helps them. “When children don’t know what to expect, an experience can be overwhelming and frightening. They cope better when they’re prepared,” she explains.

Jeremiah and Leah say they found solace and support in their visits with Georgiann Kuberra, a grief support specialist. She listened and helped them deal with feelings and fears that are a normal part of suffering such a traumatic event. “We focused on the present, not what could have been or what could be,” Georgiann says. “I talked with Jeremiah about what did he know right now. His daughter was being well taken care of. We reaffirmed his love for his daughter and his family.”

Gwenlee spent seven days in Pediatric Intensive Care. “It was scary,” Leah says.

“The staff was so intelligent and quick thinking in extremely stressful situations. I knew Gwenlee was in capable hands. They also knew what we were going through.”

Jeremiah and Leah chose not to transfer Gwenlee to a Twin Cities’ hospital because they were confident in the care she was receiving at St. Mary’s, which is a Level II Pediatric Trauma Center. They also worried about the risks of a transfer when she was still in critical condition and wanted to remain close to family and friends. The family went home on March 22.

Back to being a toddler

“With a trauma, we can’t undo the first injury but we can limit its impact,” Dr. Browning says. “We work well as a trauma team and give patients their best chance. Six months later, Gwenlee is an active and determined toddler. Her parents and doctors marvel that her only serious injury was her liver, an organ that will regenerate as she grows.

“Gwenlee is a little miracle,” says Dr. Rexine. “I do see miracles in the hospital. It’s sometimes hard to explain why kids do so well.”

“I think the fact that she was in her snowsuit and there was ice and snow on the ground may have helped slide her away from the tire,” Leah says.

Gwenlee was her liver, an organ that will regenerate as she grows. "Gwenlee is a little miracle," says Dr. Rexine. "I do see miracles in the hospital. It's sometimes hard to explain why kids do so well."

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Trauma care for aging patients

As the Baby Boomer generation ages, the demographics of trauma have been changing. By 2035, older adults are projected to outnumber children for the first time (Figure 1). A result of these changes is that injuries in the geriatric population have been increasing. Both mortality and complication rates after trauma are higher in this population. Our experience at Essentia Health-St. Mary’s Medical Center has shown that geriatric patients (age ≥65) are 2.1 times as likely to die after trauma compared to non-geriatric patients (4.3% vs 1.7%, 2017 data).

As providers caring for injured patients, we need to be mindful of the unique characteristics and challenges inherent to this population. Aging is associated with many changes that can impact outcomes after injury. Older patients have decreased physiologic reserve due to age-related changes in physiology (Table 1). Increasing age is also correlated with an increased prevalence of various comorbid conditions. Moreover, there are specific complications, such as delirium, which are more common in the elderly.

Due to the age-related decrease in compensatory tachycardia, bleeding elderly patients may have “ occult hyperfusion” after trauma without the expected tachycardia changes that are associated with hemorrhagic shock. It has been observed that in elderly patients with hemorrhagic shock, mortality begins to increase with heart rates greater than 90 (versus greater than 130 in younger patients) and with systolic blood pressures less than 110 (versus less than 90 in younger patients), reflecting their reduced cardiovascular reserve. In normotensive elderly trauma patients, venous lactate and base deficit can both help identify patients at increased risk of mortality (Figure 2).

The American College of Surgeons has released guidelines for the care of geriatric trauma patients as a part of the Trauma Quality Improvement Program, in which Essentia Health-St. Mary’s Medical Center participates. These are summarized below.

INITIAL EVALUATION

There is no difference in the primary survey of an elderly patient as compared to any other injured patient. As you proceed to your secondary survey, there are several important things to consider:

**DETERMINE MEDICATIONS THAT CAN AFFECT INITIAL EVALUATION AND CARE**

Due to the increased rate of comorbid conditions in elderly patients, they may be on medications that can significantly affect their initial evaluation and care such as:

- Warfarin
- Novel oral anticoagulants (NOACs)
- Clopidogrel
- Low-molecular-weight heparin
- Aspirin
- ACE inhibitors
- Beta-Blockers

**CONSIDER ACUTE NON-TRAUMATIC EVENTS THAT COULD COMPLICATE THEIR INITIAL PRESENTATION**

More commonly than in other demographic groups, trauma can be the initial presentation of a non-traumatic medical condition such as:

- Acute coronary syndrome
- Hypovolemia/dehydration
- Urinary tract infection
- Pneumonia
- Acute renal failure

**LABORATORY EVALUATION**

The initial laboratory evaluation of elderly trauma patients should include the following:

- Lactic acid or blood gas (arterial or venous, for determination of base deficit)
- Pt/INR, APTT
- To help identify patients on anticoagulation
- Electrolytes, BUN, Cr, estimated GFR
- To determine renal function and help recognize patients with chronic kidney disease

