

VOLUME 6

2022

ANNUAL TRAUMA REPORT

Sky Lakes Medical Center



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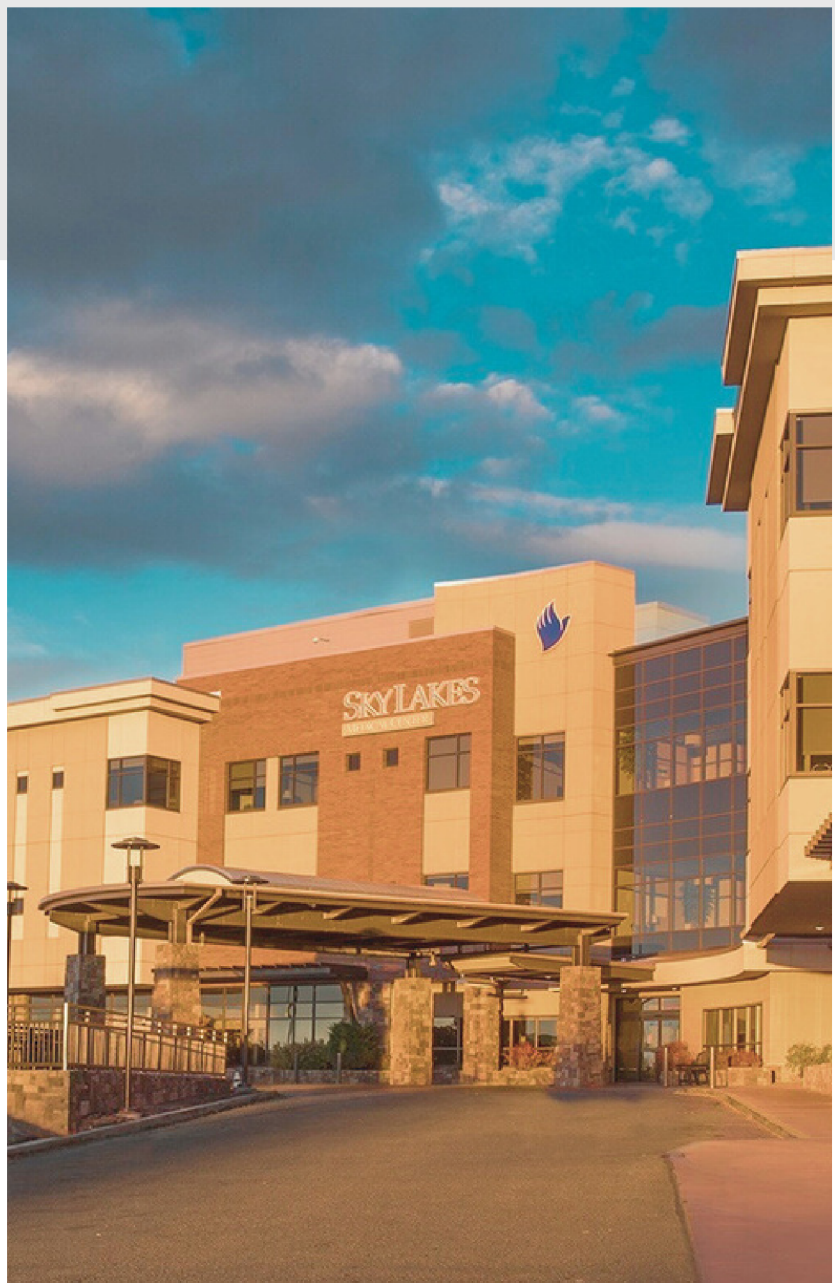


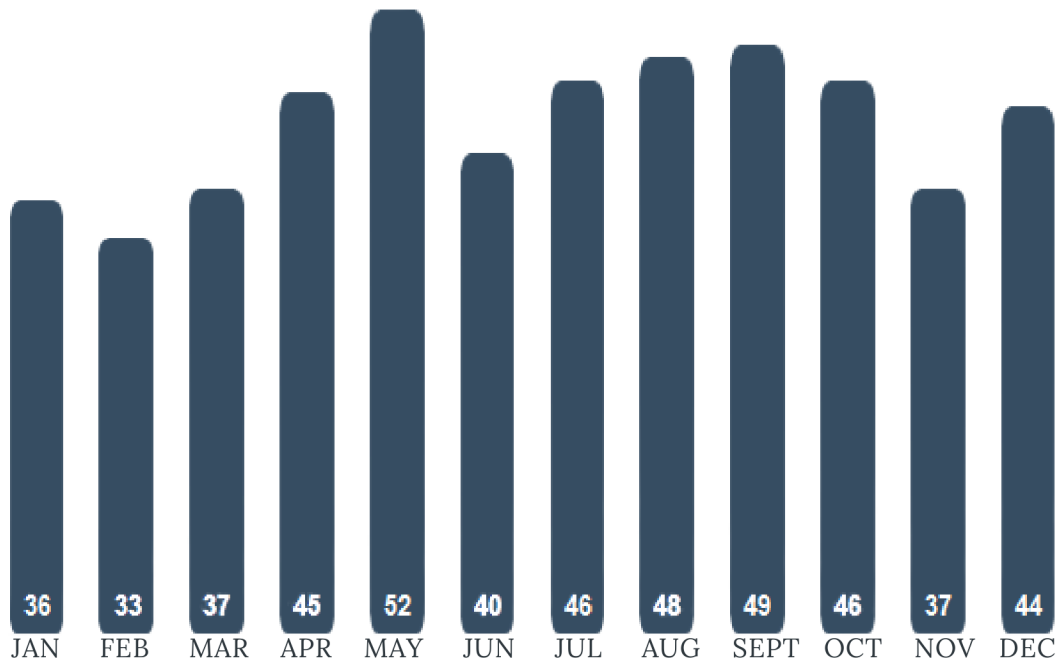


TABLE OF CONTENTS

• TRAUMA PROGRAM OVERVIEW	1
• WELCOME DR. OGAO	2
• QUICK STATS OF TRAUMA	3
• COMMUNITY PARTNER: KASEY LANNING KCC	4
• EMS ON THE SCENE	5
• COMMUNITY PARTNER: BRENT KNUDSEN KCFD #1	6
• ACTIVATION AND ARRIVAL	7
• MECHANISM OF INJURY	8
• INJURIES IN TRAUMA	9
• TRAUMA TRACK RESIDENTS	10
• LOS & DISPOSITION	11
• TIME TO OR FOR HIP FRACTURES	12
• TIME TO ANTIBIOTICS FOR OPEN FRACTURES	12
• BRAIN INJURY GUIDELINES	13
• TRAUMA TEAM MEMBER HIGHLIGHT: ED PHYSICIANS	14
• FINAL THOUGHTS	15

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TRAUMA PROGRAM OVERVIEW AT SKY LAKES



TRAUMA BY MONTH

513 total trauma patients in 2022

OUR SKY LAKES PROMISE

At Sky Lakes, we are committed to serving our community.

We promise to treat you with kindness, respect, and integrity as we dedicate ourselves to providing excellent care and positively impacting the wellbeing of our community.

LEVEL III TRAUMA CENTER

Sky Lakes Medical Center serves a nearly 10,000 square-mile section of rural southern Oregon and northern California. Sky Lakes Trauma team provided trauma service to over 500 trauma patients in 2022 alone. Working alongside nine ground ambulance agencies and two air ambulance companies, Sky Lakes Trauma program plays a central role as part of an educated, talented and organized network.

