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# Critical Moments

Level 1 Pediatric Trauma Center

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NATIONWIDE  
CHILDREN'S

*When your child needs a hospital, everything matters.<sup>SM</sup>*



*For a trauma patient,*  
**EVERY MOMENT**  
*is critical.*

Nationwide Children's Hospital is pleased to present the 2016 Trauma Annual Report. Our expert team is committed to the best outcomes for every patient.

To learn more about our comprehensive program, visit [NationwideChildrens.org/Trauma](http://NationwideChildrens.org/Trauma).

# Trauma Program

“You have a well child, and in a blink of an eye that child’s life can be forever changed by something that was totally unexpected,” says Kathy Haley, MS, RN, Trauma Program manager.

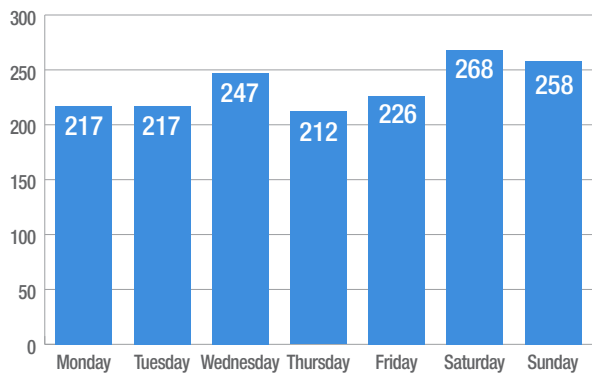
Nationwide Children’s is one of the only freestanding pediatric hospitals in the country with verified trauma, burn and rehabilitation programs.

Nationwide Children's is verified by the American College of Surgeons as a Level 1 Pediatric Trauma Center. Last year, 1,645 children were admitted for trauma care, equal to an elementary school class per week.

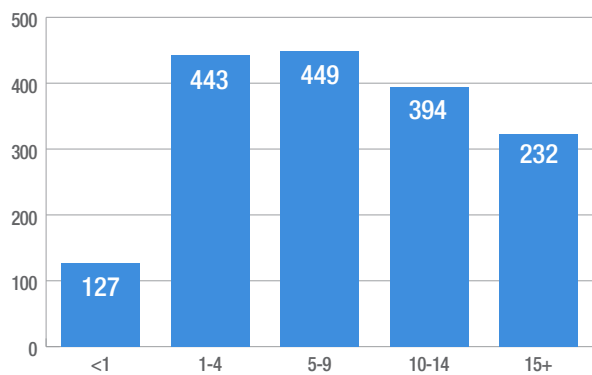
“Virtually every department in the hospital may be involved in their continuum of care,” says Jonathan Groner, MD, Trauma Program medical director. “We make a difference because of the hospital’s commitment to have these resources available.”

The Trauma Program recognizes trauma as a disease. Prevention of injury is a key goal of the program.

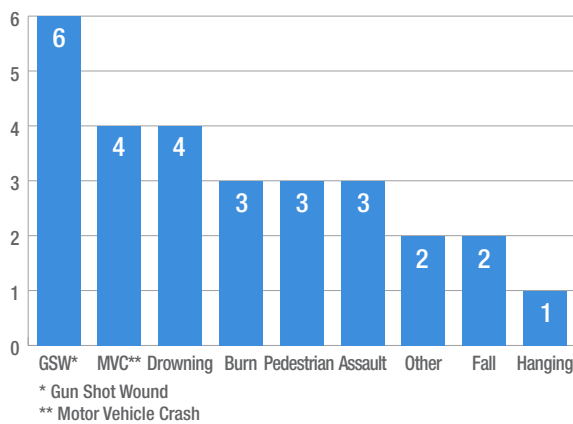
2016 Trauma Admissions by Day of the Week



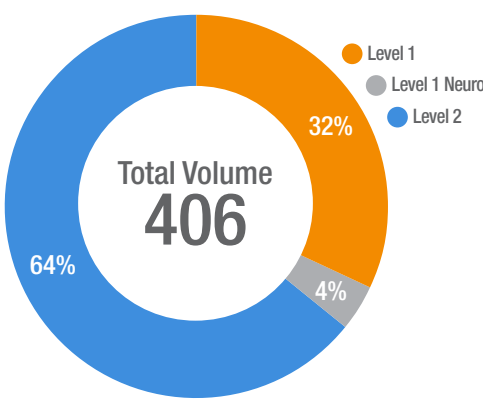
Age Distribution of 2016 Trauma/Burn Admissions