**IMAGING EVALUATION**

Initial imaging of elderly patients after trauma should include liberal use of CT scanning for blunt injury. While liberal use of CT raises concerns for cost and radiation exposure, elderly patients have a high rate of occult injuries and the radiation risks in this population is minimal. With the transition to iso-osmolar contrast agents, the risk of contrast-induced nephropathy has decreased, even in patients with chronic kidney disease (Hinson 2017). IV contrast greatly improves the sensitivity of CT scans for intra-abdominal injury, so it’s use should be universal in scans ordered after trauma in the absence of a specific allergy to IV contrast. Shefahlag has never been found to be associated with an increased risk of anaphylactic reaction to IV contrast; this should never be a reason for avoiding its use.

- CT scans should be ordered to rule out injury in all areas at risk
- IV contrast should be ordered in all CT studies of the chest, abdomen and pelvis in the absence of a history of allergic reaction to IV contrast media

**ANTICOAGULATION ASSESSMENT AND REVERSAL**

The number of anticoagulant drugs that patients may be on has increased dramatically in recent years. While warfarin increases the INR in parallel with increasing anticoagulant effect, assessment of the level of anticoagulation with other anticoagulants is not possible with the laboratory studies that are a routine part of the initial trauma evaluation.

**Reversal of warfarin**

Fixed-dose administration of 1500 units of four-factor prothrombin complex concentrate (PCC, Kcentra™) reliably and quickly reverses the anticoagulant effect of warfarin in nearly all patients. This is both faster and safer than plasma administration and is the treatment of choice when available. Vitamin K should be co-administered as the reversal effect of PCC is transient.

**Reversal of dabigatran (Pradaxa™)**

A specific reversal agent, idarucizumab (Praxbind™) is available for dabigatran, although it is not a universally stocked medication. This is a monoclonal antibody that binds directly to dabigatran and facilitates its clearance from the bloodstream.

**Reversal of rivaroxaban (Xarelto™) and apixaban (Elitek™)**

A specific reversal agent, adenosine afib (Anexxa™), was recently approved by the FDA for reversal of anticoagulation in patients taking the direct Factor-Xa inhibitors rivaroxaban and apixaban. The FDA approval does not extend to the other direct Factor-Xa inhibitors xesabab (Savaysa™) and betrixaban (Breyxiva™), which still lack any specific reversal agent. This is a competitive inhibitor of these drugs with a short half-life. It is given as a bolus followed by a continuous infusion. Adenosine afib does not facilitate clearance of the drug, so when the infusion is stopped there is a risk of rebound anticoagulation. Additionally, the cost is exceedingly high (more than 10 times the cost per reversal as compared to idarucizumab or four-Factor PCC).

**Reversal of clopidogrel, prasugrel and aspirin**

There are no specific reversal agents for these agents. DDAPV or platelet transfusion can be considered in the face of significant bleeding, although data supporting either intervention is lacking.
You may have heard of a Code Blue, but have you ever heard of a Code NASCR? This code has nothing to do with race cars, but instead is a race to stop a deadly stroke.

NASCR stands for neuro angi-suite for cerebral arterial reperfusion, and the code activates both the specialized suite and a team of medical professionals at Essentia Health-St. Mary’s Medical Center in Duluth. The new team is led by Dr. Vikram Jadhav, a neuro-interventionalist who performs stroke thrombectomies.

“My strokes are due to a clot in an artery blocking the blood supply to the brain,” explains Dr. Jadhav. “Patients can be treated with intravenous ‘clot-busting’ medication, but only within 4½ hours from the onset of symptoms. However, the clot can also be retrieved into the brain artery. When he reaches the clot, he uses a stent retriever on the end of the catheter to capture and pull out the clot.”

This treatment, called stroke thrombectomy, can be provided up to eight hours from symptom onset. Recent clinical trials have shown that thrombectomy can be performed on patients whose stroke is still evolving, even up to 24 hours after symptom onset.

Thrombectomy, done in a timely manner, can prevent profound neurological deficits, such as paralysis on one side of the body, loss of language function, inability to speak or swallow, and even death,” Dr. Jadhav says. Stroke patients from northern Minnesota and Wisconsin have had to be transferred to the Twin Cities for this special procedure, which has often delayed treatment. “Now, we have the same treatment for stroke patients at St. Mary’s Medical Center by partnering with the Minnesota Stroke Network,” Dr. Jadhav says.