Sky Lakes Emergency staff maintain multiple levels of certifications which demonstrates the strength of the trauma team

- Basic Life Support (BLS)
- Advanced Cardiovascular Life Support (ACLS)
- Pediatric Advanced Life Support (PALS)
- Trauma Nursing Core Course (TNCC)
- Trauma Certified Registered Nurse (TCRN)
- Certified Emergency Nurse (CEN)
- Sexual Assault Nurse Examiner (SANE)

WELCOME

TRAUMA MEDICAL DIRECTOR

DR. JARED OGAO MD, FACS

DR. OGAO ACCEPTED THE POSITION OF TRAUMA MEDICAL DIRECTOR STEPPING INTO A ROLE THAT DEMONSTRATES HIS DEDICATION, EXPERIENCE, & LEADERSHIP IN TRAUMA CARE AT SKY LAKES

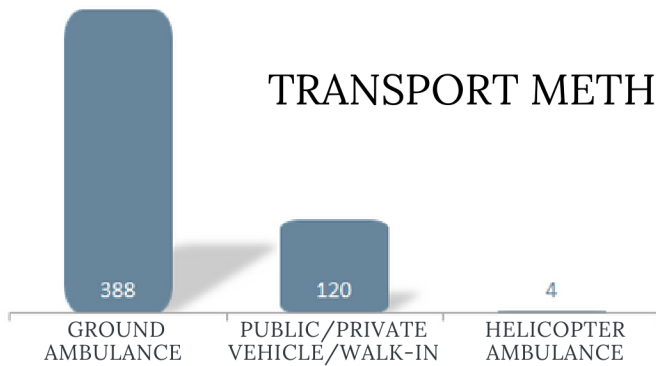
After earning his Bachelor of Science degree, majoring in biology with a minor in chemistry from the University of Utah in Salt Lake City, Dr. Jared Ogao went on to The Medical College of Wisconsin where he obtained his medical degree. From there he moved west for general surgery residency in Phoenix, Arizona. Dr. Ogao completed his surgical training in 2013 and became board-certified in 2014. He went on to become a Fellow of the American College of Surgeons in 2016. He is a skilled and experienced surgeon, and equally as impressive is his obvious compassionate care for his patients. Originally from Hawaii, Dr. Ogao has adapted to the not so balmy climate of Klamath Falls and has even taken up multiple outdoor snow sports. But his most prized "hobby" is spending time with his wife and their four children. Dr. Ogao and his family have embraced Southern Oregon and plan to call Klamath Falls home for years to come.



”
A skilled and experienced
surgeon, and equally as
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compassionate care for his
patients

QUICK STATS OF TRAUMA

TRANSPORT METHOD

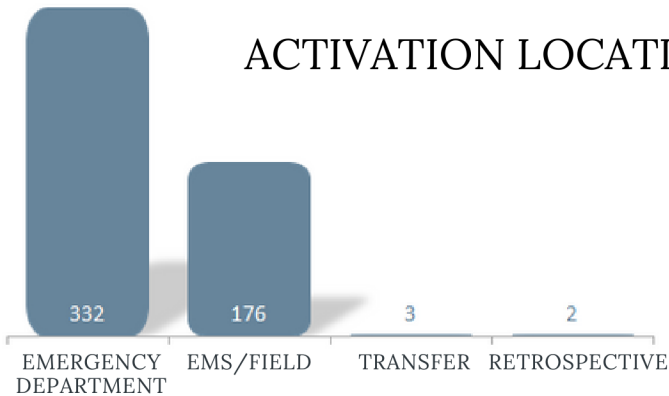


75%

TRAUMAS
TRANSPORTED BY
EMS

2022 trauma was primarily transported to Sky Lakes by our local EMS agencies. Private transport traumas became activated according to Oregon Trauma Criteria. Traumas transported by EMS were also activated upon ED arrival; in total 64% of traumas met trauma activation needs when recognized by ED staff. Only 10% of traumas required a trauma surgeon to be called and to be at the patient's bedside within 30 minutes of patient arrival.

ACTIVATION LOCATION

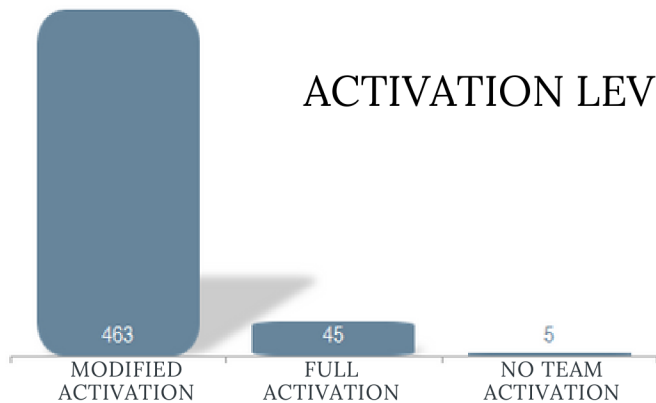


64%

TRAUMAS ACTIVATED
BY ED STAFF

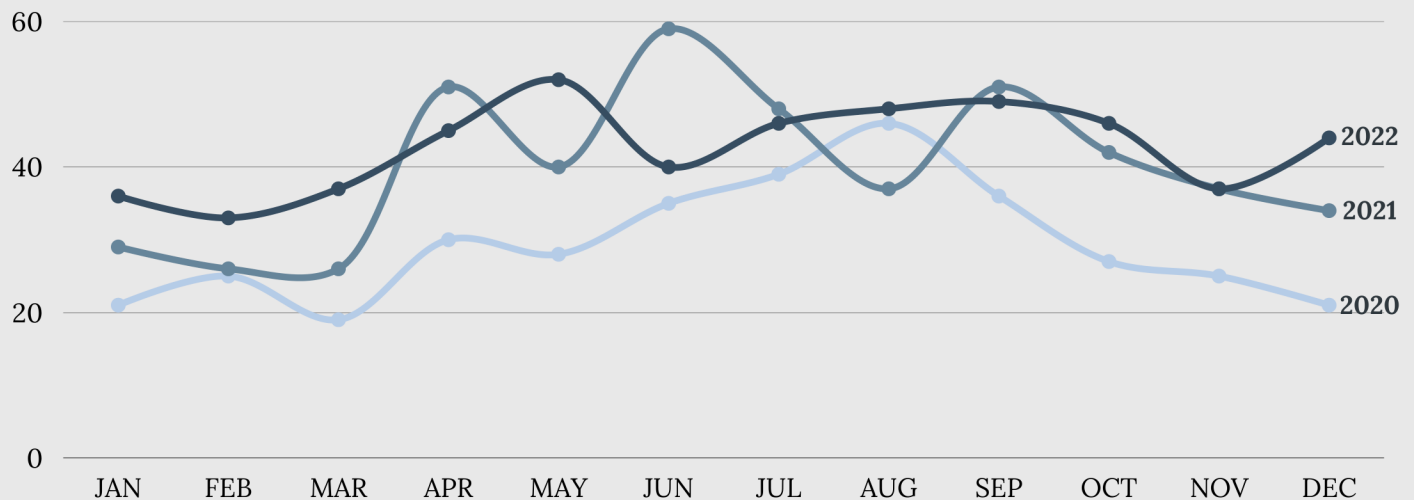
Looking back at trauma activations in the years prior to 2022, there was an increase in overall patients who met trauma criteria. 2020 brought 352 traumas to Sky Lakes. 2021 brought 480 patients in the trauma setting. 2022 ended with 513 trauma patients having been cared for by the trauma teams in the Emergency Department.

ACTIVATION LEVEL



10%

TRAUMAS ACTIVATED
REQUIRED A FULL
TEAM INCLUDING
SURGEON AT BEDSIDE



HISTORIC TRAUMA ACTIVATIONS BY YEAR

COMMUNITY PARTNERS TRAUMA CARE EXPERTISE AROUND THE BASIN



KASEY LANNING

KLAMATH COMMUNITY COLLEGE EMS ADVISORY COMMITTEE

As the Emergency Medical Service (EMS) program lead of Klamath Community College, I have received amazing support from Sky Lakes Medical Center. At the college, we provide initial and continuing education training to the EMS community in Klamath County. With the initial training, we are teaching new Emergency Medical Technicians (EMTs) to work in the prehospital field. Whereas the continuing education training is to provide individuals who are already in the field the most updated and current standards of practice of the EMS community. Sky Lakes Medical Center has played a critical role in these students not only meeting the state and national requirements, they have also helped these students receive a well-rounded education by participating in the Klamath Community College EMS Advisory Committee.

