

OREGON HEALTH & SCIENCE UNIVERSITY

2019 Trauma Program Report

Transforming Trauma Care



Table of contents

OHSU trauma system background..... 4

Trauma statistics..... 6-9

Trauma team response.....10

Mechanism of injury..... 11

Hospital admissions via OHSU trauma program13

Mortality 14

Care for patients older than 64.....15

Care for patients 14 years and younger..... 17

Pediatric injury prevention 19-20

Leading the way in pediatric trauma outcomes, education
and outreach 21-23

Research.....24-26

Publications27-32

In memorium 33

Trauma faculty 34-35

Highlights

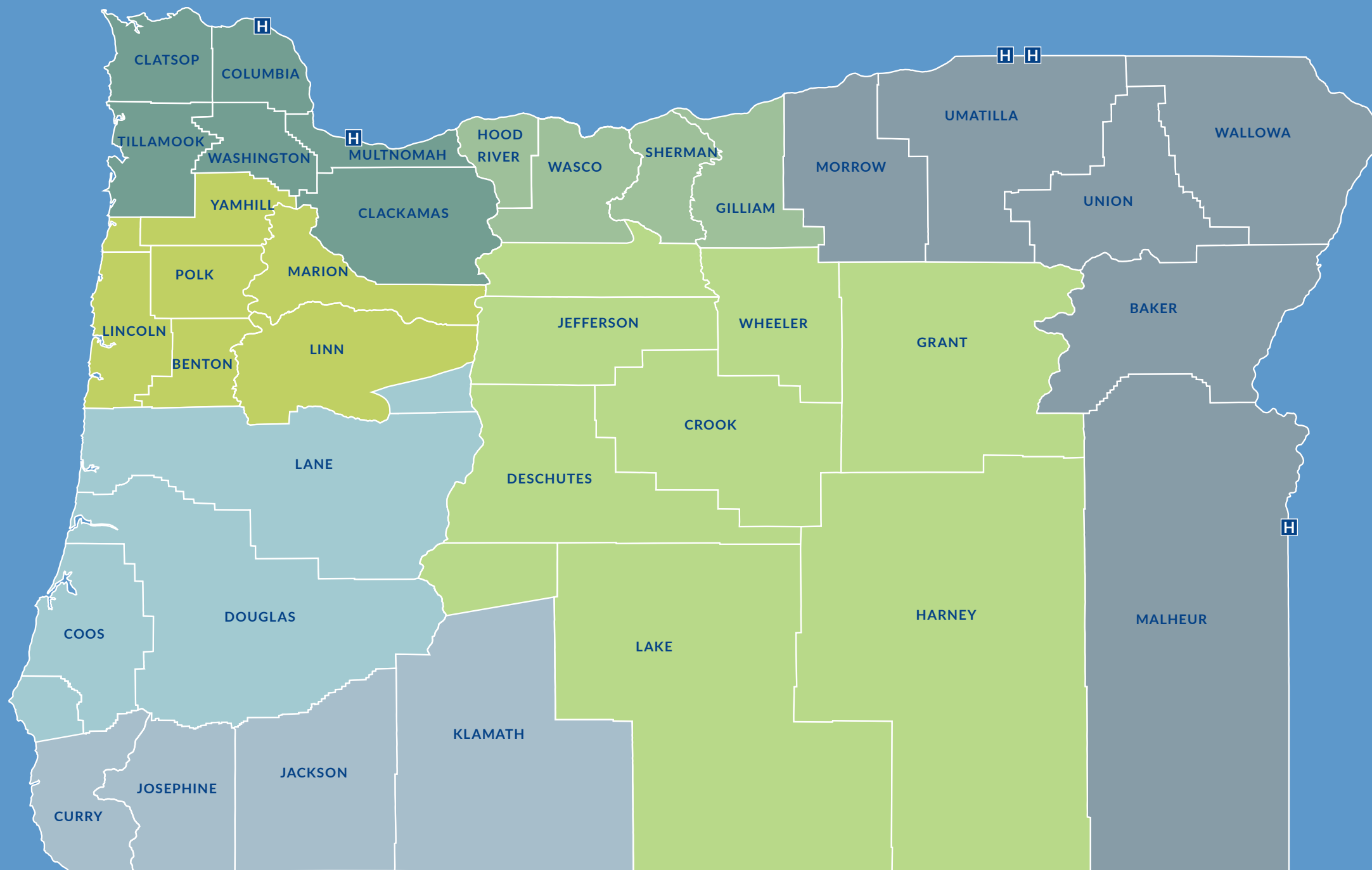
- **Patient Care:** The Trauma Service at OHSU treated 3,025 patients in 2019.
- **Injury:** Falls were the most common cause of injury for all patients.
- **Age:** The volume of elderly patients rose 9% from last year.
- **Research and Funding:** The Trauma Laboratory had another productive year, publishing 47 research papers and receiving \$17 million in funding for the year.
- **Fall prevention education:** OHSU led 206 community members in fall prevention seminars.
- **Outreach:** The OHSU Trauma Team taught Stop the Bleed to 1,777 individuals throughout the state.

The OHSU Trauma Team at the 30th anniversary of the Oregon Trauma System Gala.



OHSU Trauma System background

Oregon's trauma advisory board regions by area



MAP COURTESY OF OREGON DHS: <http://egov.oregon.gov/DHS/ph/ems/trauma/docs/hosp-map.pdf>

Oregon's statewide trauma system is based on landmark legislation. The Oregon Legislature passed statutory authority in 1985 as ORS 431.607 – 431.633, under the leadership of the president of the Oregon Senate, John Kitzhaver, M.D., and signed into law by Governor Victor Atiyeh. With the implementation of the trauma system in May 1988, only two Oregon hospitals, OHSU and Legacy Emanuel Medical Center, were designated as Level I trauma centers. Injured individuals in the four-county metropolitan region identified by prehospital rescue personnel or emergency medical technicians as meeting the criteria for severe injury are transported to one of these Level I centers.

Published research comparing interhospital transfer practices before and after implementation showed improvement in rapid transfer of critically injured patients to Level I and II trauma centers as well as improved outcomes.

Summary of OHSU Trauma Program's 2019 statistics

- 1,688 patients (55.8%) were brought to OHSU directly from the scene of injury; 1,230 (44.2%) were transferred from another hospital.
- Falls were the most common mechanism of injury for all patients, surpassing motor vehicle collisions.
- Penetrating trauma was 8% of all trauma, unchanged from last year.
- Deaths from falls also surpassed those from vehicle collisions.



Dr. Martin Schreiber speaks at the 30th Anniversary of the Oregon Trauma System Gala.



Trauma nurse leaders celebrate 30 years of trauma care.

Trauma statistics

In 2019, the OHSU Trauma Program total patient volume decreased by 10 patients, representing a 0.3% decrease over the previous year.

Figure 1 | Patient volume 2017–2019

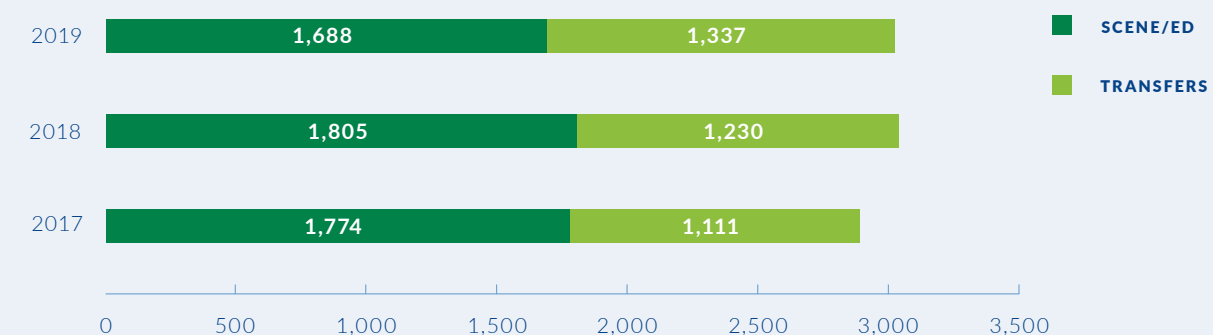


Figure 2 | Gender distribution of patients treated by the OHSU Trauma Program

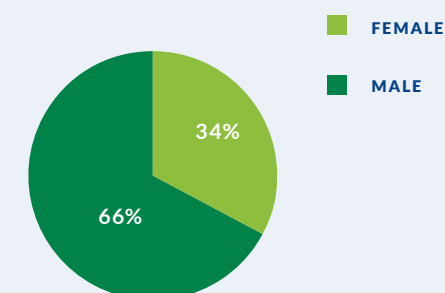


Figure 3 | Patients treated by the OHSU Trauma Program: blunt vs. penetrating injuries