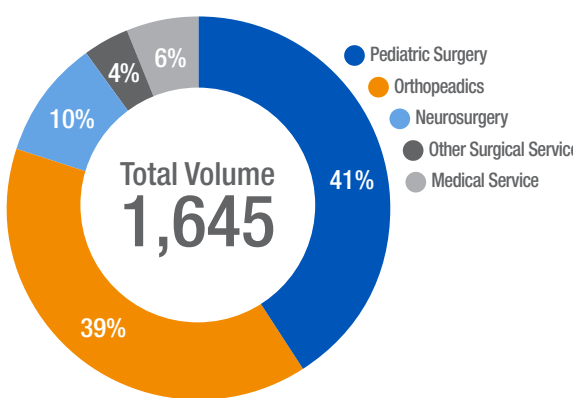
2016 Trauma Deaths by Injury Mechanism



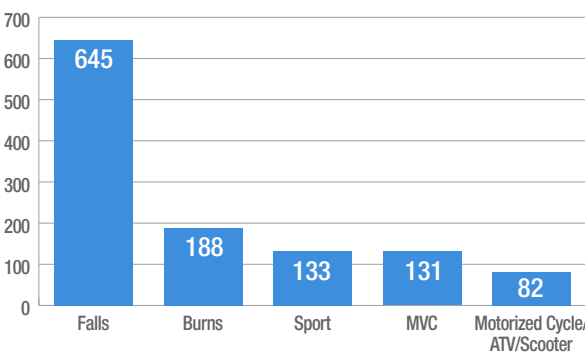
Alert Activation Levels Requiring Admission for Injury



Admissions by Service (2016)



2016 Top 5 Leading Causes of Injury Requiring Admission





# Burn Program

The Burn Program at Nationwide Children’s is verified by the American Burn Association and American College of Surgeons. Burn patients and their families receive the expertise and support of a comprehensive, multidisciplinary team from arrival to the hospital often into adulthood.

“We take care of their immediate, acute needs when burn injury happens, then we follow them longitudinally the rest of their lives,” said Rajan Thakkar, MD, a pediatric surgeon and associate medical director of the Burn Program. “We make sure that their burn scars heal, they don’t develop contractures and they’re able to walk and reintegrate themselves back into society.”

The team of surgeons, nurses, therapists, psychologists, speech and language pathologists, child life specialists, pharmacists, dieticians, social workers and care coordinators deliver thorough, integrated care using best practices and the latest technologies.

The program is active in school re-entries. Therapists may accompany a patient on his or her first day back at school to help explain the injury and smooth the transition. In addition, the burn nurses present burn prevention education in elementary schools throughout the area.

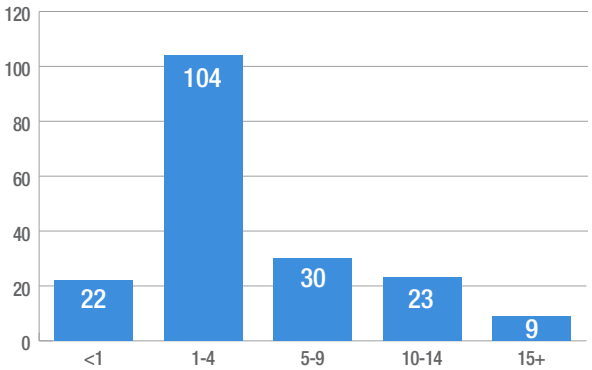
Patients return regularly to the program’s Burn Clinic where staff monitors their condition and responds to their medical needs. Each summer, the program hosts a burn camp, where patients and their families can relax, discuss issues they face and build a support network.