Advisory Committees enable the department chair and the community to work together to improve the curriculum and programs of the community college. They assist in coordinating the curricula of course offerings in individual disciplines, or in a group of related disciplines on a college-wide basis.

The Committee structure is meant to be broad-based; concerned with internal academic/curricular issues and also with such issues as high school/college articulation, community college/baccalaureate college articulation, review of grant application and student petitions when requested. Community input and participation in discussion of course and program analysis is a key role of Advisory Committees.

Advisory committees are expected to provide input and recommendations to ensure that Klamath Community College's courses and programs are meeting real world demands of business, industry, labor and the profession while responding to the community needs.

Along with playing a critical role in our advisory committee, Sky Lakes Medical Center has also played a critical part within the class instruction itself. They have provided training such as "Stop the Bleed", MCI training/triage, donated equipment, and instructed many other classes whether it be for initial or continuing education purposes.

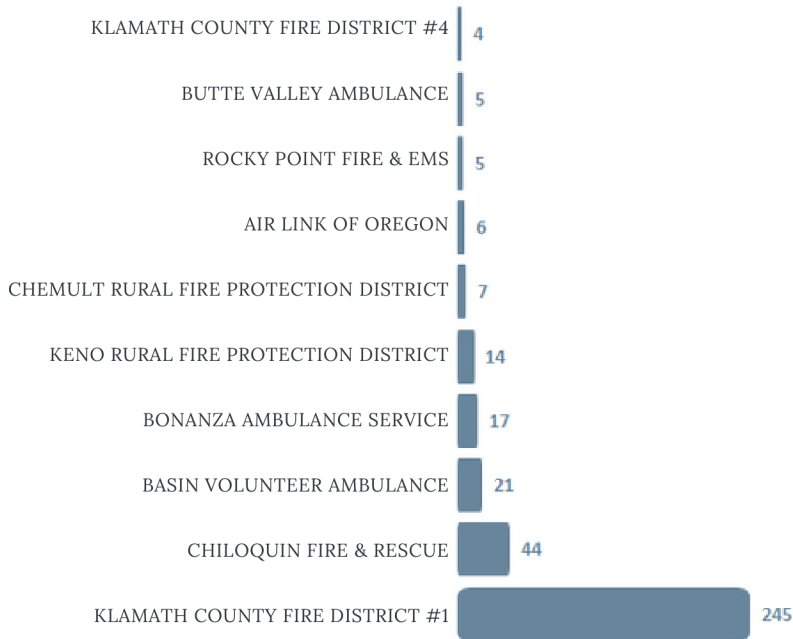
I look forward to our continued relationship as the program continues to grow and thrive under the support of our local hospital.

Sincerely,

Kasey Lanning
EMS Program Lead

EMERGENCY MEDICAL SERVICES ON THE SCENE

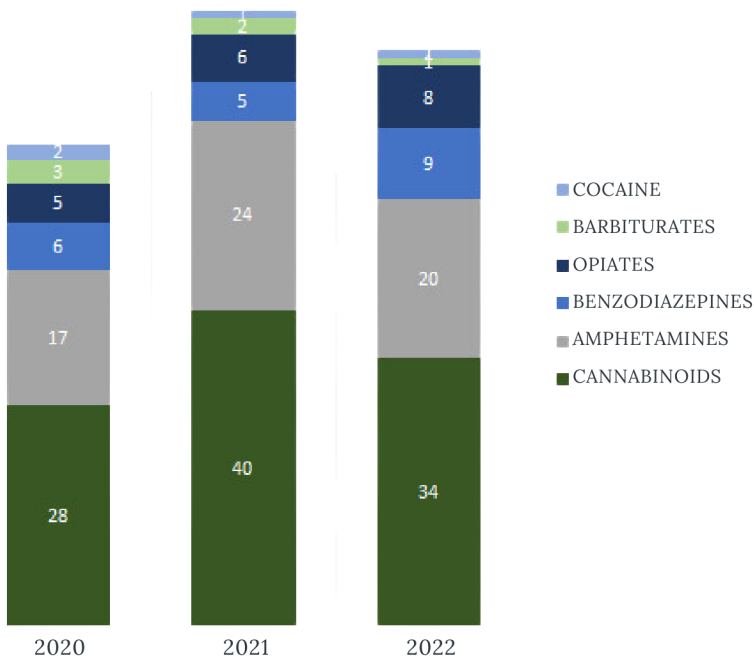
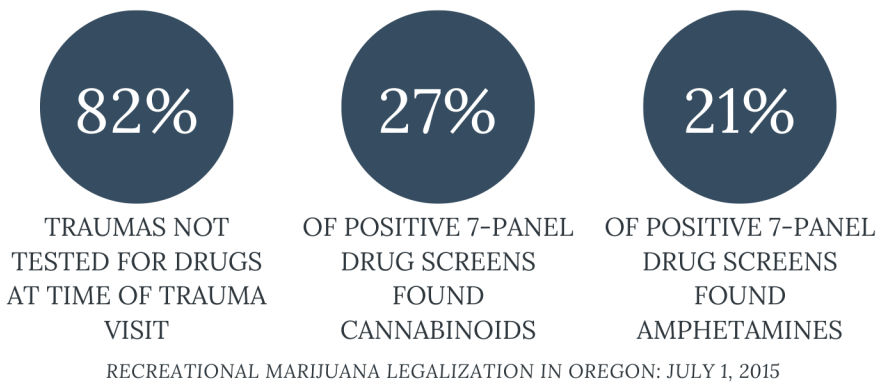
TRANSPORTING AGENCY



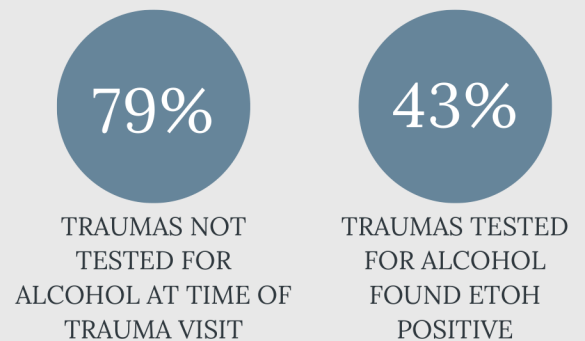
As the only receiving facility for nine ground ambulance agencies and two air ambulance companies Sky Lakes Trauma Program cared for a combined 513 patients in 2022. 368 of these patients were transported by EMS agencies - in total 71% of all trauma. These agencies are a vital piece of trauma care in Klamath County. The relationship that the Sky Lakes care team maintains with each EMS crew member speaks to the strength our organizations have together. Many ambulance crew members are volunteers. These amazing personalities provide quality Basic and Advanced life support to community members in their time of need.

Another unique aspect of trauma is the factor of intoxicants present at time of accident or injury. Below is a breakdown of both alcohol and drugs found upon testing in the ED during a trauma activation.

DRUG POSITIVE TRAUMA



ALCOHOL POSITIVE TRAUMA



COMMUNITY PARTNERS

TRAUMA CARE EXPERTISE AROUND THE BASIN

BRENT KNUDSEN

KLAMATH COUNTY FIRE DISTRICT #1

OVERVIEW

Klamath County Fire District 1 (KCFD1) provides Advance Life Support ambulance response and pre-hospital care within a 492 square mile Ambulance Service Area. Emergency Medical Service (EMS) response accounts for the bulk of work done by our responders. In 2022, 6,943 of KCFD1's 8,852 calls for service were EMS related.

All uniformed KCFD1 personnel are licensed EMTs or Paramedics. KCFD1 has 38 Paramedics, 2 EMT-Intermediates and 23 EMT-Basics that operate out of four stations. KCFD1 staffs three Advanced Life Support ambulances responding from Station 1, Station 3, and Station 4. KCFD1 has three different shifts that provides EMS service seven days a week 24 hours a day. Each shift has four personnel who solely work on the ambulance. Each KCFD1 ambulance has at least one Paramedic.