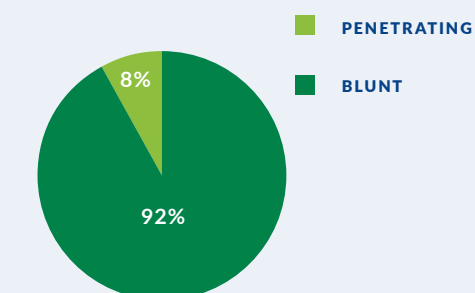


Figure 4 | Age distribution of patients treated by the OHSU Trauma Program

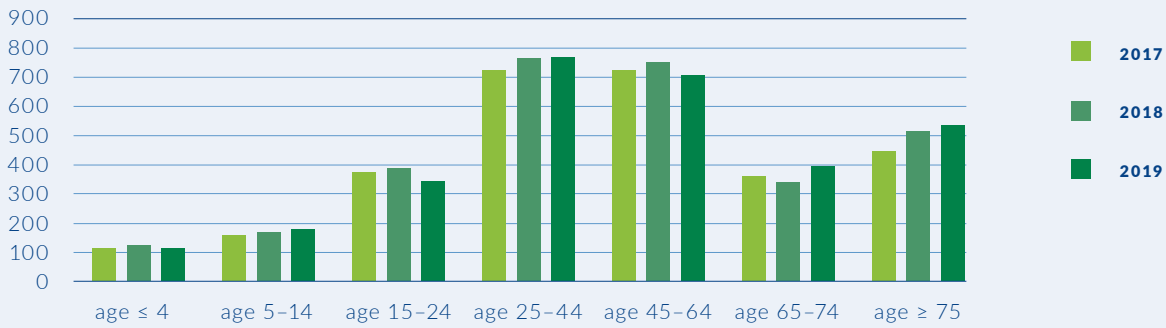


Figure 5 | Incidence by age of patients treated by the OHSU Trauma Program

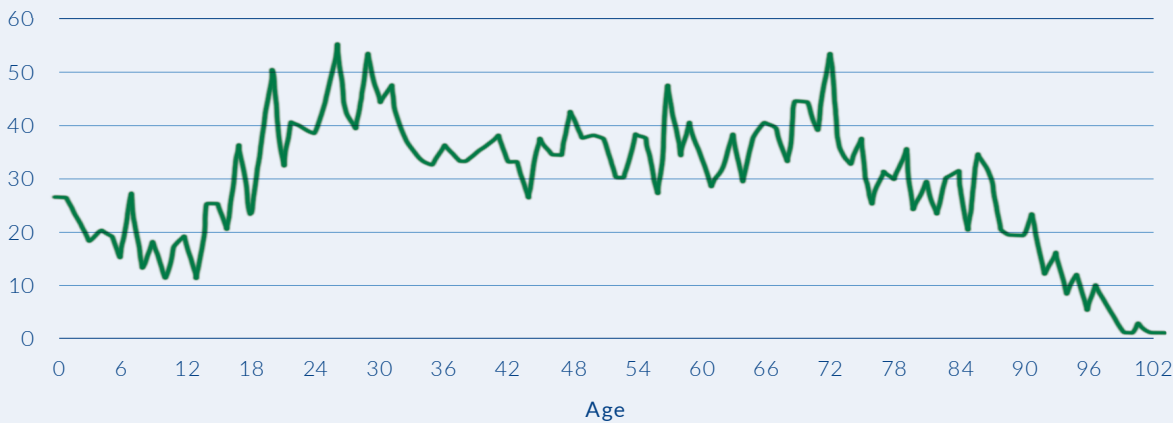


Figure 6 | Incidence by age and gender of patients treated by the OHSU Trauma Program



Figure 7 | Distribution of patients by month

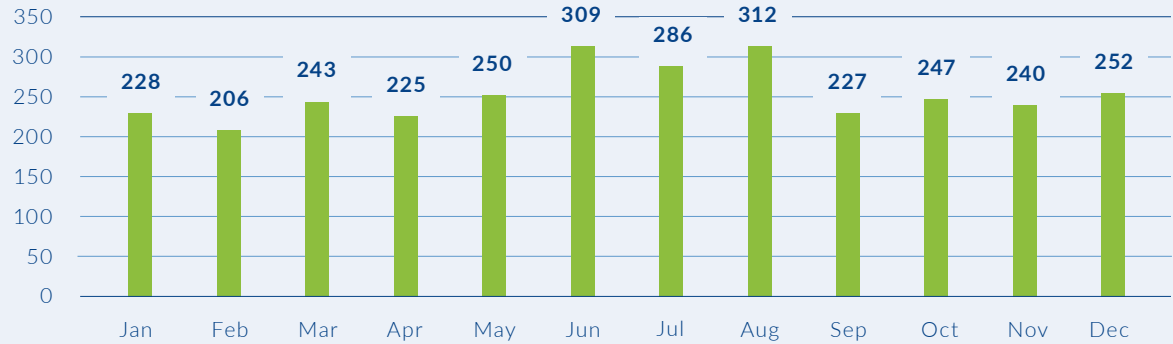


Figure 8 | Distribution of patients by day of week

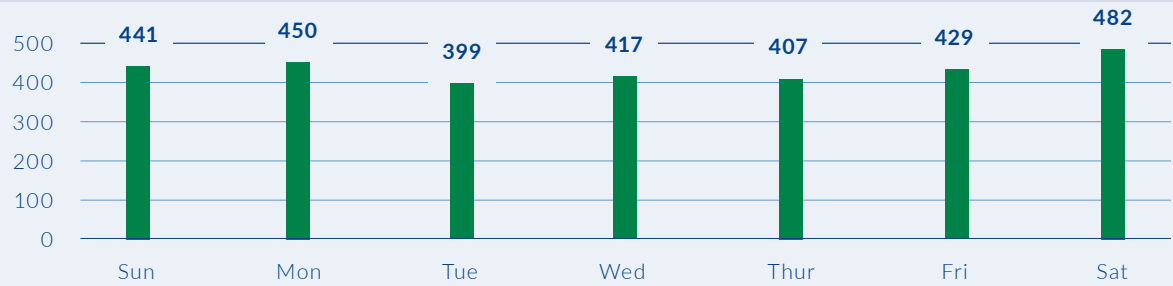


Figure 9 | Distribution of patients by time of arrival

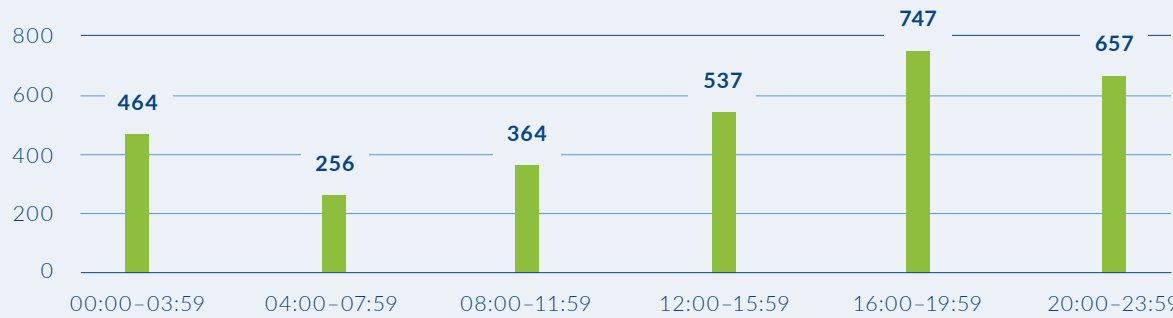


Figure 10 | Total hospital length of stay of admitted patients



OHSU Trauma Team response

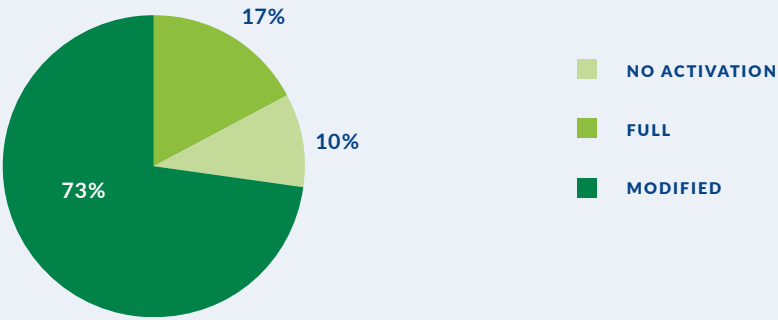
In 2018, the OHSU Trauma Program changed to a two-tiered system to evaluate injured patients. The level of activation is based on information provided by prehospital personnel (Table 1 and Figure 11). In the Portland metropolitan area, paramedics evaluate patients at the scene of injury. If patients meet the established triage criteria for serious injury, the paramedics enter them into the trauma system. Our analyses indicate patients can be safely and efficiently treated with a limited team response, saving full trauma team activations for those truly critically injured patients.

Table 1 | OHSU Trauma Team configuration based on triage criteria

Full	Modified
Staff trauma surgeon	
Staff anesthesiologist	
Staff ED physician	Staff ED physician
Trauma chief resident	Trauma chief resident
Emergency medicine resident	Emergency medicine resident
Respiratory care practitioner	Respiratory care practitioner
Primary trauma nurse	Primary trauma nurse
Trauma recording nurse	
Procedure nurse	Procedure nurse
Transportation aide	

ED = EMERGENCY DEPARTMENT

Figure 11 | OHSU Trauma Team response by level of activation



Mechanism of injury

In 2019, falls surpassed motor vehicle collisions as the most common cause of injury, although motor vehicle collision remains the most common mechanism of people ages 15-64.