To learn more about the Burn Program visit [NationwideChildrens.org/Burn-Program](http://NationwideChildrens.org/Burn-Program)

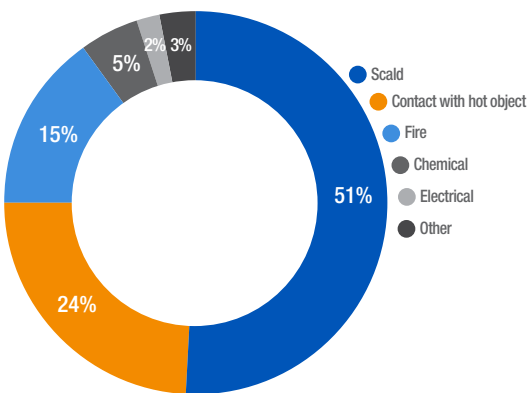


Last year, the program cared for 188 children who suffered burns — the second leading cause of injury requiring admission.

Burn Admissions by Age in 2016



Top Causes of Burn Injury Admissions in 2016



# Center for **Pediatric Trauma Research**

The Trauma and Burn Programs are committed not only to providing the best care possible but to improving care by developing innovative evidence-based treatment.

“This is not research in an ivory tower,” says Henry Xiang, MD, MPH, PhD, director of the Center for Pediatric Trauma Research, which is part of the Center for Injury Research and Policy. “We’re working closely with clinicians to improve outcomes for our patients at this hospital and, ultimately, hospitals worldwide.”

Trauma and burn researchers at Nationwide Children's have published more than 100 studies in the last three years.

In 2016, these included:

- Hospital-based screening tools used to identify child neglect and abuse
- Tools to identify those who are high risk for temporal bone fractures and hearing loss among helmet-wearing children in recreational vehicle crashes
- Examination of factors influencing nurses’ accuracy in rating procedural pain among pediatric burn patients

With collaborators as near as the Columbus Division of Fire and as far as medical institutions in China, researchers are currently investigating:

- Components of care that improve the outcomes of children with life-threatening hemorrhage, the leading cause of pediatric death within 24 hours of injury
- The optimal amount of time a child should rest after concussion before returning to school and physical activity, and when it’s safe for teens to return to driving after a concussion
- The cause of burn patients’ susceptibility to pneumonias and wound-site, bloodstream, urinary tract and other infections
- The range of mental health issues, beyond post-traumatic stress disorder, that arise with burns and traumatic injuries
- Traits that predict whether children with traumatic brain injury are unlikely to return for follow-up appointments, with the goal of removing barriers to their continued care



Researchers are also developing:

- Virtual reality games and experiences to distract children from painful dressing changes and procedures and reduce the reliance on sedatives
- Screening tools to better identify and treat cervical spine injuries, pinpoint the children most at risk for mental health issues that would arise weeks or months after a trauma, and help EMTs and paramedics recognize child abuse
- Revised protocols used on the playing field for apparent cervical spine injuries

- Pressure mapping techniques to determine where children who have suffered spinal cord, brain or other mobility-limiting injuries are likely to suffer pressure sores and prevent complications
- A safe method to transport a child wearing a spine-stabilizing device in a car

Learn more about ongoing research initiatives at [NationwideChildrens.org/Center-Pediatric-Trauma-Research](https://www.nationwidechildrens.org/Center-Pediatric-Trauma-Research)





In her home in Newark, Ohio, Cathlynn Ellis had turned to fill a glass at the counter when 9-month old Chloe darted to the kitchen island and pulled the slow-cooker's electrical cord. In that instant, the pot spilled and Chloe was scalded.



# Chloe's Story

Emergency medical technicians arrived and Ellis insisted the baby be taken to Nationwide Children's. There, a Level 1 Trauma Team was waiting for Chloe. They immediately began to assess her injuries and start treatment.

"About 26 percent of Chloe's body suffered second-degree burns," says Rajan Thakkar, MD, one of Chloe's surgeons and the associate medical director of the Burn Program. "Anything over 10 percent is very significant, especially in someone so young."

## FAMILY-CENTERED CARE

With her breathing and other vital signs stable, Chloe was taken to the Pediatric Intensive Care Unit (PICU), where a constellation of specialists began working together to help Chloe and her family cope and recover. Each morning, members of the medical and burn teams met during multidisciplinary rounds outside Chloe's room and discussed her condition, progress and plans for the day with her parents at the bedside.

"More doctors and nurses came every day, but it was nice, because every day we came up with more questions and they were able to answer them," Ellis says.