TRAINING

EMS Standing Orders are a guideline for patient care that is approved by KCFD1's Medical Director and Sky Lake's Emergency Room Physician, Dr. Jakob Freid. In early 2022, KCFD1 personnel started working with Dr. Freid on rewriting EMS Standing Orders to ensure KCFD1 uses the latest science, medications and treatments available when KCFD1 citizens need it most. These new Standing Orders were implemented in November of 2022. Some of the highlights of these new Standing Orders in regard to Trauma related EMS incidents are:

- Hemostatic Dressing
- Protocol for Pelvic Sling
- Protocol for Tourniquet
- Tranexamic Acid (TXA) added

As the demand for service on our EMS operations continues to increase, it is crucial that all members engage in EMS training. EMS training at KCFD1 is quarter based with a developed schedule designed to help us prepare for the upcoming season. For example, training on Trauma Emergencies will occur before summer, when our service demand increases for these call types.

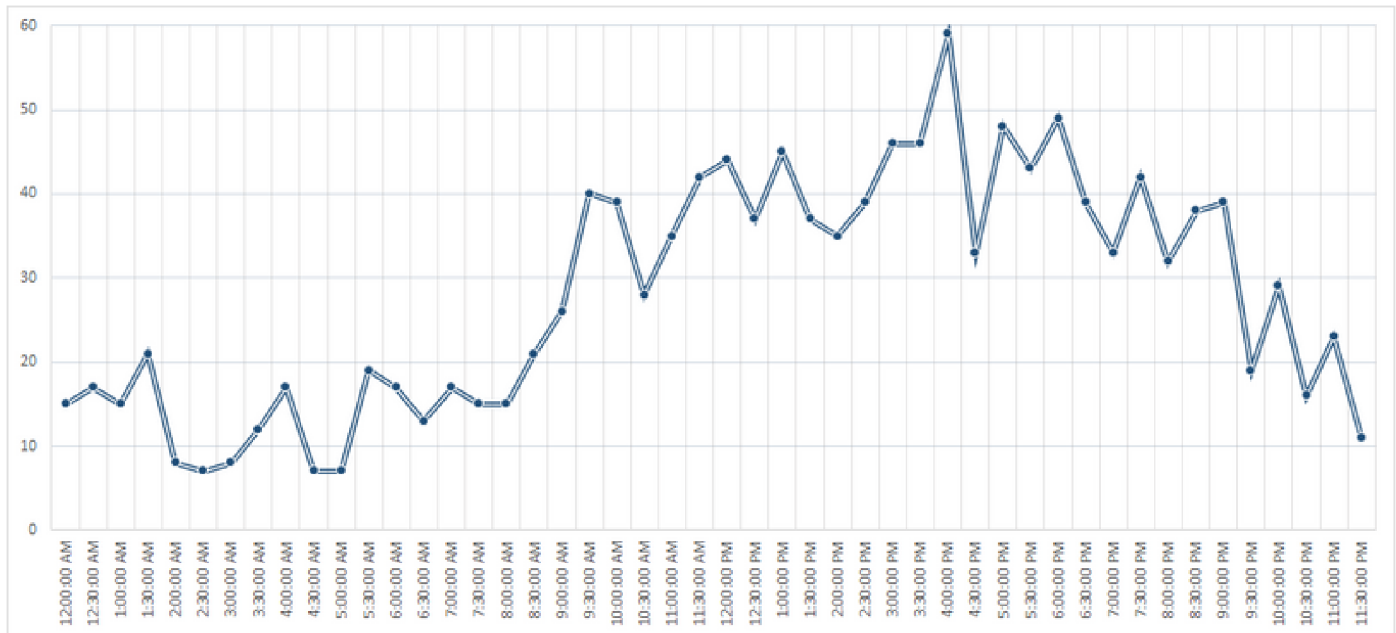
KCFD1 was fortunate enough to recently secure funding for new EMS training equipment from the KMSB foundation. This training equipment will enhance our EMS training in all aspects and particularly with our trauma related training.

RELATIONSHIP WITH SKY LAKES TRAUMA PROGRAM

KCFD1 has a long-standing relationship with the Sky Lakes Trauma Program. In May 2022, KCFD1 and other agencies worked with Sky Lakes Trauma Program on MCI Triage Training. KCFD1 ambulance crews would put on triage tags on patients that were transported to Sky Lakes Emergency Room. This was a great training put on by the Sky Lakes Trauma Program because it gave our crews a great opportunity to use the triage tag system. The Sky Lakes Trauma Program also provides feedback on patients who were transported to Sky Lakes with trauma related injuries and/or complaints. This allows KCFD1 crews to find out the patient's outcome and also gives crews feedback on their patient care. This is a fantastic training opportunity for our personnel. KCFD1 personnel has gained a lot from this program.



TIME OF TRAUMA ARRIVAL: THREE YEARS OF DATA, 2020-2022

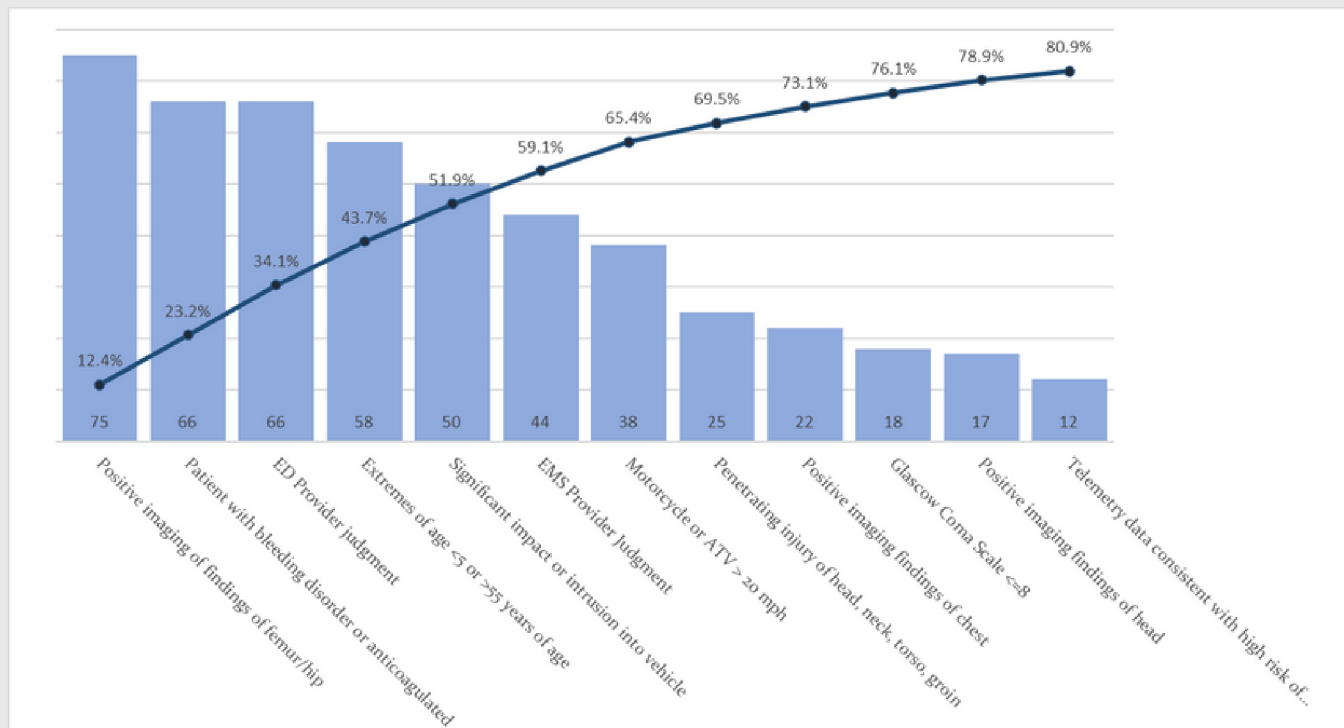


By combining the past three years of arrival times for trauma activations received at Sky Lakes, we can see the peak time of trauma arrivals has been 4:00pm.