Figure 12 | Causes of injury for patients seen by the OHSU Trauma Program

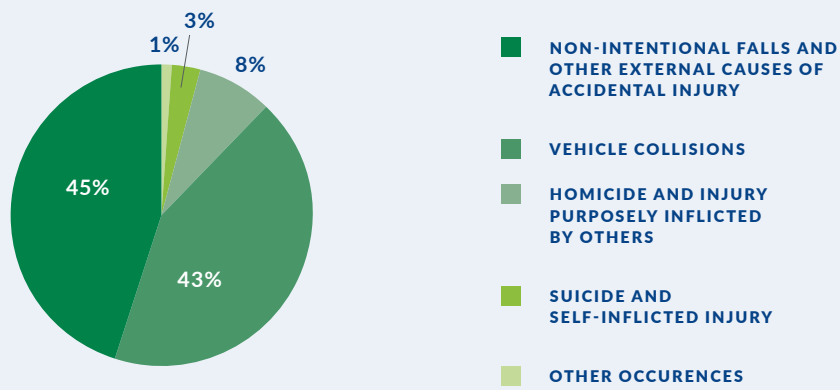


Figure 13 | Incidents by injury cause and age group

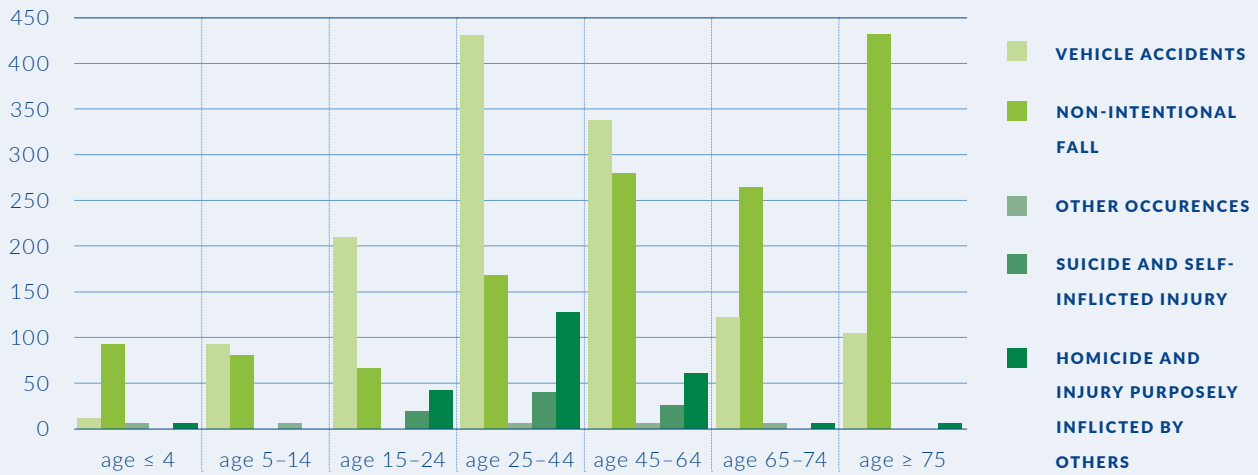
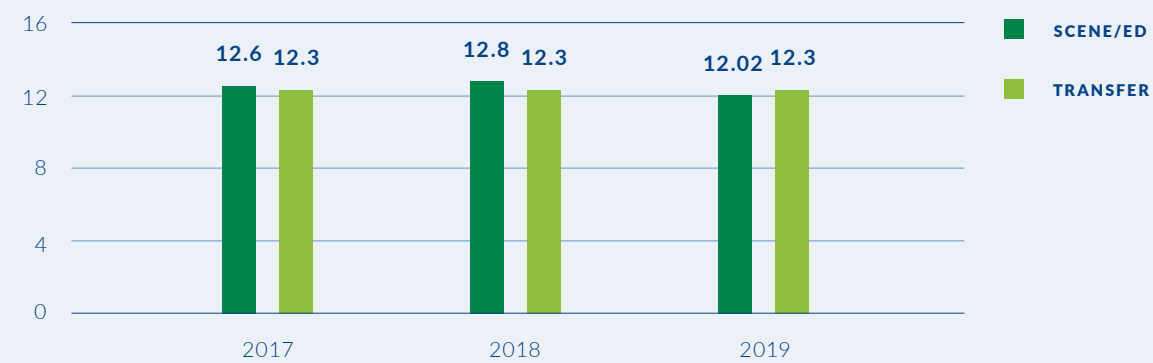


Figure 14 | Mean injury severity score of patients admitted to OHSU hospital

On average, patients transferred from other hospitals were slightly less injured than those admitted directly from the scene, representing a change from previous years. Patients were less injured overall than in previous years.



Hospital admissions via OHSU Trauma Program

In 2019, the OHSU Trauma Program admitted 2,087 patients (69%) to OHSU (Figure 15). Elderly patients were more likely to require hospital admission. Most of these patients were able to return home after admission (Figure 16).

Figure 15 | Patients requiring hospitalization after trauma team care

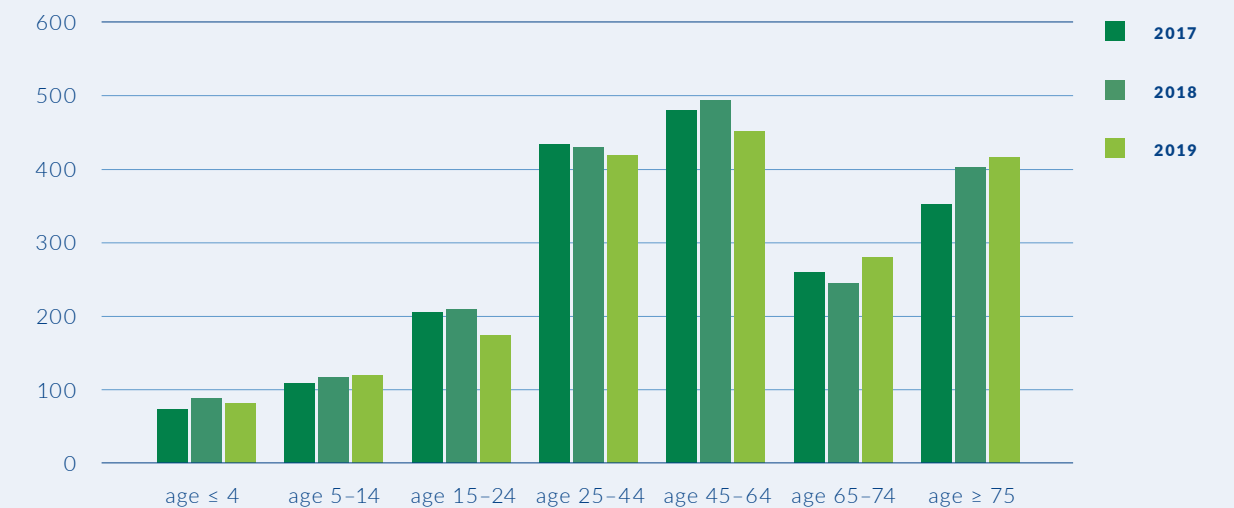
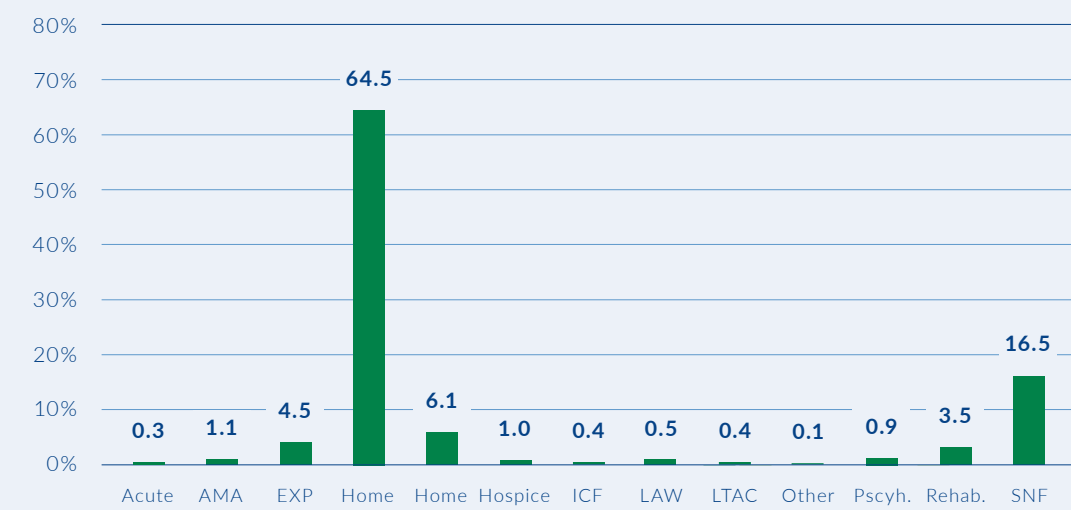


Figure 16 | Disposition of admitted patients after hospital discharge



Trauma ICU nurse Carolyn Lynnes (standing) is recognized for her years of service. ICU nurse Amanda Hostetter is at left.



Mortality

In 2019, 111 patients (3.7%) died. Six patients died in the Emergency Department and 105 died after hospital admission.

Figure 17 | Total deaths by arrival status

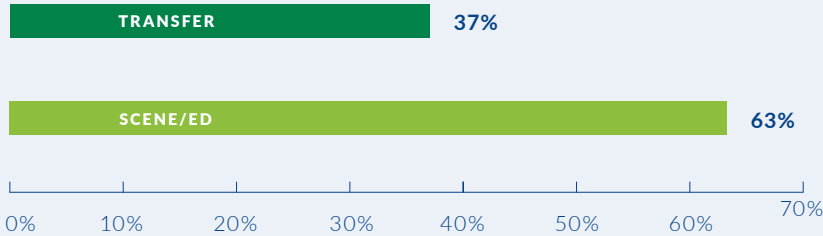
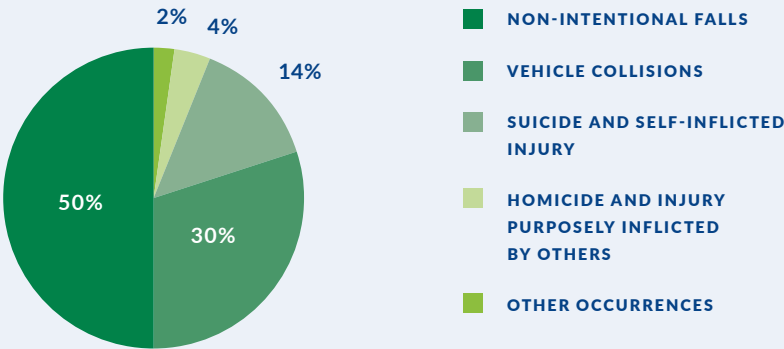


Figure 18 | Cause of death

Deaths from falls remained significantly higher than those from vehicle collisions this year.