Though Chloe was tethered to lines and tubes, her therapy began immediately with a family-centered, team approach. A Child Life specialist held her to comfort her, patting and singing to the baby as she positioned her to avoid aggravating the burns. She and an occupational therapist coached Ellis to become comfortable holding her daughter.

A physical therapist focused on retuning Chloe to eating, playing, crawling and standing as she had before her injury. A therapeutic recreation specialist adapted Chloe's play to enhance her health and social interaction. A massage therapist regularly treated Chloe to relieve stress and anxiety and massaged the scars as her burns healed to keep the skin pliable and allow her to move freely.

All the while, the therapists and specialists taught her parents to be hands-on and lead the activities. "Our number one goal is to teach Chloe's parents how they can best help her," says physical therapist Sarah Eilerman.

## HEALING PROCEDURE

Days after she arrived, it became apparent that some of Chloe's wounds on her arms and ankles were deeper and failing to heal.

When young, Chloe's mom had been treated for a life-threatening condition at Nationwide Children's. She had confidence in the institution and knew other hospitals didn't see this every day.



To avoid skin grafts and significant scarring, Dr. Thakkar and his team applied a dermal substrate to the remaining healthy tissue to help new skin grow. Nationwide Children's is one of the first hospitals to treat pediatric burn injury patients this way.

Casts were applied to Chloe's ankles, protecting her wounds while affording her support to crawl and stand and continue regaining mobility.

After a few more days, a discharge planner helped arrange a schedule of follow-up visits. By then, Chloe was crawling and standing.

Dr. Thakkar and the care specialists at Nationwide Children's continue to see Chloe in the outpatient Burn Clinic, monitoring her progress and helping her parents provide the best care for their child.

"I knew that here, she'd be in the best hands," says Ellis.

# A Comprehensive Approach for Trauma Patients

## ACUTE INPATIENT CLINICAL THERAPY SERVICES

Physical, occupational, recreational and massage therapists and speech-language pathologists begin their work as early as a child's first day in the PICU and continue as needed up to discharge from the hospital and any potential follow-up visits.

"Through coordination with the team of physicians, nurses, respiratory therapists and other experts who implant and maintain the lines and tubes used to monitor, feed and provide fluids, we're getting patients up sooner," said Jennifer Meagher Lane, MPT, a physical therapy clinical leader and member of the Burn Program's inpatient physical therapy team. "Early data shows we're decreasing the days patients are intubated and days in the ICU."

Children require more time to recover each day they lie in bed. Therapists work to restore mobility, gross and fine motor function, flexibility and endurance, and to reduce anxiety and stress. As children are moved to the trauma and burn floor, therapeutic activities are often disguised as developmentally appropriate play: toys to shake, bean bags to throw, blocks to manipulate, scooters and bicycles to ride in the hallway and walking trips down the hall to see parents.

A major part of their effort is teaching caregivers how to help their child continue to improve and reach the goals of functioning safely at home and school, returning to crawling and walking, playing baseball or the tuba.

## PSYCHOLOGY

Psychologists screen trauma patients and their caregivers for risk factors that could contribute to the development of posttraumatic stress symptoms.

"We know that the emotional and behavioral health of our patients and their caregivers can impact physical outcomes," said Sarah VerLee, PhD, a pediatric psychologist dedicated to the trauma and burn teams. "So it's very important to address the behavioral and emotional healing aspects of healing."

The psychologists provide immediate intervention as needed during the hospital stay. They follow up with patients and their families, especially those with higher risks for PTSD, in burn and trauma clinics. There, they may continue intervention or connect the family with behavioral health resources closer to their home.

The field of psychology in acute medical trauma is relatively new, and Nationwide Children's is

engaged in research, including tracking outcomes from a mental health perspective. The psychology program offers one of the country's only pediatric psychology fellowships with a specialized track in trauma and critical care.

## CHILDLIFE

Child Life specialists help children and their parents cope with hospitalization and reduce stress and anxiety through a number of strategies.

Child Life specialists explain why the child is in the hospital, explain their diagnosis, help prepare them for tests and procedures, dressing changes and more.

"We take the medical and scientific language and put it into developmentally appropriate language for the child and for the family," said Child Life Specialist Lisa Kappy.