Below, twelve trauma activation criteria account for 80% of all trauma activations. Trauma patients may have met multiple activation criteria in the field or upon arrival. Penetrating injuries and Glasgow Coma Scale below 8 were the only two full activation criteria to be counted in the top 80%.

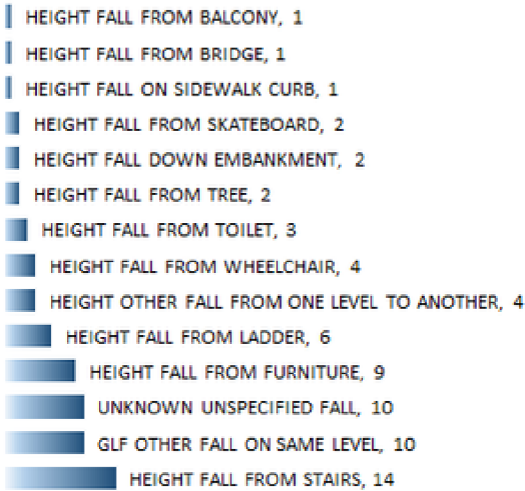
TOP ACTIVATION CRITERIA 2022

80% OF TRAUMAS WERE ACTIVATED BY MEETING ONE OR MORE OF THESE 12 CRITERIA



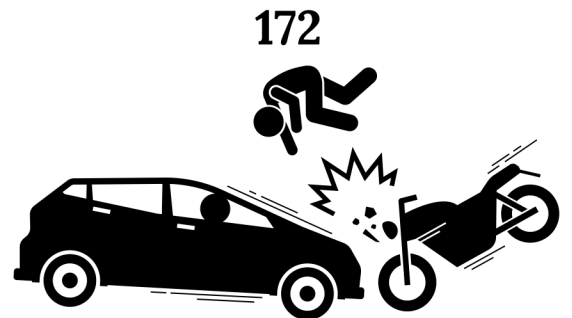
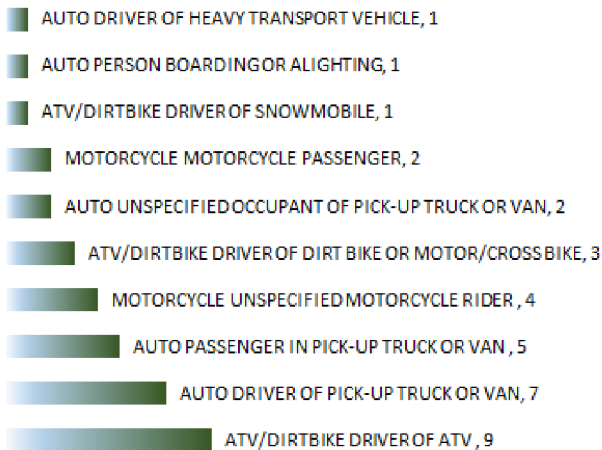
MECHANISM OF INJURY