Care for patients older than 64

In 2019, the OHSU Trauma Team treated 912 patients older than 64, a 9% increase. Of these, 492 (54%) were transferred to OHSU from another hospital or clinic. Most of the patients were injured in falls. Of the 912 injured patients, 737 (81%) required hospital admission.

Figures 19-20 provide additional information regarding trauma team care for patients older than 64 at OHSU.

Figure 19 | Patient volume, age 65 and older

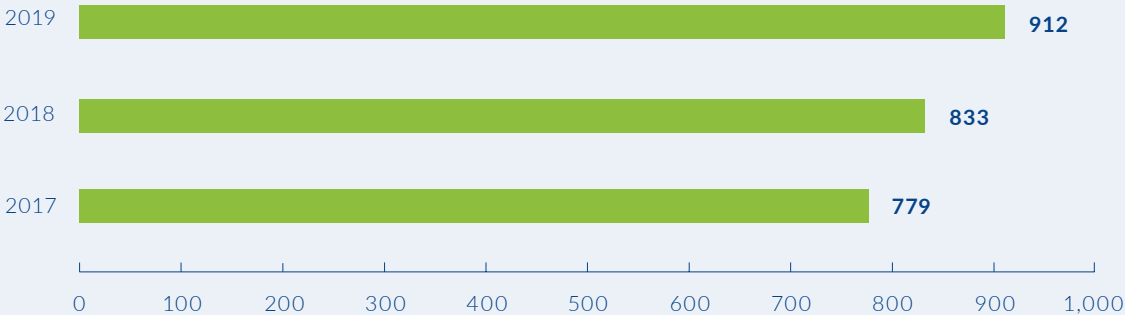
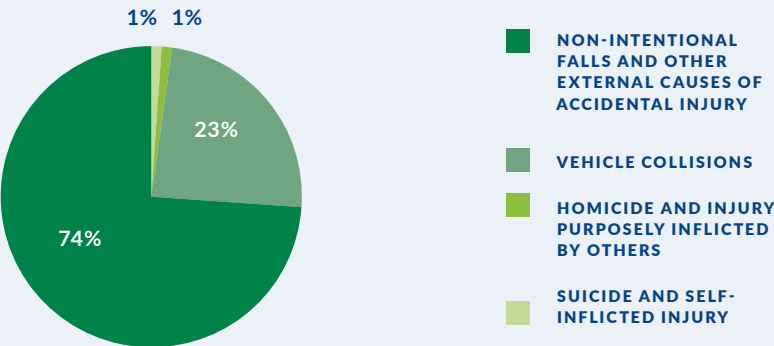


Figure 20 | Mechanism of injury, age 65 and older



OHSU Emergency Medicine physicians Dr. Matt Hansen (left) and Dr. Beech Burns (right).



Trauma ward nurses Amanda Delatorre and Trevor Connell were honored for their patient care at the anniversary gala.

Fall prevention

OHSU offers the Matter of Balance course, which is designed to reduce the fear of falling and increase activity levels among older adults. The course includes eight, two-hour sessions for a small group led by a trained facilitator. This nationally recognized program was developed at Boston University following a randomized, single-blind controlled trial. The trial tested the efficacy of a community-based group intervention to reduce fear of falling and associated restrictions in activity levels among older adults. The goals of the course are to reduce fear of falling, increase activity levels, strength and balance, and reduce fall risk factors in the environment. OHSU also offers a two-hour fall prevention seminar for those unable to commit to an eight-week course.

Table 2 | Fall prevention activities

Activity	Number of participants
Fall prevention seminar participants	68
Matter of Balance course participants	109
Coach training participants	29
Community members reached	206



Care for patients 14 years and younger

In 2019, the OHSU Trauma Team evaluated 302 patients aged 14 and younger. Of these, 193 (64%) were transferred to OHSU from hospitals around the Pacific Northwest. Patient disposition included 231 (76%) admitted to Doernbecher Children’s Hospital: 79 (34%) to the ICU, 95 (41%) to the ward, 33 (14%) to the OR, and 22 (10%) as direct admissions. Three children (1%) died as a result of their injuries.

Figure 21 | Patient volume, age 14 and younger

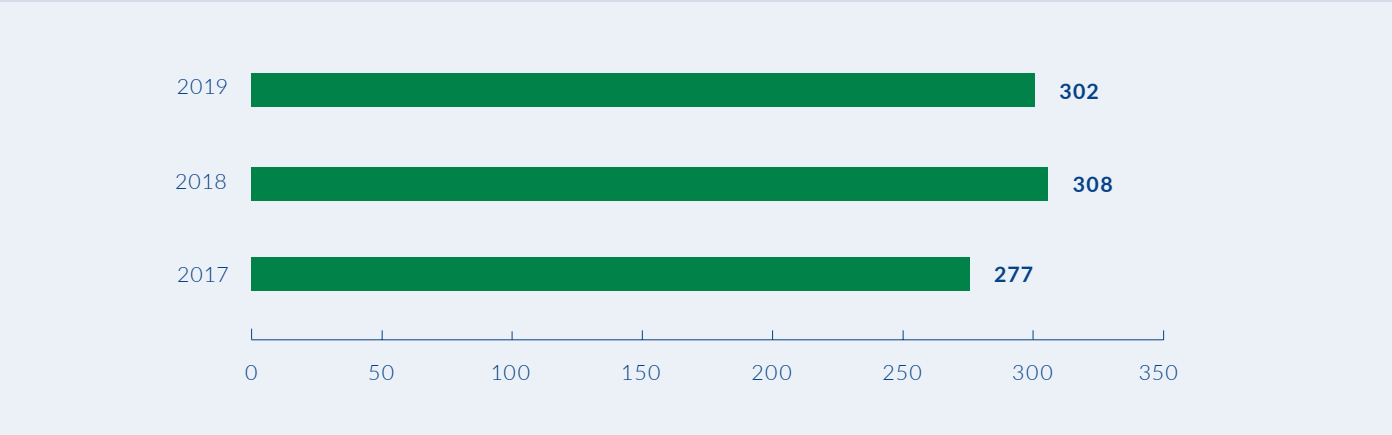


Figure 22 | Disposition from the Emergency Department, patients 14 and younger

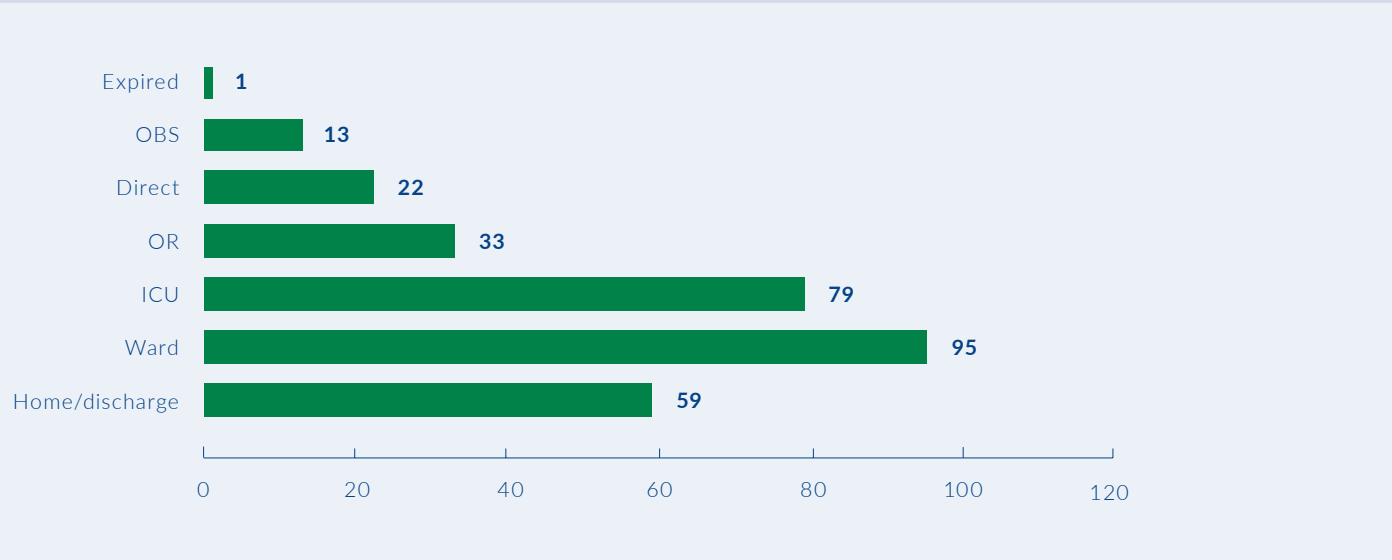


Figure 23 | Mechanism of injury, patients 14 and younger

The “other occurrences” category includes patients with sports-related injuries, those struck by a falling object, and those with injuries accidentally inflicted by others.