With parents, Child Life specialists develop coping plans to manage the child's fear and separation and the discomforts and pain that can be part of the treatments. Child Life specialists will accompany the child and caregivers to procedures, often lending a hand by distracting and soothing the child. To promote normalcy, they will engage children in therapeutic play and activities one-on-one and in groups, bringing the child's siblings into the group when possible.

## INPATIENT REHABILITATION PROGRAM

Some trauma patients may qualify for services in the Inpatient Rehabilitation Program. Inpatient rehab is designed for those patients requiring intensive inpatient therapy with the ability to participate in

a minimum of three hours of therapy per day with potential to make functional gains following their traumatic injury.

"We are an extension of the whole trauma continuum," said Cindy Iske, MS, OTR/L, rehabilitation coordinator. "We want to get children back home, to school and to their peers – that's our focus."

Each child has a schedule designed according to their needs. Services may include: physical, occupational, speech, recreational, massage and music therapy, child life, school, psychology and social work. Patients and families are involved in daily goal setting and family-centered rounds. Families are encouraged from day one to begin learning and participation in care.

Physical Medicine and Rehabilitation physicians manage the medical care and treatment of the rehab patient and collaborate with the trauma service regarding ongoing surgical and/or medical needs of the patient. The rehab unit is one of the few programs in the state of Ohio that is equipped to accommodate patients on ventilators.

The Rehab Program has been accredited by CARF (Commission on Accreditation of Rehab Facilities) as a Pediatric Specialty Program since 1992.

View our state-of-the-art rehabilitation services at [NationwideChildrens.org/Rehabilitation](http://NationwideChildrens.org/Rehabilitation)





Ruth Seaman was driving her four children home in Marysville, Ohio, when another car crossed into her lane and they collided.





# Daniel's Story

The Allen Township Fire Department focused on 10-year-old Daniel, whose face was bleeding heavily. The crew stabilized Daniel, and he was flown to Nationwide Children's.

A Level 1 Trauma Alert Team thoroughly assessed Daniel and stabilized him further in the trauma resuscitation bay. He'd suffered a concussion, extensive facial fractures, an orbital hemorrhage and a deep, 3-inch laceration ran from the right corner

of his mouth across his cheek. He'd also lost four teeth as a result of the injury.

"By the time I came to his room, they had already run scans and tests and had all sorts of answers," Seaman says. "The room was full of nurses and physicians, and they were explaining what they were going to do, what the possibilities were, what the risks were for all the things that might happen...they were just amazing."

An ear, nose and throat surgeon performed a complex multilayered closure of the lacerations to Daniel's cheek, mouth and gums. Using an endoscope for guidance, he repaired cuts inside Daniel's nose and set his fractured nasal septum. From surgery, Daniel was taken to the PICU.

## EMPOWERING FAMILY

The Seaman family was met in the PICU by a team of therapists and psychologists whose goals were to ensure Daniel and his family were prepared to return home safely.

"To me, the biggest help was learning how to talk to Daniel," Seaman says. She was distressed about how to tell Daniel of his injuries and the crash when he regained consciousness.

Nationwide Children's psychologists recommended approaches and role-played with the Seamans and suggested ways to discuss the crash and Daniel's injuries with his siblings.

"They were also able to keep it all in context – that this was not crazy what we were going through – and that everything will be okay in the end. It was good to have them there."

## EMPOWERING DANIEL

Four days after the crash, trauma therapists got Daniel out of bed and walking. He needed support from his mother and a therapist to sit, stand and walk.

An occupational therapist brought him Legos®. As Daniel stood and played, he increased his endurance and showed he could multitask. As he manipulated the pieces, the therapist watched for cues revealing how he'd grip a pencil or use scissors, his problem solving and motor planning, his ability to scan for needed pieces and his depth perception. She would also hold out a pinwheel for Daniel to blow on to regain flexibility and coordination in his lips and mouth. By the time he left, he could chew a bite of hamburger and drink through a straw.

He returns to Nationwide Children's for follow-ups on his surgeries, the broken bones near his eye and his concussion. He'll be fitted with temporary teeth after his gums fully heal.

"I don't have a lot of experience in hospitals to compare, but I'm glad we were at this one," Ruth Seaman says. "It was just wonderful, wonderful care we received."



