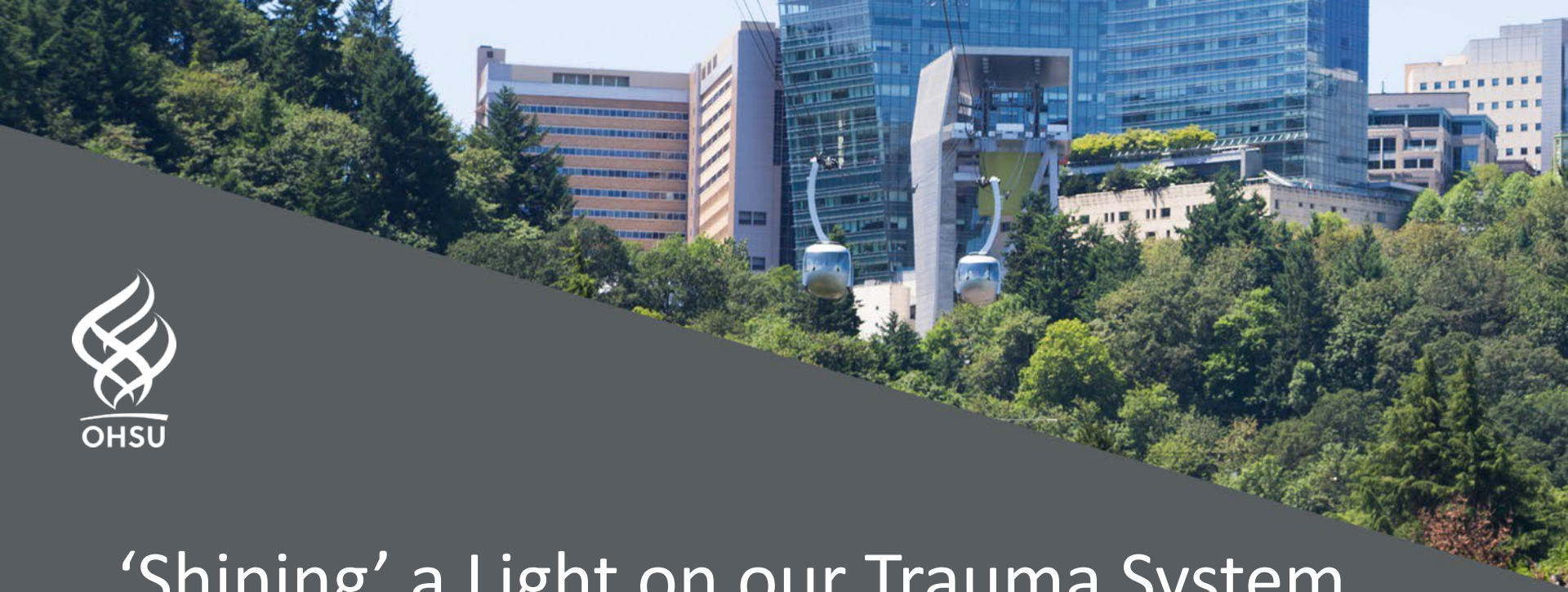

‘Shining’ a Light on our Trauma System

DATE: October 22, 2022 PRESENTED BY: Heather Wong, Trauma Program Director

Objectives

- Review key components of the Oregon Trauma System
- Discuss how our inclusive trauma system works to support patient care

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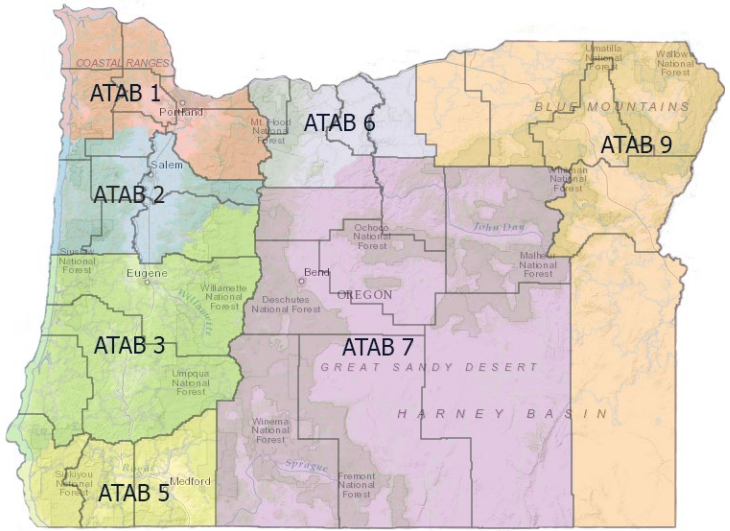
The Burden of Injury


LEGO
LEGO

History of the Oregon Trauma System

- Legislation signed in 1985 by then-Gov. Victor Atiyeh
- System implemented in 1988
  - Four tiers of trauma centers and Critical Access Hospitals
  - State trauma registry
  - State Trauma Advisory Board
  - Seven Area Trauma Advisory Boards



Elements of Care in Trauma

American College of Surgeons, 2022

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Golden Hour

- Trauma care is time dependent
- Emphasizes the urgency of care
- Reality is that sometimes it is the “Golden 24 Hours”

“There is no such thing as a ‘Golden Hour’ for a patient with severe blood loss,” (Mark Gestring, n.d.)