LARGEST MOI CATEGORY



GLF FALL ON SAME LEVEL, 163

2ND LARGEST MOI CATEGORY



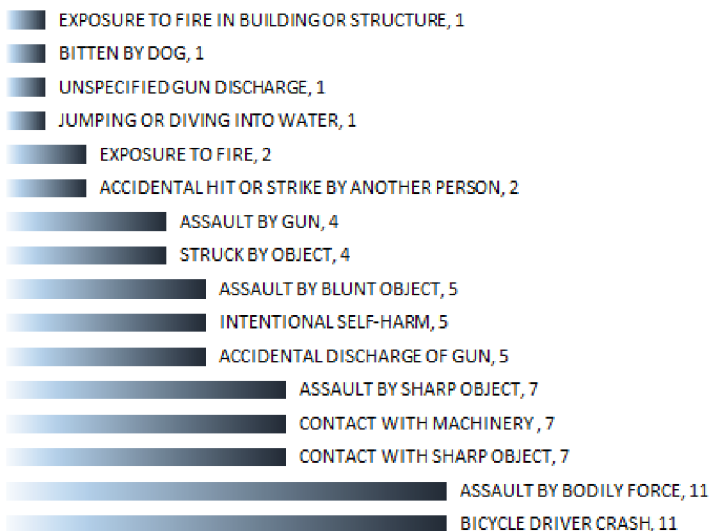
AUTO UNSPECIFIED CAR OCCUPANT, 21

MOTORCYCLE MOTORCYCLE DRIVER, 23

AUTO CAR PASSENGER, 37

AUTO CAR DRIVER, 56

3RD LARGEST MOI CATEGORY

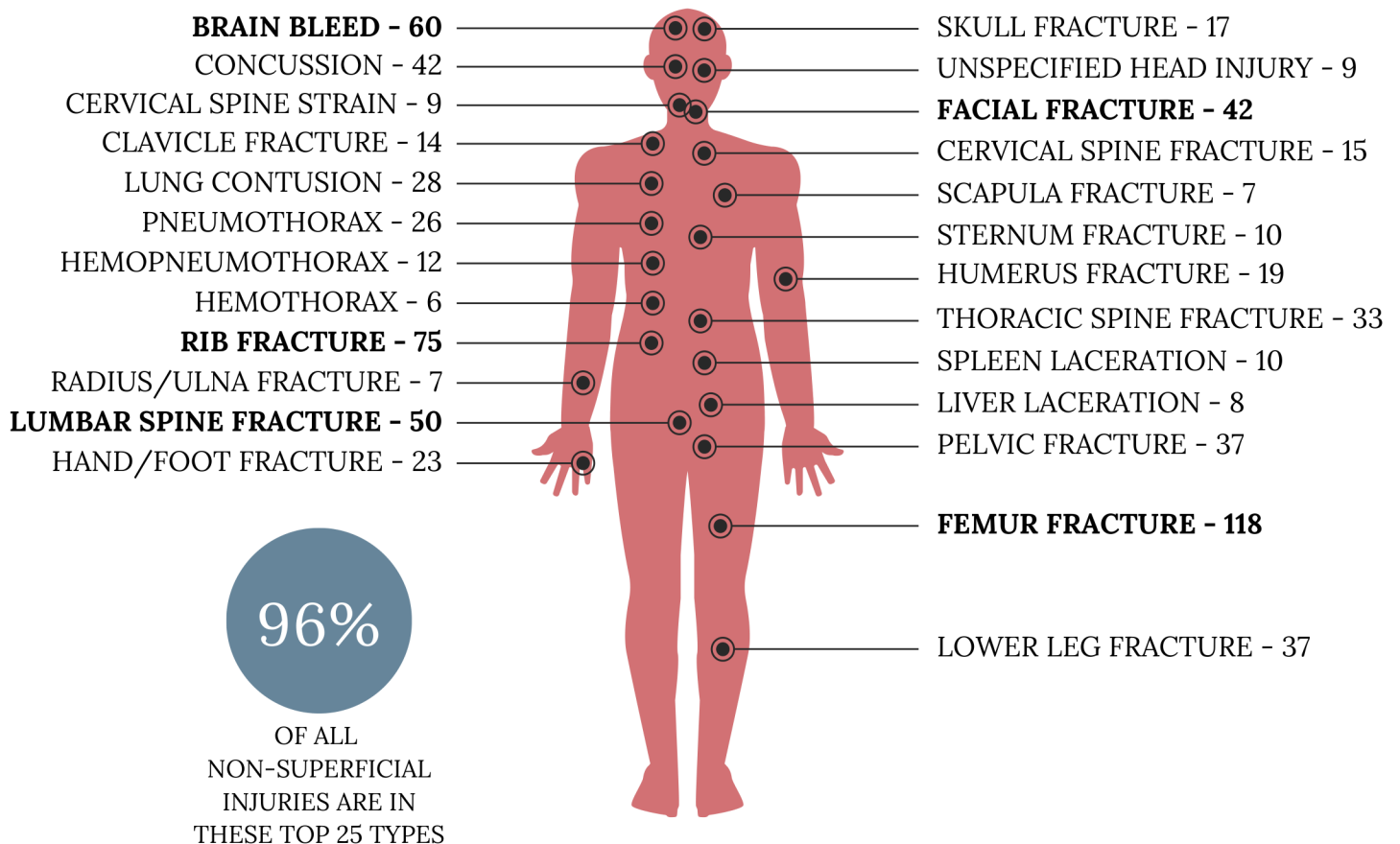


PEDESTRIAN STRUCK BY CAR, 15

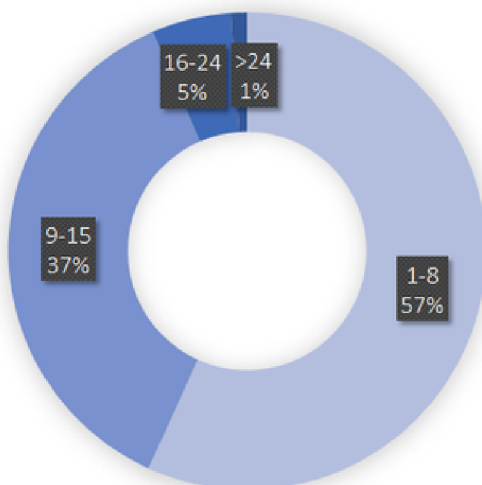
RIDER THROWN STRUCK BY ANIMAL, 20

Injuries are graded using ICD-10 coding (ISS) and Adjusted Injury Scaling (AIS) which is specific to trauma settings. In 2022 for all 513 traumas the average ISS score 6.7 and the average AIS score was 7.4. Any injury score 16 and over is considered severe. A injury score of 75 is considered non-survivable. The highest ISS score of the 513 traumas in 2022 was 36. The highest AIS score was 50. The top injury of 2022 was femur fractures with 118 total. The injury severity score for a femur fracture is 9.

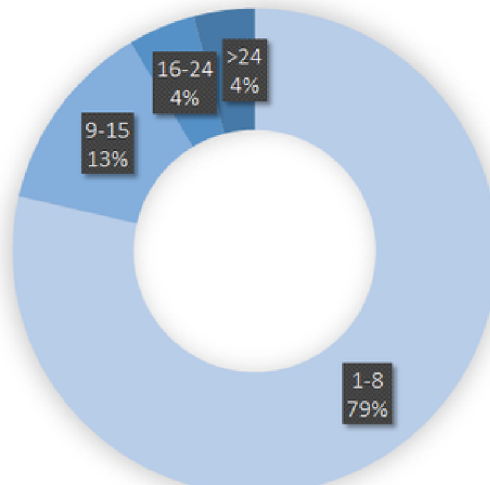
TOP 25 NON-SUPERFICIAL INJURIES AND THEIR TOTALS



INJURY SCORE BREAKDOWNS



INJURY SEVERITY SCORE (ISS)

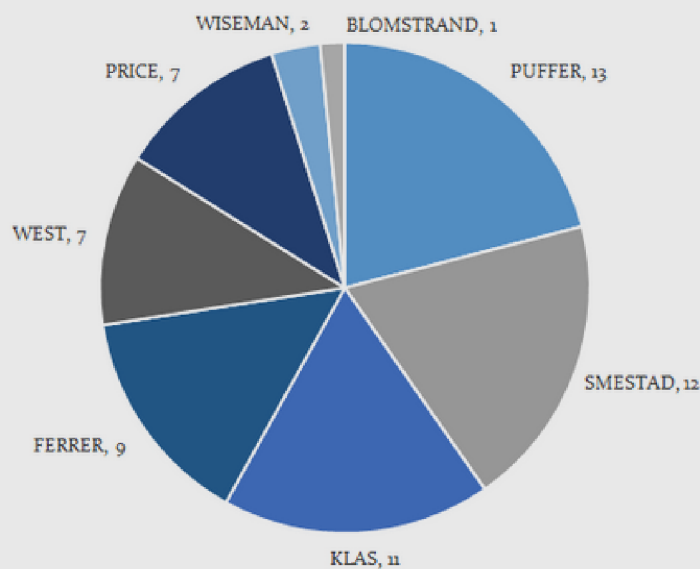


ABBREVIATED INJURY SCALE (AIS)

RESIDENTS ON TRAUMA TRACK

Since 2020 Family Practice Residents training at Sky Lakes and Cascades East Family Practice have had the opportunity to join the Trauma Resident Track. This experience gives them unique, hands-on experience in trauma specific training. The Trauma Resident Track is intended for those residents who intend to hold careers in rural settings where access to trauma centers might be limited. Trauma Residents are championed by the Trauma Medical Director and ED Physicians. For consideration in the Trauma Resident Track second and third year residents must be Advanced Trauma Life Support (ATLS) certified, use two elective slots to complete one month of ED time, and it is recommended that they attend quarterly Trauma Committee meetings for an additional 1.5 CME.

RESIDENTS AT BEDSIDE



AVERAGE MINUTES
PROVIDER RESPONSE
TO BEDSIDE



TRAUMAS ATTENDED
BY TRAUMA TRACK
RESIDENTS

Trauma Track Residents are called to the ED bedside upon trauma activation. With guidance of the on-call Trauma Surgeon and ED Physician attending Residents are given the chance to perform life-saving, time-sensitive procedures.