# Working With the Community

## PASSENGER SAFETY PROGRAM

When it's time for a child to go home, the Passenger Safety Program provides child safety seat assistance and consultation to families and, when needed, age- and size-appropriate seats or harnesses to prevent or reduce injuries and deaths.

"Putting kids in a car is one of the most dangerous things we do with children," says Program Coordinator Carrie Rhodes, a child passenger safety technician-instructor. "We want to protect these kids."

Motor vehicle crashes were the fourth-leading cause of injury requiring admission to Nationwide Children's last year. Studies consistently show that appropriate seats substantially reduce the risk of harm but common installation and use errors erode protection.

The program provided 483 child safety seats to families to ensure safe transport last year. The majority went to families whose child's car seat had been rendered unsafe in a crash. Throughout the hospital and at in-house clinics, the program also provided education to families and hospital staff on a wide variety of conventional and special needs restraints.

## EMS PROGRAM

In Ohio's largest prehospital catchment area, Nationwide Children's Emergency Medical Services Program provides expertise and guidance in pediatric trauma care to the local emergency medical technicians and paramedics who respond to serious pediatric injury and illness.

Less than 4 percent of EMS runs in the 37-county region involve children. To help these children receive the best care possible, the EMS Program's main effort is to provide outreach education. The goal is to make the local EMS providers feel more comfortable and competent in their skills.

EMS educators taught 53 outreach classes to 634 certified EMS providers in 2016 and, upping their game, had already taught 27 classes to 435 providers during the first three months of 2017.

Classes include:

- Emergency Pediatric Care
- Pediatric Airway Emergencies
- Farm Trauma
- Medical Emergencies
- Neonatal Respiratory Distress

- Sepsis
- Children With Special Needs
- Cold-Related Injuries
- Delivery Room Resuscitation

Members of the EMS Program function as liaisons, developing the rapport needed to create a collaborative continuum of care, providing prompt patient follow-up to local crews, positive patient care feedback and initiating performance improvement.

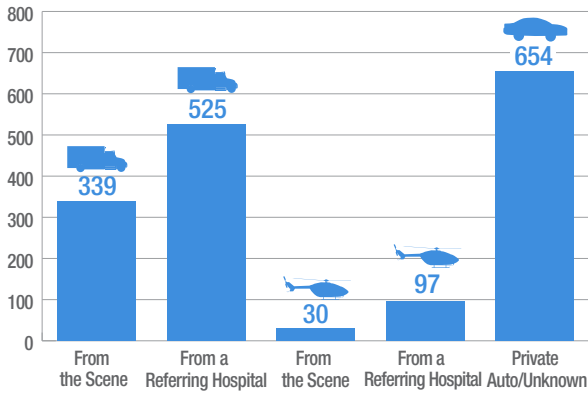
To learn more, visit [NationwideChildrens.org/Emergency-Medical-Services](http://NationwideChildrens.org/Emergency-Medical-Services)

## TRANSPORT PROGRAM

The Transport Program brings children who need the expertise of Nationwide Children's from hospitals and clinics as near as a few miles and as far as California.

"Under the direction of the medical control physician, specialty crews in the mobile intensive care units – which are the highest category of ambulances licensed by the state – can do almost anything that can be done in an ICU," says Program Manager Amy Haughn, MBA, RN, CMTE. "The Monarch I helicopter is one of the few in the country that can offer combined nitric oxide therapies and high-frequency ventilation for neonatal patients in respiratory distress." Jet aircraft hired for the longest transports are equipped according to patients' needs.

Trauma Patient Admissions by Mode of Arrival in 2016



The program made more than 2,400 transports in 2016. 55 percent of the patients were newborns. Patients came from 122 different referral facilities in 16 different states.

When collecting patients, specialty crews confer with physicians at the referring facility, assess the patient and obtain lab tests, Haughn says. "We want to give our medical control physician a really clear picture, so, if indicated, we can start life-saving interventions before we reach the bricks and mortar of the hospital."

Safety is at the forefront of all work the transport teams perform. The helicopter pilots are capable of flying by instruments in clouds and fog and the aircraft is equipped with a terrain awareness and avoidance system. The program is accredited by the Commission on Accreditation on Medical Transport Systems.

Learn more at [NationwideChildrens.org/Transport](http://NationwideChildrens.org/Transport)







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