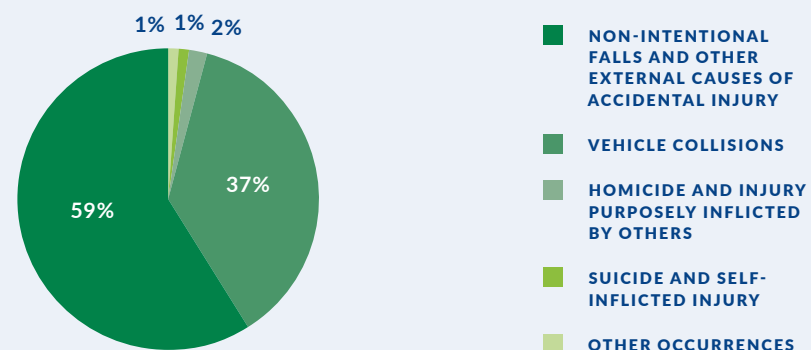
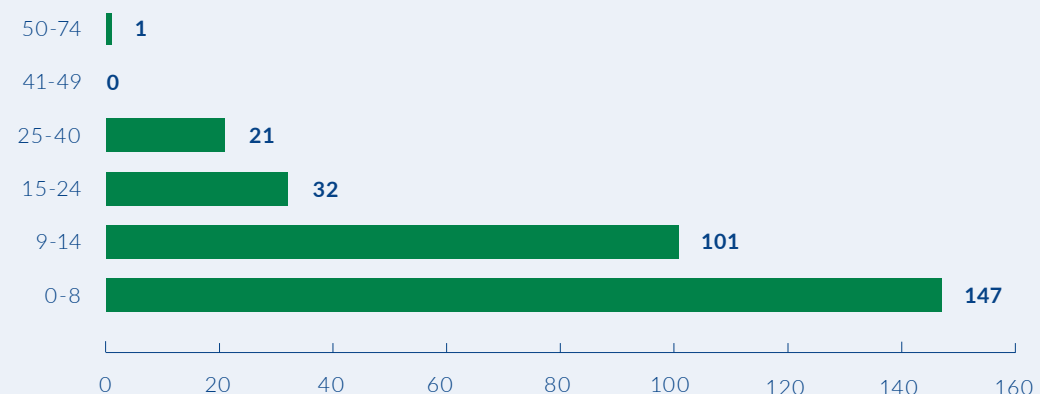


Figure 24 | Injury severity scores for patients 14 and younger



OHSU Doernbecher Children's Hospital

Pediatric injury prevention



ThinkFirst Oregon

ThinkFirst is an organization dedicated to reducing brain, spinal cord and other traumatic injuries and fatalities by educating youth, parents and community members across Oregon. ThinkFirst programs help students understand the importance and basic anatomy of the brain and spinal cord, and how a traumatic brain injury or spinal cord injury could permanently affect their lives.

ThinkFirst developed programs to provide age-appropriate injury prevention for students of all ages. ThinkFirst for Kids was developed in 1994 for grades 1-3. It provides information about the structure and function of the brain and spinal cord, motor vehicle and pedestrian safety, bicycling, water play, playgrounds, recreation and sport activities as well as teaching about the dangers of weapons and conflict resolution skills.

ThinkFirst for Youth was started in 2007. The program includes presentations and classroom curricula for grades 4-8. Anatomy lessons and classroom activities help students develop a practical understanding of their bodies' abilities, limitations and vulnerability to injuries. Exercises build communication and conflict resolution skills, increasing self-confidence and students' ability to make safe choices when on their own or in the face of peer pressure.

In 2014, ThinkFirst about Concussion was offered for teen presentations. This program teaches teenagers to prevent, recognize and respond to concussion symptoms in the context of sports and recreation. It also teaches vehicle safety, how to prevent falls and avoid violence.

Tom Sargent Safety Center

The OHSU Doernbecher Tom Sargent Safety Center is dedicated to reducing preventable injuries in children throughout the Pacific Northwest by:

- Providing public and professional education and training.
- Increasing access to low-cost safety supplies and resources.
- Encouraging health care providers, families and community leaders to get involved in finding ways to reduce injury.
- Supporting safety-related advocacy in the Pacific Northwest.

A key part of the safety center's mission is partnering with other local, state and federal agencies to promote injury prevention education. As a part of this mission, it operates a Safety Resource Center that sells low-cost home safety supplies, sport helmets and sleep sacks. Educational materials to help keep children safe at home and on the go are also available. The center offers low-cost helmets for biking, skiing and other sports and makes sure the helmets fit properly. Families can also purchase low-cost home safety gates, electrical outlet covers, cabinet latches/locks, window stops and guards, and toilet locks.

The center offers the ODOT grant to low-income families that need a car seat. This requires the family to participate in installation and positioning education. Any community family can make an appointment at the safety center to learn how to install and properly use their car seat or they can attend a weekend event that the center supports.

The Tom Sargent Safety Center has also partnered with Cribs for Kids to supply education and a low-cost Graco Pack-N-Play to any family that needs a safe place for their infant to sleep. All educational materials are available in English and Spanish, and helmet and safe sleep materials come in multiple languages. Gun trigger locks are available through Project Child Safe.



(L to R) Cari Wolverton and Adrienne Gallardo of the OHSU Doernbecher Tom Sargent Safety Center with OHSU ED nurse Cassie Richard.

Leading the way in pediatric trauma outcomes, education and outreach

Protect Our Kids: A novel program to bring critical incident training and hemorrhage control to Oregon schools

In 2019, OHSU Doernbecher Children's Hospital created The Protect Our Kids campaign in partnership with Portland Public Schools and Portland Police Bureau, funded through a generous grant from the Pediatric Trauma Society and Childress Institute for Pediatric Trauma. This program integrates Critical Incident Training, which includes active shooter education with other mass casualty events provided by law enforcement. Our OHSU Doernbecher team provided Stop the Bleed for educators and staff at Portland elementary and middle schools.

A large group of physicians, advance practice providers and nurses from OHSU Doernbecher and several school resource officers from the Portland Police Bureau led the programs. Divided into three teams, the leaders delivered the education to most of the schools over three days at the end of August 2019, during the teacher education period before the start of the school year. The three teams visited four schools per team (total 12 schools/day) on each of the three education days (36 schools). Over the three days, 1,019 educators and assistants enrolled in the program. Ninety-eight percent of trainees and all of the trainers involved in the pilot program rated the program as excellent (9 or 10 on a 10-point Likert scale). Each school that participated in the training received three Stop the Bleed hemorrhage control kits, containing hemorrhage control gauze, gloves, shears and four tourniquets. The OHSU Doernbecher team will continue this work in the 2020 academic year.



At right, Lori Moss, Pediatric Trauma Program manager, teaches Stop the Bleed to Portland Public Schools staff.

Pediatric Critical Care and Neurotrauma Recovery Program

Combining the neurological and physical needs of the pediatric trauma patient after discharge

Children who receive trauma care in our facility may need additional healing when they leave OHSU Doernbecher (DCH) and often require trauma follow-up related to surgical interventions or medical management. Often cognitive or behavioral conditions are identified at the trauma follow-up visit and require specialized referrals for treatment to teams specializing in the pediatric and adolescent mind. In 2019, the DCH Trauma Program sought out a partnership with the DCH Neurocritical Care (NCC) Team to combine the trauma clinic followup with a NCC visit, launching the Pediatric Critical Care & Neurotrauma Recovery Program (PCCNTRP).

All patients coming to DCH for trauma care are referred to the PCCNTRP while they are inpatient. A neurocritical care attending and a neurophysiologist evaluate the patients to establish baseline data and guide inpatient coping. Once a patient is ready for discharge, they are scheduled into the PCCNTRP, where they will receive ongoing cognitive and behavioral evaluation, address return-to-school needs and monitor for post-traumatic stress disorder as well as an evaluation by a pediatric trauma nurse practitioner.

The goal of this venture is to reduce the number of visits required for followup and to better integrate neurocognitive care in the pediatric trauma patient. This approach has been so successful that our adult trauma counterparts have requested similar access to the program. The PCCNTRP now sees all OHSU adult patients to the age of 21 years.

Statewide Child Passenger Safety Instructor Development Grant

Coordinate staffing for Child Passenger Safety Technician trainings throughout Oregon

The OHSU Doernbecher Tom Sargent Safety Center (TSSC) was awarded the Statewide Child Passenger Safety (CPS) Instructor Development and Technician Training Grant in October 2019. This grant from the Oregon Department of Transportation Safety Division recognizes the TSSC as the NHTSA-State Child Passenger Safety Training Coordinator.

Responsibilities of this grant require the TSSC to provide administrative and instructional support to coordinate staffing for Child Passenger Safety Technician trainings throughout Oregon. This includes providing CPS Technician certification courses, continuing education units, certification renewal opportunities and community education workshops to meet the training needs of all Oregon CPS Technicians.

NHTSA reports misuse data as 3 out of 4 car seats are installed incorrectly, and a study conducted by OHSU Doernbecher TSSC in 2015 reported 95% of families discharging from OHSU Mother Baby Unit had serious misuse of child safety seat at time of discharge.

With the knowledge of this data, the TSSC takes a proactive approach locally and across the state to help children, one of the most vulnerable sections of our population. The TSSC team provides inpatient hospital education and works with partners to educate and certify technicians to strengthen community outreach, thereby supporting safe travel for all of Oregon’s children.

Research

In 2019, the Trauma Research Laboratory continued to receive funding from the Department of Defense, National Institutes of Health, foundations and industry to bring the overall research funding to \$17 million for the year. The research group continues to work with consortiums, such as LITES, SIREN and CLOTT, with additional studies beginning in 2020. The LITES consortium will have new and continuing task orders in 2020, while the current SIREN and CLOTT studies will continue into 2020.

Newly funded projects for 2019 included “A Wider View: Understanding and predicting the hidden mortality of trauma patients after discharge.” Mackenzie Cook, M.D. received funding from the Medical Research Foundation of Oregon to evaluate and understand a patient’s risk for death within a year of injury. James D. Ross, Ph.D. continues to work with Critical Innovations to evaluate systems to help treat patients with traumatic brain injury and thoracic injuries.

The Trauma Research Laboratory remained active with human subjects and animal research in 2019.