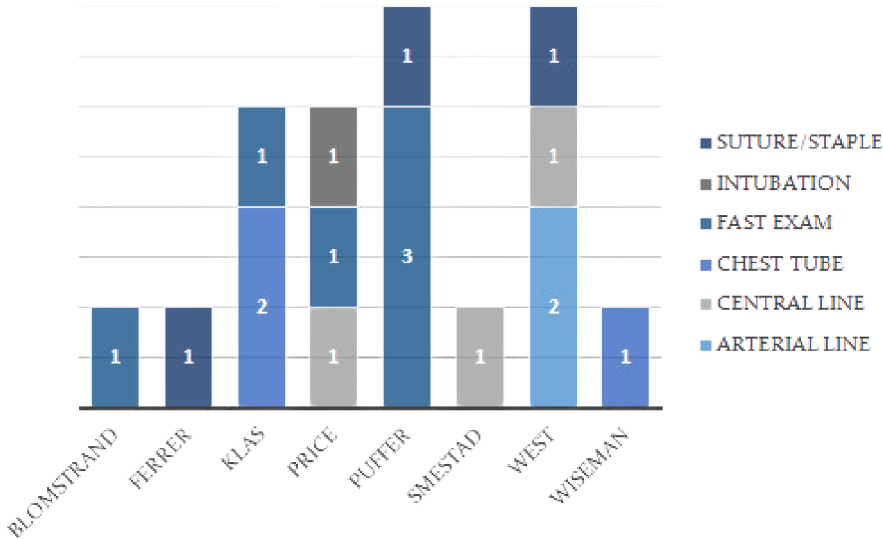
PROCEDURES PERFORMED



TRAUMA TRACK
RESIDENTS

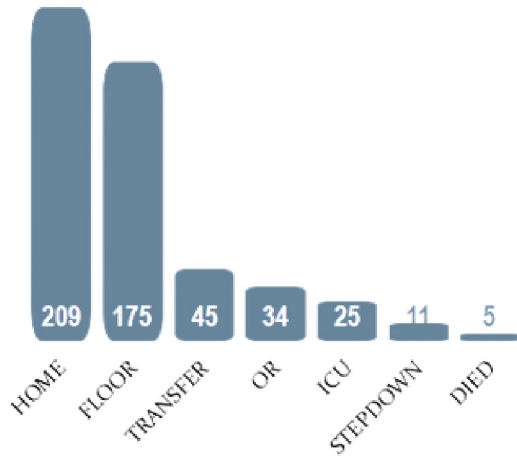


PROCEDURES
PERFORMED



EMERGENCY DEPARTMENT LENGTH OF STAY AND DISPOSITION

ED DISPOSITION



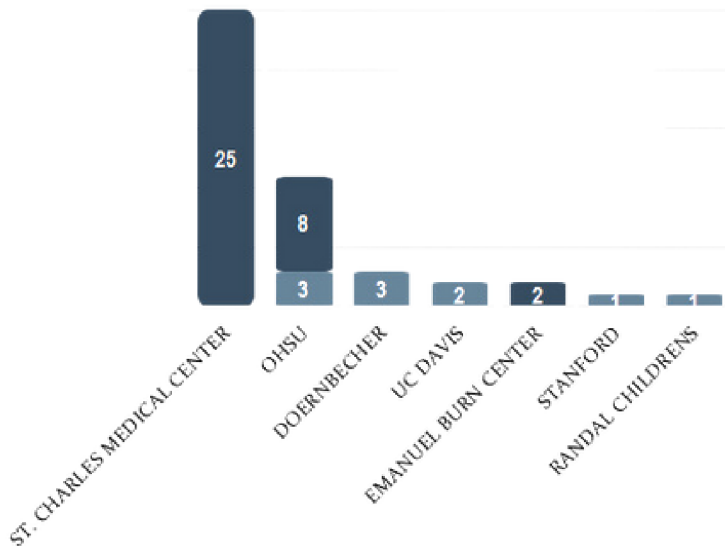
49%

OF TRAUMAS WERE
ADMITTED
TO SKY LAKES

Nine patients omitted from ED disposition graph were discharged as follows: five direct admissions without ED disposition, two patients discharged to law enforcement, one left against medical advice, one discharged to home after observation.

TRANSFER OUT DESTINATION

■ PEDIATRIC PATIENT ■ ADULT PATIENT

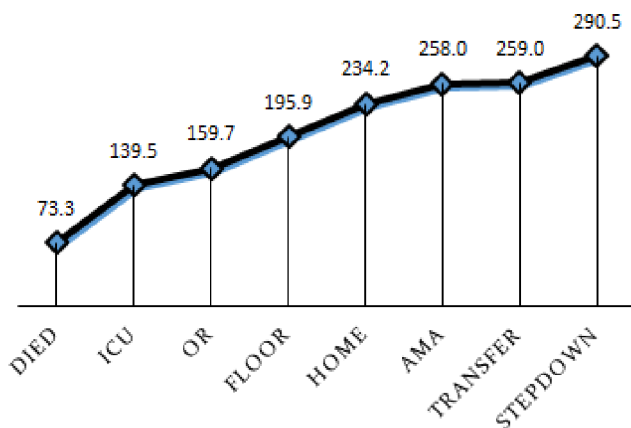


22%

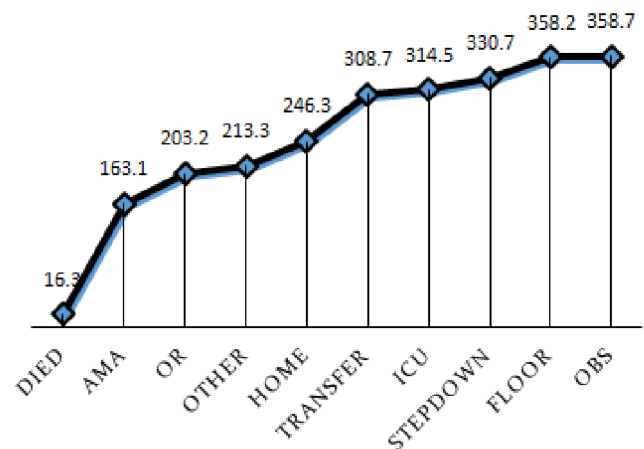
OF TRAUMAS
TRANSFERRED
WERE PEDIATRIC
PATIENTS

The majority of trauma patients are transported to St. Charles Medical Center of Bend - a level II trauma center with neurosurgical services. St. Charles and Sky Lakes belong to the same Area Trauma Advisory Board and is the preferred transfer pattern for patients requiring higher level of care. Pediatric patients however are transferred to pediatric specific trauma centers.

FULL TRAUMA ED LOS



MODIFIED TRAUMA ED LOS



TIME TO SURGICAL REPAIR

HIP FRACTURES IN PATIENTS AGED 65 AND OLDER

53

PATIENTS QUALIFY FOR
INCLUSION IN THIS SET

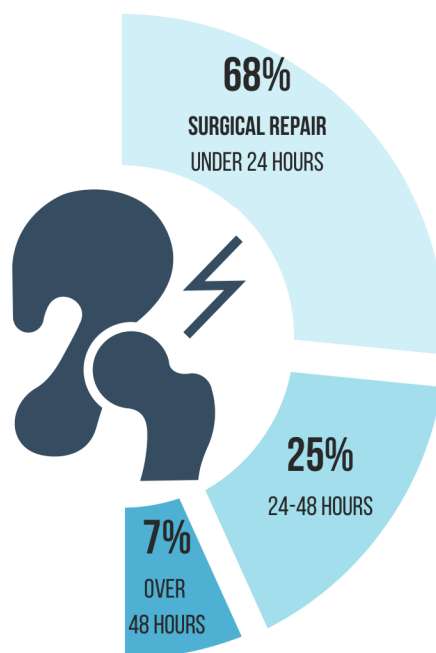
80.5

AVERAGE AGE OF THIS
PATIENT SET

Along with an aging population the occurrence of hip fractures is rapidly increasing as well. Hip fractures present an ever more concerning health issue worldwide due to an associated high mortality rate. As evidence is gathered the outcomes of delayed surgery have been discussed broadly. One standard of care that has emerged is a guideline aimed as rapid surgical repair for hip fractures among the elderly. More favorable outcomes can be associated with surgical repair performed within 24 hours of hospital admission.

According to the NCBI, when performed within 24 hours of admission patients have experienced not only reduction of mortality, but also decreased hospital length of stay, fewer postoperative complications, and increased quality of life following discharge.

Here we present baseline data according to the 24 hours to surgery for elderly hip fractures guideline.

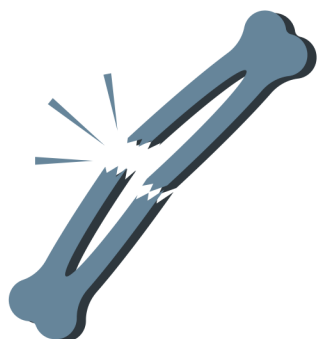


TIME TO ANTIBIOTICS

FOR OPEN LONG BONE FRACTURES

44%

OF OPEN LONG BONE
FRACTURES RECEIVED
ANTIBIOTICS IN UNDER 60
MINUTES FROM ARRIVAL



Intravenous antibiotics have been shown to significantly reduce the incidence of infection when given early following injury. While many factors affect the occurrence and severity of infection, antibiotics administered quickly can drastically reduce the chances of infection. When soft tissue is contaminated to any level, bacteria can penetrate the site and adhere to tissue, bone, or fixation devices causing a list of complications for the already injured patient.

Given the large socioeconomic burden associated with wound infections following initial trauma, the use of antibiotics in clinical settings is highly recommended. In our efforts to reduce the risks of fracture-related infections here we present baseline data for time to antibiotics for open fractures.