Being a stroke neurologist and interventional neurologist means Dr. Jadhav can evaluate patients in the emergency room and quickly activate his neuro-intervention team for a stroke thrombectomy. Once inside the neuro angi-suite on the fourth floor of St. Mary’s, Dr. Jadhav uses real-time imaging to expertly guide a catheter from the patient’s leg or arm artery into the brain artery. When he reaches the blood clot, he uses a stent retriever on the end of the catheter to capture and pull out the clot. This immediately restores blood flow to the brain and prevents a debilitating or life-threatening stroke.

“My care for our patients continues well after the emergency procedure,” Dr. Jadhav says. “My team and I continue to provide care to patients in the Neuro intensive Care Unit, then on the medical floor until they are discharged from the hospital. After being discharged, we follow-up with them in the clinic to ensure stroke prevention and long-term well-being.”

Dr. Jadhav completed a neurology residency as well as fellowships in stroke and cerebrovascular diseases and interventional neurology. He also holds a doctorate degree in cerebrovascular pharmacology from Southern Illinois University’s School of Medicine. His extensive training enables him to treat patients with acute strokes, brain aneurysms, stenosis (narrowing) of neck and brain arteries and other cerebrovascular diseases.

“The exciting field of interventional neurology allows me to bring new research directly to patients and provide complete ‘bench to bedside care,’” Dr. Jadhav says.

Essentia Health-St. Mary’s Medical Center is a Primary Stoke Center, a designation from the Minnesota Department of Health. The hospital and Dr. Jadhav provide life-saving stroke care 24/7 right here in the Northland.

Saving patients’ lives is what our rural medical professionals are the goals of a free training program offered by a team of trauma experts from Essentia Health-St. Mary’s Medical Center.

The trauma center offers the American College of Surgeons’ Rural Trauma Team Development Course (RTTDC) to hospital Emergency Departments and emergency medical services personnel across the Northland. The free one-day course emphasizes a team approach to the initial evaluation and resuscitation of an injured patient. The training team comes to your hospital.

Trauma Program Manager Linda Vogel answers frequently asked questions about the training:

**Why does Essentia Health-St. Mary’s offer the Rural Trauma Team Development Course (RTTDC) to Northland hospitals?**

We want to share our expertise and help people work as a team to care for an injured patient. The makeup of a team at a small rural facility looks quite different than a team at a large trauma center with more resources.

**Who serves on the training team?**

Trauma surgeons, trauma nurse practitioners, Emergency Department physicians and our trauma program manager at Essentia Health-St. Mary’s Medical Center.

**What is the goal of the course?**

The goal is to organize a rural trauma team with defined roles and responsibilities and prepare a rural hospital to appropriately care for an injured patient. We work together to identify local resources and limitations. We train how to assess and resuscitate a trauma patient as well as how to decide to transfer a patient and communicate effectively. The primary goal is to identify the severely injured person and make a decision to transfer within 15 minutes of patient arrival.

**How do staff at regional hospitals benefit?**

Staff benefit by being able to take a course at their own hospital with their own team members. They have an opportunity to talk through patient scenarios and how to best handle them.

**How do patients benefit?**

Patients benefit by having a team that works cohesively together and quickly recognizes when a patient may need to be moved to a higher level of care.

**Who can request the training?**

Leaders of any hospital Emergency Department in northeastern Minnesota, northwestern Wisconsin and Michigan’s Upper Peninsula that transfers patients to Essentia Health-St. Mary’s Medical Center.

**Can emergency medical services receive training?**

Emergency medical services are invited to train with the hospital in the region they cover.

**How much does the one-day training cost?**

There is no fee for the training.

**How long has Essentia Health-St. Mary’s been leading this training?**

St. Mary’s Medical Center was one of the first trauma programs to offer the course in 2006. We recently visited Essentia Health-Northern Pines in Aurora and we’re headed to Mercy Hospital in Moose Lake on Oct. 16.

**How can I schedule a course at my hospital?**

Call Trauma Program Manager Linda Vogel at (218) 786-4433 or email Linda.Vogel@EssentiaHealth.org.

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**Upcoming Class**

**Fundamental Critical Care Support (FCCS)**

**March 21-22, 2019**

Essentia Health-Duluth, Dwan Auditorium, Duluth, MN

Cost: Physician, $600; APRN, PA, $500; residents, medical students, $300; other professionals, $300.

To register: Call Essentia Health Continuing Medical Education at (218) 786-4764 or email cmefacilitator3@essentiahealth.org.

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**Trauma team offers free training course**

Emergency medical services are invited to train with the hospital in the region they cover.
Saving a toddler's life; caring for a whole family
Caring for geriatric trauma patients
What is the Rural Trauma Team Development Course?
New website for Safe Kids Northeast Minnesota
Neuro-interventionalist stops a stroke in its tracks
Upcoming critical care class
Meet our trauma team