Interventional and observational trials involving trauma patients admitted to OHSU were led by Martin Schreiber, M.D., Laszlo Kiraly, M.D., David Zonies, M.D., Mackenzie Cook, M.D. and Cassie Barton, PharmD.

- Shock, Whole Blood and Assessment of TBI (SWAT)
- The Pathogenesis of Post-Traumatic Pulmonary Embolism: A Prospective Multicenter Investigation by the CLOTT Study Group
- Randomized Trial of Early Hemodynamic Management of Patients following Acute Spinal Cord Injury (TEMPLE)
- Multi-Institutional Trial of the Injured Trauma Survivor Screen (MITSS)
- A Prospective Randomized Trial Comparing Two Standard Doses of Enoxaparin for the Prevention of Thromboembolism in Trauma Patients
- Effect on Platelet Mapping on Antiplatelet Use and Platelet Transfusion in Patients with Traumatic Injuries

Animal trials directed by Martin Schreiber, M.D. and James Ross, Ph.D. included the following studies in swine:

- Mesenchymal Stem Cells for the Prevention of Acute Respiratory Distress Syndrome after Pulmonary Contusion and Hemorrhagic Shock
- Prothrombin Complex Concentrate for the Prevention of Acute Respiratory Distress Syndrome after Pulmonary Contusion
- Selective Aortic Arch Perfusion – Provider Training
- Extracorporeal Life Support and Therapeutic Hypothermia for Cardiac Tamponade
- Potassium Adsorbing Polymers for the Treatment of Trauma-induced Hyperkalemia and Acute Kidney Injury in Austere Medicine

Karen Brasel, M.D. and Craig Newgard, M.D. continued their work on the National Trauma Research Action Plan (NTRAP) to prioritize a comprehensive research agenda, identify gaps in federal funding and identify regulatory barriers in trauma research.

Residents Sawyer Smith, M.D. and Christian Crannell, M.D. completed their research year in the lab in June. Both continue to work on research projects. To wrap his work on the swine studies in Dr. Schreiber’s lab, Dr. Smith won the best resident paper at North Pacific Surgical Association in November for his paper titled, “Aggressive treatment of acute kidney injury and hyperkalemia improves survival in a combat relevant model for trauma-induced acute lung injury in swine.”

Alix Dixon, M.D. and Shannon Howard, M.D. joined the lab in July and jumped right into their research projects. Dr. Dixon won best resident paper at the Region X Committee on Trauma for her paper titled, “Thrombelastography does not detect fibrinolytic inhibition following treatment with tranexamic acid.” Dr. Dixon also won best resident paper at the Pacific Coast Surgical Association for her paper titled, “Variation in Management of Pediatric Blunt Splenic Trauma in Oregon.” Dr. Howard became a Surgical Education Research Fellow with the Association of Surgical Education.

The research group concluded enrollment in the Cannabis and Motor Vehicle Collision study with Esther Choo, M.D. and Karen Brasel, M.D. The group also concluded Dr. Brasel’s study with University of Wisconsin evaluating communication between trauma patients, their families and the treatment team.

Belinda McCully, Ph.D. completed her animal study in collaboration with the University of Oregon to study the vascular mechanisms linking obesity and hypercoagulability after traumatic hemorrhage.

Laszlo Kiraly, M.D. and Robert Martindale, M.D. also completed their project with the University of Oregon looking at predicting health care-associated Clostridioides difficile infection based on hospital unit and overall location of the unit within the hospital. The group is pursuing additional funding from the NIH to continue their investigations.

Publications in 2019

1. 10 years of laparoscopic common bile duct exploration: A single tertiary institution experience.
Ballou J, Wang Y, Schreiber M, Kiraly L.
Am J Surg. 2019 May;217(5):970-973. doi: 10.1016/j.amjsurg.2019.03.006. Epub 2019 Mar 26.
PMID: 30935666 [PubMed - indexed for MEDLINE]
2. Appendicitis in Pregnancy: A Post-Hoc Analysis of an EAST Multicenter Study.
Vasileiou G, Eid Al Qian S, Pust GD, Rattan R, Naimias N, Laretzakis A, Kaafarani HMA, Yeh DD
Surg Infect (Larchmt). 2020 Apr;21(3):205-211. doi: 10.1089/sur.2019.102. Epub 2019 Nov 5. PMID: 31687887.
3. Assessing the Value of Endoscopy Simulator Modules Designed to Prepare Residents for the Fundamentals of Endoscopic Surgery Examination.
Byrne RM, Hoops HE, Herzig DO, Diamond SJ, Lu KC, Brasel KJ, Tsikitis VL.
Dis Colon Rectum. 2019 Feb;62(2):211-216. doi: 10.1097/DCR.0000000000001291.
PMID: 30540663 [PubMed - indexed for MEDLINE]
4. Authors Response to Commentary on our Manuscript.
Cook MR, Cuschieri J.
J Trauma Acute Care Surg. 2019 Mar;86(3):554-555. doi: 10.1097/TA.0000000000002131. No abstract available.
PMID: 30444860 [PubMed - in process]
5. Barriers to Clinical Research in Trauma Transfusion
Miskimins R, Pati S, Schreiber M.
Transfusion. 2019 Feb, 59(S1):846-853. doi: 10.1136/emered-2019-208690.
PMID: 31641038
6. Bone Marrow Donor Selection and Characterization of MSCs is Critical for Pre-clinical and Clinical Cell Dose Production.
Trivedi A, Miyazawa B, Gibb S, Valanoski K, Vivona L, Lin M, Potter D, Stone M, Norris PJ, Murphy J, Smith S, Schreiber M.
Journal of Translational Medicine. 2019;17:128. doi: 10.1186/s12967-019-1877-4.
PMID: 30995929
7. Consumption of Alcohol Leads to Platelet Inhibition in Men.
Smith S, Fair K, Goodman A, Watson J, Dodgion C, Schreiber M.
American Journal of Surgery 2019;217:868 – 872. doi: 10.1016/j.amjsurg.2019.02.020. Epub 2019 Feb 23.
PMID: 30826005
8. Deceased organ donor factors influencing pancreatic graft transplantation and survival.
Sally MB, Ellis MK, Hutchens M, Groat T, Swanson E, Patel MS, Niemann CU, Malinoski DJ.
Clin Transplant. 2019 Jun;33(6):e13571. doi: 10.1111/ctr.13571.
PMID: 31001850 [PubMed - in process]