9

CASES WITH OPEN
LONG BONE
FRACTURES

57

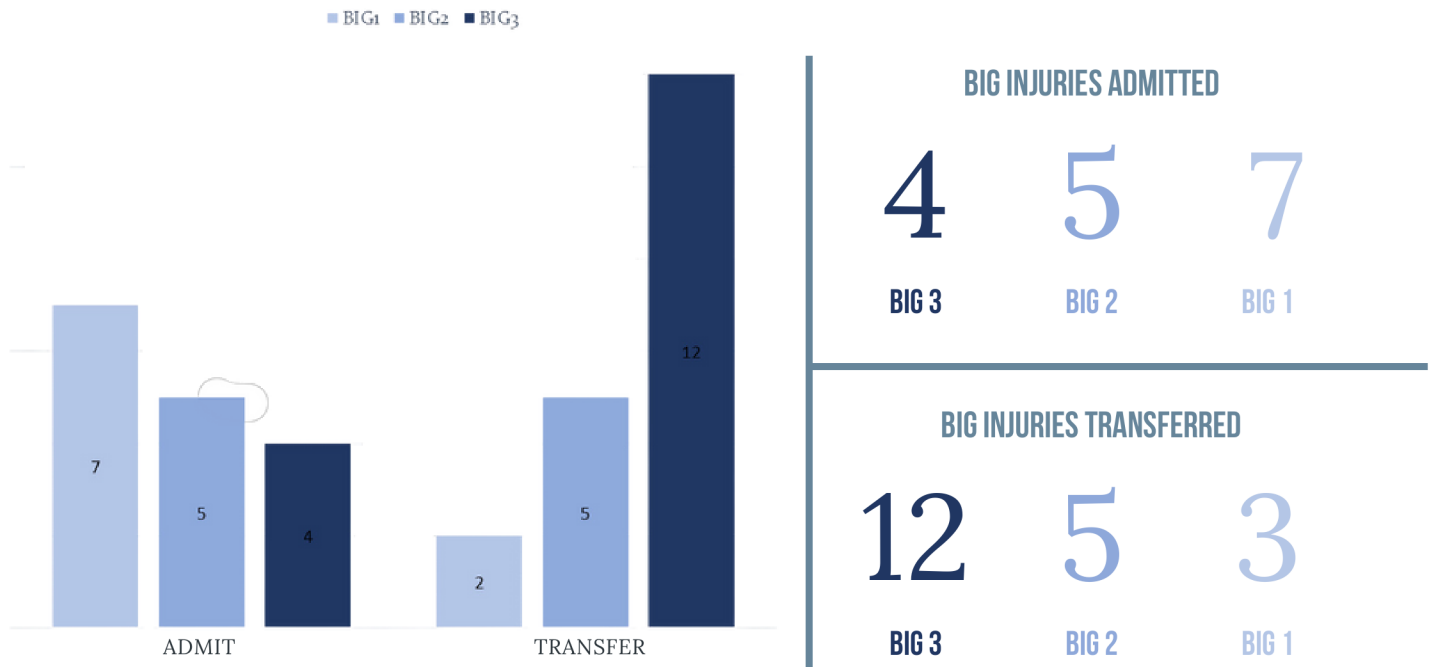
AVERAGE MINUTES
FROM PATIENT ARRIVAL
TO FIRST ANTIBIOTIC

BRAIN INJURY GUIDELINE CRITERIA

ADMISSIONS VS. TRANSFERS

The BIG criteria table to the right is a tool used to categorize the efficiency of care provided to patients experiencing traumatic brain injury (TBI). This method of review allows Trauma Program Managers to monitor those patients who truly require admission or transfer, additional radiographic studies, or specialist consultation for appropriate scenarios.

Variables	BIG 1	BIG 2	BIG 3
Anticoagulation	No	No	Yes
Skull Fracture	No	Non-displaced	Displaced
Subdural Hemorrhage	≤ 4 mm	5-7 mm	≥ 8 mm
Epidural Hemorrhage	≤ 4 mm	5-7 mm	≥ 8 mm
Intraparenchymal Hemorrhage	≤ 4 mm	5-7 mm; 2 locations	≥ 8 mm; Multiple locations
Subarachnoid Hemorrhage	Trace	Localized	Scattered
Intraventricular Hemorrhage	No	No	Yes



In an effort to stay ahead of trends, Sky Lakes Trauma Services members attend multiple Oregon Health Authority organized meetings. It is in these meetings where discussions on topics such as BIG head criteria first arise. These meetings are most often held on a quarterly basis, but at times ad hoc cohorts are formed on specific topics. One such session was held by the Rules Advisory Committee regarding field triage guidelines. As a member of all state affiliated groups, the Trauma Program represents Sky Lakes with the best interests of our organization and the community in mind.

100%

ATTENDANCE BY SKY LAKES TRAUMA SERVICES

- STATE TRAUMA ADVISORY BOARD
- TRAUMA DATA WORKGROUP
- AREA TRAUMA ADVISORY BOARD
- TRAUMA PROGRAM MANAGERS MEETING
- RULES ADVISORY COMMITTEE ON FIELD TRIAGE GUIDELINES

EMERGENCY DEPARTMENT PHYSICIANS

TRAUMA TEAM MEMBER HIGHLIGHT



DR. BRUNSWICK



DR. LEPARD



DR. FREID



DR. SPALDING



DR. UDINK



DR. WILLIAMS



DR. FOWLER



DR. MCCREADIE



DR. BRUTTIG



DR. NESS



DR. PETERSON

A critical component of trauma care at Sky Lakes is our Emergency Department Physician team. With 109 combined years of service in the Sky Lakes ED this team of Physicians exemplifies the knowledge, expertise, and devotion that makes our organization so strong.

Dr. Lepard & Dr. Brunswick have been serving Sky Lakes for 22 and 27 years respectively. Dr. Freid & Dr. Spalding have been with Sky Lakes for 14 years each. Thank you to all of these amazing Doctors for their service to Sky Lakes.

In 2022 this team cared for over 500 trauma patients with outstanding response times. Our ED physician team arrived on average 1.4 minutes before patient arrival for full team activations. For modified team activations -including those who arrived by private vehicle- the average door to doctor time was 11.5 minutes. And for those trauma patients activated based on injuries found on imaging our physician team arrived 26 minutes from patient arrival.

Dr. McCreadie as the ED Medical Director has shown leadership and devotion during his 6 years with Sky Lakes. Thank you for all that you do to navigate the ED through these changing times.

As trauma cases continue to rise, along with general patient census in congruity with the local population, this group of doctors continues to raise the bar on care provided to the Basin.

This team of Physicians exemplifies the knowledge, expertise, and devotion that makes our organization so strong

FINAL THOUGHTS

In conclusion, 2022 was a year of growth, opportunity, learning, and teamwork for the Sky Lakes Trauma Program. The staff and management responsible for ongoing success in trauma patient care proved to be stronger than ever. As the healthcare landscape and Sky Lakes as a whole continue to change, we anticipate ongoing success in trauma care provided to our community.

TRAUMA PROGRAM MANAGER

- Taught 11 Stop The Bleed classes to 109 students
- Hosted 15 MTP training classes to 43 students in ED, Flex Team & Resident Medical Team
- Coordinated EMS START Triage week
- Participated in MCI table top exercise alongside Kingsley Field

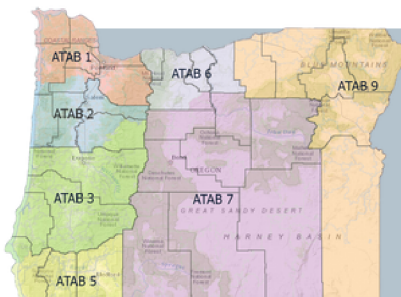


TRAUMA REGISTRAR

- Member of Oregon Trauma Data Workgroup
- Earned 10 CEU studying as a member of the American Trauma Society
- Assisted in surgeon credentialing with quarterly reporting
- Presented quarterly data at Trauma Committee

TRAUMA OFFICE NEW LOCATION

- In 2022 the Trauma Program Manager's (TPM) office moved to the second floor
- This move gives inpatient trauma care staff easier access to our TPM Stacey
- Stacey can now easily round on admitted trauma patients during their recovery



OREGON HEALTH AUTHORITY SURVEY YEAR: 2024

- Looking forward, Sky Lakes will welcome the Oregon Health Authority survey team back in 2024
- Trauma level designation is a performance based standing
- Thank you to all those who contribute to our successful surveys



We thank you for your ongoing support of our program

SPECIAL WORD OF THANKS TO

Our new President **David Cauble**, leading with commitment and vision for Sky Lakes and our community as a whole

Leadership in administration continuing to support Trauma Services including **Ronald Woita, Richard Rico, Grant Niskanen, Grant Kennon**

The new suite of administration leadership whom we welcome with excitement including **John Timmerman & Bryan Fix**

The **Directors & Management** of Sky Lakes who lead with kindness, respect, excellence, innovation, integrity and provide a sense of belonging to all

Our **front line staff** who dedicate themselves to providing excellent care for all patients

The **supporting staff** who positively impact the wellbeing of our community in countless ways behind the scenes

Sky Lakes Medical Center
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www.skylakes.org