9. Detecting PTSD in a traumatically injured population: The diagnostic utility of the PTSD Checklist for DSM-5. Geier TJ, Hunt JC, Nelson LD, Brasel KJ, deRoos-Cassini TA. Depress Anxiety. 2019 Feb;36(2):170-178. doi: 10.1002/da.22873. Epub 2018 Dec 30. PMID: 30597679 [PubMed - indexed for MEDLINE]
10. Development of an Assessment Tool for Surgeons in Their First Year of Independent Practice: The Junior Surgeon Performance Assessment Tool. Hoops HE, Deveney KE, Brasel KJ. J Surg Educ. 2019 Nov - Dec;76(6):e199-e208. doi: 10.1016/j.jsurg.2019.08.001. Epub 2019 Aug 14. PMID: 31420272 [PubMed - in process]
11. Earlier time to hemostasis is associated with decreased mortality and rate of complications: Results from the Pragmatic Randomized Optimal Platelet and Plasma Ratio trial. Chang R, Kerby JD, Kalkwarf KJ, Van Belle G, Fox EE, Cotton BA, Cohen MJ, Schreiber MA, Brasel K, Bulger EM, Inaba K, Rizoli S, Podbielski JM, Wade CE, Holcomb JB; PROPPR Study Group. J Trauma Acute Care Surg. 2019 Aug;87(2):342-349. doi: 10.1097/TA.0000000000002263. PMID: 31349348 [PubMed - indexed for MEDLINE]
12. Early Neuromuscular Blockade in the Acute Respiratory Distress Syndrome. Moss M, Huang DT, Brower RG, Ferguson ND, Ginde AA, Gong MN, Grissom CK, Grundel S, Hayden D, Hite RD, Hou PC, Hough CL, Iwasyna, Khan A, Lik KD, Talmor D, Thompson BT, Ulysse CA, Yealy DM, Angus DC. National Heart, Lung and Blood Institute PETAL Clinical Trials Network. N Engl J Med. 2019 Aug 22;381(8):787-788. doi: 10.1056/NEJMc1908874. PMID: 31433935.
13. Early versus late venous thromboembolism: A secondary analysis of data from the PROPPR trial. Myers SP, Brown JB, Leeper CM, Kutcher ME, Chen X, Wade CE, Holcomb JB, Schreiber MA, Cardenas JC, Rosengart MR, Neal MD; PROPPR study group. Surgery. 2019 Sep;166(3):416-422. doi: 10.1016/j.surg.2019.04.014. Epub 2019 Jun 21. PMID: 31230842 [PubMed - indexed for MEDLINE]
14. Effectiveness of a Question Prompt List Intervention for Older Patients Considering Major Surgery: A Multisite Randomized Clinical Trial. Schwarze ML, Buffington A, Tucholka JL, Hanlon B, Rathouz PJ, Marka N, Taylor LJ, Zimmermann CJ, Kata A, Baggett ND, Fox DA, Schmick AE, Berlin A, Glass NE, Mosenthal AC, Finlayson E, Cooper Z, Brasel KJ. JAMA Surg. 2019 Oct 30. doi: 10.1001/jamasurg.2019.3778. [Epub ahead of print] PMID: 31664452 [PubMed - as supplied by publisher]
15. Efficacy of a Novel Surgical Manikin for Simulating Emergency Surgical Procedures. Garcia DFV, Domingues CA, Collet E Silva FS, Mori ND, Brasel KJ, Kortbeek J, Ali J, Poggetti RS. Am Surg. 2019 Dec 1;85(12):1318-1326. PMID: 31908212 [PubMed - indexed for MEDLINE]
16. Efficacy of Prehospital Criteria in Identifying Trauma Patients Susceptible to Undertriage. Smith SG, Dewey EN, Eastes LE, Schreiber MA. JAMA Surg. 2019 Aug 7. doi: 10.1001/jamasurg.2019.2497. [Epub ahead of print] No abstract available. PMID: 31389977 [PubMed - as supplied by publisher]
17. Elderly patients presenting to a Level I trauma center with Physician Orders for a Life-Sustaining Treatment form: A propensity-matched analysis. Ballou JH, Dewey EN, Zonies DH. J Trauma Acute Care Surg. 2019 Jul;87(1):153-160. doi: 10.1097/TA.0000000000002321. PMID: 31033897 [PubMed - indexed for MEDLINE]
18. Entrustable Professional Activities in General Surgery: Development and Implementation. Brasel KJ, Klingensmith ME, Englander R, Grambau M, Buyske J, Sarosi G, Minter R. J Surg Educ. 2019 Sep - Oct;76(5):1174-1186. doi: 10.1016/j.jsurg.2019.04.003. Epub 2019 Apr 25. PMID: 31029575 [PubMed - in process]
19. Extracorporeal potassium binding for the management of hyperkalemia in an anephric model of crush injury. Hoareau GL, Beyer CA, Wilson C, Kashtan H, Wishy A, Grayson JK, Walker L, Ross JD, Stewart IJ. J Trauma Acute Care Surg. 2019 Apr;86(4):694-701. doi: 10.1097/TA.0000000000002178. PMID: 30633103 [PubMed - in process]
20. Factors influencing amount of guidance in the operating room during laparoscopic cases. Hoops HE, Haley C, Cook MR, Lopez O, Dewey E, Brasel KJ, Spight D, Kiraly LN. Am J Surg. 2019 May;217(5):979-985. doi: 10.1016/j.amjsurg.2019.03.019. Epub 2019 Mar 22. PMID: 30929750 [PubMed - indexed for MEDLINE]
21. γ' fibrinogen levels are associated with blood clot strength in traumatic brain injury patients. Farrell DH, Rick EA, Dewey EN, Schreiber MA, Rowell SE. Am J Surg. 2019 Dec 28. pii: S0002-9610(19)31583-1. doi: 10.1016/j.amjsurg.2019.12.028. [Epub ahead of print] PMID: 31948701 [PubMed - as supplied by publisher]
22. Fibrinolytic Activation in Patients with Progressive Intracranial Hemorrhage after Traumatic Brain Injury. Fair K, Farrell D, McCully B, Rick E, Dewey EN, Hilliard C, Dean R, Lin AL, Hinson HE, Barbosa RR, Schreiber M, Rowell SE. J Neurotrauma. 2019 Aug 6. doi: 10.1089/neu.2018.6234. [Epub ahead of print] PMID: 31382848 [PubMed - as supplied by publisher]
23. The focused assessment with sonography in trauma (FAST) in hypotensive injured patients frequently fails to identify the need for laparotomy: a multi-institutional pragmatic study. Rowell SE, Barbosa RR, Holcomb JB, Fox EE, Barton CA, Schreiber MA. Trauma Surg Acute Care Open. 2019 Jan 24;4(1):e000207. doi: 10.1136/tsaco-2018-000207. eCollection 2019. PMID: 30793035 [PubMed]
24. Goals of Care: Understanding the Outcomes that Matter Most. Cook MR. Surg Clin North Am. 2019 Oct;99(5):833-847. doi: 10.1016/j.suc.2019.06.005. Epub 2019 Jul 12. Review. PMID: 31446912 [PubMed - indexed for MEDLINE]
25. The impact of hypothermia on outcomes in massively transfused patients. Lester ELW, Fox EE, Holcomb JB, Brasel KJ, Bulger EM, Cohen MJ, Cotton BA, Fabian TC, Kerby JD, O'Keefe T, Rizoli SB, Scalea TM, Schreiber MA, Inaba K; PROPPR study group. J Trauma Acute Care Surg. 2019 Mar;86(3):458-463. doi: 10.1097/TA.0000000000002144. PMID: 30444856 [PubMed - in process]

26. The Impact of Therapeutic Hypothermia Used to Treat Anoxic Brain Injury After Cardiopulmonary Resuscitation on Organ Donation Outcomes.
Wright C, Patel MS, Gao X, Witt M, Sally M, Groat T, Crutchfield M, Neidlinger N, Pilot M, Malinoski DJ; Organ Donation Research Consortium (ODRC) Anoxic Organ Donor Study Group.
Ther Hypothermia Temp Manag. 2019 Dec;9(4):258-264. doi: 10.1089/ther.2018.0043. Epub 2019 Mar 8.
PMID: 30848704 [PubMed - in process]
27. Implementation of a medical coding curriculum for surgery residents.
Kelley KA, Hoops HE, Palmer L, Cohen NA, Brasel KJ.
Am J Surg. 2019 May;217(5):834-838. doi: 10.1016/j.amjsurg.2019.02.027. Epub 2019 Mar 4.
PMID: 30879797 [PubMed - indexed for MEDLINE]
28. Introduction to the Supplement on Cellular Therapies in Trauma in Trauma and Critical Care Medicine.
Pati S, Schreiber M, Rappold J.
Transfusion. 2019;59:831-833. doi: 10.1111/trf.15148.
PMID: 30737819
29. Management of penetrating intraperitoneal colon injuries: A meta-analysis and practice management guideline from the Eastern Association for the Surgery of Trauma.
Cullinane DC, Jawa RS, Como JJ, Moore AE, Morris DS, Cheriyan J, Guillamondegui OD, Goldberg SR, Petrey L, Schaefer GP, Khwaja KA, Rowell SE, Barbosa RR, Bass GA, Kasotakis G, Robinson BRH.
J Trauma Acute Care Surg. 2019 Mar;86(3):505-515. doi: 10.1097/TA.0000000000002146.
PMID: 30789470 [PubMed - in process]
30. Massive Transfusion of Low-titer Cold-stored Whole Blood in A Civilian Trauma Setting.
Condron M, Scanlan, Schreiber M.
Transfusion. 2019 Mar;59(3):927-930. doi: 10.1111/trf.15091. Epub 2018 Dec 27.
PMID: 30592054
31. Older Blood is Associated with Increased Mortality and Adverse Events in Massively Transfused Patients: Secondary Analysis of the PROPPR Trial.
Jones AR, Patel RP, Marques MB, Donnelly JP, Griffin RL, Pittet JF, Kerby JD, Stephens SW, Desantis SM, Hess JR, Wang HE.
PROPPR Study Group.
Annals of Emergency Medicine. 2019 Jun;73(6):650-661. doi: 10.1016/j.annemergmed.2018.09.033. Epub 2018 Nov 15.
PMID: 30447946
32. Palliative Care and Geriatric Surgery.
Ballou JH, Brasel KJ.
Clin Geriatr Med. 2019 Feb;35(1):35-44. doi: 10.1016/j.cger.2018.08.004. Epub 2018 Sep 28. Review.
PMID: 30390982 [PubMed - indexed for MEDLINE]
33. Protocolized Warfain Reversal with 4-Factor Prothrombin Complex Concentrate Versus 3-Factor Prothrombin Complex Concentrate with Recombinant Factor VIIa.
Barton CA, Hom M, Johnson NB, Case J, Ran R, Schreiber M
American Journal of Surgery. 2018;215:775 – 779. doi: 10.1016/j.amjsurg.2017.12.011. Epub 2018 Jan 5.
PMID: 29338845
34. Regulation of endothelial cell permeability by platelet-derived extracellular vesicles.
Miyazawa B, Trivedi A, Togarrati PP, Potter D, Baimukanova G, Vivona L, Lin M, Lopez E, Callcut R, Srivastava AK, Kornblith LZ, Fields AT, Schreiber MA, Wade CE, Holcomb JB, Pati S.
J Trauma Acute Care Surg. 2019 Jun;86(6):931-942. doi: 10.1097/TA.0000000000002230.
PMID: 31124890 [PubMed - in process]
35. Resident autonomy in the operating room: Does gender matter?
Hoops H, Heston A, Dewey E, Spight D, Brasel K, Kiraly L.
Am J Surg. 2019 Feb;217(2):301-305. doi: 10.1016/j.amjsurg.2018.12.023. Epub 2018 Dec 15.
PMID: 30580935 [PubMed - indexed for MEDLINE]
36. Resilience and long-term outcomes after trauma: An opportunity for early intervention?
Nehra D, Herrera-Escobar JP, Al Rafai SS, Havens J, Askari R, Nitzschke S, Velmahos G, Kasotakis G, Brasel KJ, Levy-Carrick N, Salim A, Haider A.
J Trauma Acute Care Surg. 2019 Oct;87(4):782-789. doi: 10.1097/TA.0000000000002442.
PMID: 31589192 [PubMed - in process]
37. Rural surgeons' perspectives on necessity of post-residency training are stable across generations.
Hughes D, Cook MR, Deal SB, Hughes TG, Sarap M, Brasel K, Alseidi A.
Am J Surg. 2019 Feb;217(2):296-300. doi: 10.1016/j.amjsurg.2018.11.026. Epub 2018 Nov 30.
PMID: 30528820 [PubMed - indexed for MEDLINE]
38. Screening and treating hospitalized trauma survivors for posttraumatic stress disorder and depression.
deRoos-Cassini TA, Hunt JC, Geier TJ, Warren AM, Ruggiero KJ, Scott K, George J, Halling M, Jurkovich G, Fakhry SM, Zatzick D, Brasel KJ.
J Trauma Acute Care Surg. 2019 Aug;87(2):440-450. doi: 10.1097/TA.0000000000002370. Review.
PMID: 31348404 [PubMed - indexed for MEDLINE]
39. Selective aortic arch perfusion with fresh whole blood or HBOC-201 reverses hemorrhage-induced traumatic cardiac arrest in a lethal model of noncompressible torso hemorrhage.
Hoops HE, Manning JE, Graham TL, McCully BH, McCurdy SL, Ross JD.
J Trauma Acute Care Surg. 2019 Aug;87(2):263-273. doi: 10.1097/TA.0000000000002315.
PMID: 31348400 [PubMed - indexed for MEDLINE].
40. Structure and function of a trauma intensive care unit: A report from the Trauma Intensive Care Unit Prevalence Project.
Michetti CP, Fakhry SM, Brasel K, Martin ND, Teicher EJ, Liu C, Newcomb A; TRIPP Study Group.
J Trauma Acute Care Surg. 2019 May;86(5):783-790. doi: 10.1097/TA.0000000000002223.
PMID: 30741885 [PubMed - in process]
41. Surgical Palliative Care Education.
Ballou JH, Brasel KJ.
Surg Clin North Am. 2019 Oct;99(5):1037-1049. doi: 10.1016/j.suc.2019.06.016. Epub 2019 Jul 30. Review.
PMID: 31446909 [PubMed - indexed for MEDLINE]
42. Surgical palliative care training in general surgery residency: An educational needs assessment.
Bonanno AM, Kiraly LN, Siegel TR, Brasel KJ, Cook MR.
Am J Surg. 2019 May;217(5):928-931. doi: 10.1016/j.amjsurg.2019.01.008. Epub 2019 Jan 17.
PMID: 30678805 [PubMed - indexed for MEDLINE]

43. TEG Lysis Shutdown Represents Coagulopathy in Bleeding Trauma Patients: Analysis of the PROPPR Cohort. Cardenas JC, Wade CE, Cotton Ba, George MJ, Holcomb JB, Schreiber MA, White NJ; PROPPR Study Group. Shock. 2019 Dec;52(6):639-640. doi: 10.1097/SHK.0000000000001341. PMID: 30855518.

44. The “Top 10” Research and Development Priorities for Battlefield Surgical Care: Results from the Committee on Surgical Combat Casualty Care Research Gap Analysis. Martin MJ, Holcomb J, Polk T, Hannon , Eastridge B, Malik SZ, Blackman V, Galante JM, Grabo D, Schreiber M, Gurney J, Butler FK, Shackelford S. J Trauma Acute Care Surg. 2019 Jul;87(1S Suppl 1):S14-S21. doi: 10.1097/TA.0000000000002200. PMID: 31246901.

45. Trauma ICU Prevalence Project: the diversity of surgical critical care. Michetti CP, Fakhry SM, Brasel K, Martin ND, Teicher EJ, Newcomb A; TRIPP study group. Trauma Surg Acute Care Open. 2019 Feb 18;4(1):e000288. doi: 10.1136/tsaco-2018-000288. eCollection 2019. PMID: 30899799 [PubMed] Free PMC Article

46. Trauma Surgeon and Palliative Care Physician Attitudes Regarding Goals-of-Care Delineation for Injured Geriatric Patients. Cunningham HB, Scielzo SA, Nakonezny PA, Bruns BR, Brasel KJ, Inaba K, Brakenridge SC, Kerby JD, Joseph BA, Mohler MJ, Cuschieri J, Paulk ME, Ekeh AP, Madni TD, Taveras LR, Imran JB, Wolf SE, Phelan HA. Am J Hosp Palliat Care. 2019 Aug;36(8):669-674. doi: 10.1177/1049909118823182. Epub 2019 Jan 6. PMID: 30614253 [PubMed - indexed for MEDLINE]

47. When Rural is no Longer Rural: Demand for Subspecialty Trained Surgeons Increases with Increasing Population of a Non-metropolitan Area. Cook MR, Hughes D, Deal SB, Sarap MD, Hughes TG, Deveney KE, Brasel KJ, Alseidi AA. Am J Surg. 2019 Nov;218(5):1022-1027. doi: 10.1016/j.amjsurg.2019.06.004. Epub 2019 Jun 12. PMID: 31227187 [PubMed - indexed for MEDLINE]

In memoriam



Donald D. Trunkey, M.D., attended Washington State University for his undergraduate degree and then went on to medical school at the University of Washington, receiving his medical degree in 1963. Uncertain about medicine or surgery as a career, Dr. Trunkey chose a rotating internship at the University of Oregon School of Medicine. After one month on the surgical service, he had no questions about what career to pursue.

Following his internship, Dr. Trunkey spent two years in the U.S. Army as a general medical officer in Germany. Upon completion of his military duties, he finished his general surgical training at the University of California, San Francisco. Dr. Trunkey then spent an additional year at the University of Texas Southwestern Medical School in Dallas, where he was involved in a NIH special fellowship in trauma.

In 1972, Dr. Trunkey returned to UCSF as a member of the faculty and became involved in the care of trauma patients. He was Chief of the Burn Center and had an extensive interest in elective vascular and noncardiac thoracic surgery. He also established a laboratory to study mechanisms of shock at the cellular level.

After eight years as Chief of Surgery at San Francisco General Hospital, Dr. Trunkey assumed the position of Professor and Chairman of the Department of Surgery at the OHSU School of Medicine in 1986, a position he held until 2001.

Five years into his term leading the department in Oregon, the Army activated Dr. Trunkey to serve in Desert Storm as the commander of the U.S. Army hospital in Riyadh, Saudi Arabia. After his return, he wrote a commentary, “Lessons Learned,” that enumerated changes the U.S. Department of Defense should make to improve trauma care in the military. Many of his recommendations were adopted and are still in use.

In 2008, Dr. Trunkey was awarded the King Faisal Prize in Medicine. In 2018, the American College of Surgeons honored him as an “Icon in Surgery.”

Dr. Trunkey died on May 1, 2019 after a protracted illness.

Trauma Faculty



Martin Schreiber, M.D., Chief of Trauma

Speaking topics: Transfusion; resuscitation; what you need to know about DVTs; lessons learned in the war on terror; modern methods of hemorrhage control; blast injury; novel blood products; modulation of coagulation; thromboelastometry and trauma



Karen Brasel, M.D., M.P.H.

Speaking topics: Post-traumatic stress disorder; ethics in trauma



Albert Chi, M.D.

Speaking topics: Targeted muscle re-innervation and advanced prosthetics



Mackenzie Cook, M.D.

Speaking topics: Long-term outcomes after injury; curriculum development in surgical education and optimizing autonomy for trainees



Arvin Gee, M.D.

Speaking topics: Utilizing minimally invasive surgical techniques in trauma and emergency general surgery; management of appendicitis and diverticulitis



Bruce Ham, M.D.

Speaking topics: Rural trauma team development course; rural trauma, rib fractures



Nick Jaszczak, M.D.

Speaking topics: Rural trauma team development course; general trauma



Laszlo Kiraly, M.D.

Speaking topics: Surgical nutrition; education of medical students and residents



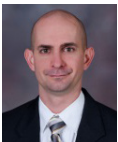
Darren Malinoski, M.D.

Speaking topics: General trauma; organ donation



Bradley Rittenhouse, M.D.

Speaking topics: Military trauma care; general trauma



Mitch Sally, M.D.

Speaking topics: Inflammation and response to injury; organ donation; mechanical ventilation



Phil Van, M.D.

Speaking topics: Military trauma care; general trauma



David Zonies, M.D.

Speaking topics: ECMO; military trauma care; advanced ventilator management

Trauma Advanced Practice Providers



Kristy Aghayan

Trauma physician assistant



Diana Clapp

Trauma nurse practitioner



Staci Colovos

Trauma nurse practitioner



Laura Dillon

Trauma physician assistant



Lynn Eastes, M.S., RN, ACNP-BC

Trauma nurse practitioner



Erica Gibson

Trauma nurse practitioner



Lauren Greenfield,

Trauma physician assistant



Mindy Hamilton

Trauma physician assistant



Kristen Haynes

Trauma nurse practitioner



Jessica Jurkovich

Trauma nurse practitioner



Nicole Kirker

Trauma nurse practitioner



Ryan McMahon

Trauma physician assistant



Emma Schaus

Trauma physician assistant



Scott Sherry

Emergency General Surgery physician assistant



Michelle Simons

Trauma nurse practitioner



Amanda Staudt

Trauma nurse practitioner



Jake Wheeler

Trauma physician assistant

Pediatric Trauma Faculty



Kenneth Azarow, M.D.



Marilyn Butler, M.D.



Elizabeth Fialkowski, M.D.



Cynthia Gingalewski, M.D.



Nick Hamilton, M.D.



Margo Hendrickson, M.D.



Mubeen Jafri, M.D.



Sanjay Krishnaswami, M.D.



Katrine Lofberg, M.D.



Andrew Zigman, M.D.

Trauma Nursing Faculty



Pam Bilyeu, MN, RN, TCRN

Trauma program manager



Jody Berryhill, BSN, RN

Trauma coordinator



Lori Moss, BSN, RN, CCRN

Pediatric trauma program manager

OHSU Trauma Program

Mail Code: L604

3181 S.W. Sam Jackson Park Road

Portland, OR 97239-3098

Tel: 503 494-6007

Fax: 503 494-4357

www.ohsu.edu/trauma



OHSU accepts most health plans.

OHSU is an equal opportunity, affirmative action institution.

FFS 21680339 7/20