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Case Presentation

- 45 year old male who was struck in the chest with an axe blade

What do you want to know??

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First Care Providers

Bystander Care

- Is the scene safe?
  - Run, Hide, Fight
- Integral in activating EMS
- Most have little to no training
- Use equipment at hand
- Training that can help
  - Stop the Bleed
  - BLS
  - First Aid

Smith, Callaway, Bobko, & Shapiro; 2016

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911

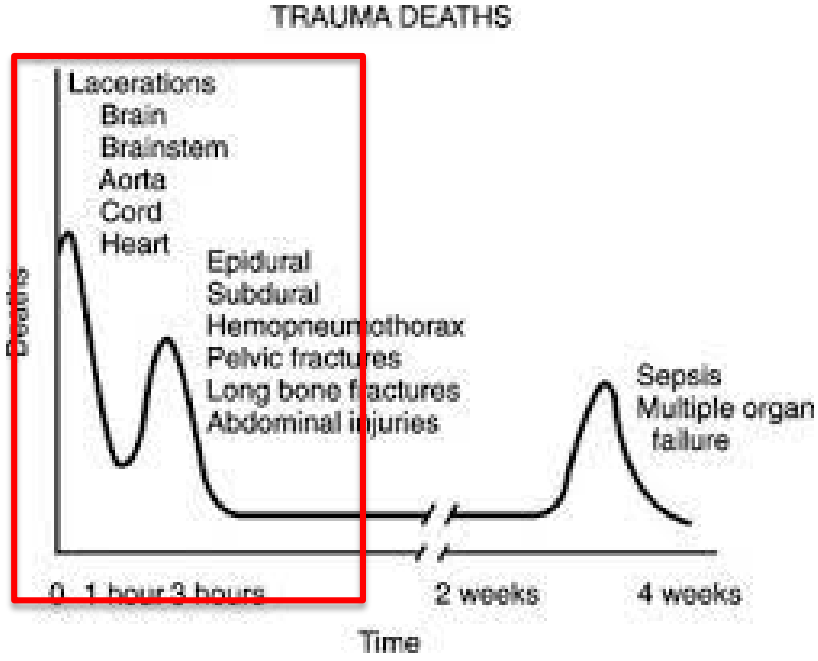
- State wide program
  - Basic 911 established in 1981
  - Enhanced service began in 2000
- Consistent number across North America
- Covers 36 counties within the state
- Information to give:
  - Location of the emergency
  - Street address and room/apartment number
  - The number you are calling from
  - Nature of the emergency
    - Number of people injured
    - Are they conscious/breathing
    - Is there bleeding

A Little bit about EMS in OR

Prehospital EMS Care

- 2 Tier Response – Fire and EMS Transport
- Transport – Ground, Rotor Wing, Fixed Wing
- National EMS Education Standards
  - EMT
  - Advanced EMT
  - Paramedic
- Field Triage Guidelines

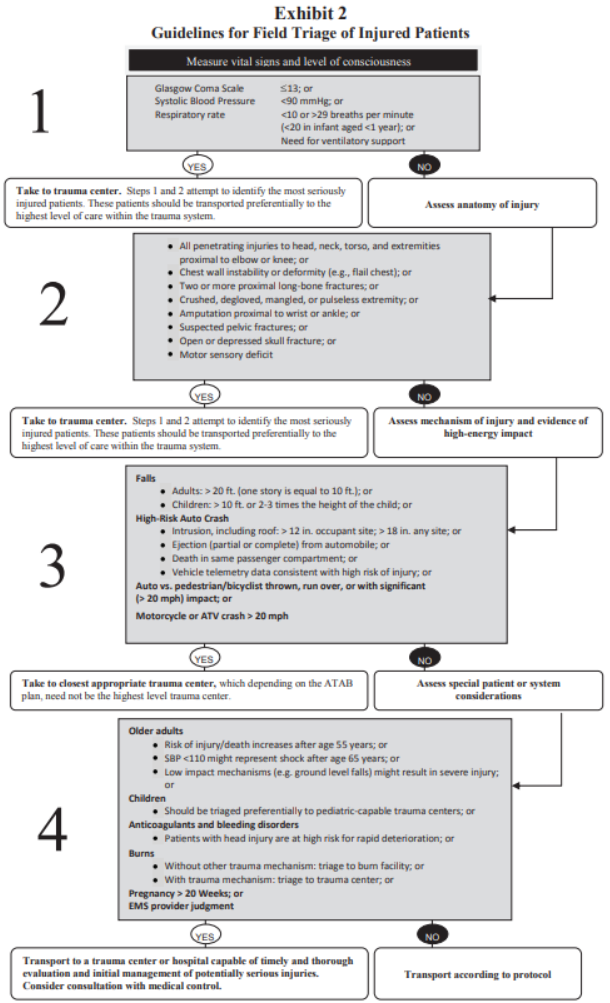
Shifting the Curve




“Flakes of snow swirled and danced across the porch. The Overlook faced it as it had for nearly three-quarters of a century, its darkened windows now bearded with snow, indifferent to the fact it was now cut off from the world” (Steven King, The Shining)

"Field Triage Guideline for Injured Patients assists EMS clinicians in identifying the patients at greatest risk of severe injury after a traumatic event and directing high-risk patients to the most appropriate trauma center available to care for them. Getting the right patient to the right place at the right time saves lives." Dr. Eileen Bulger

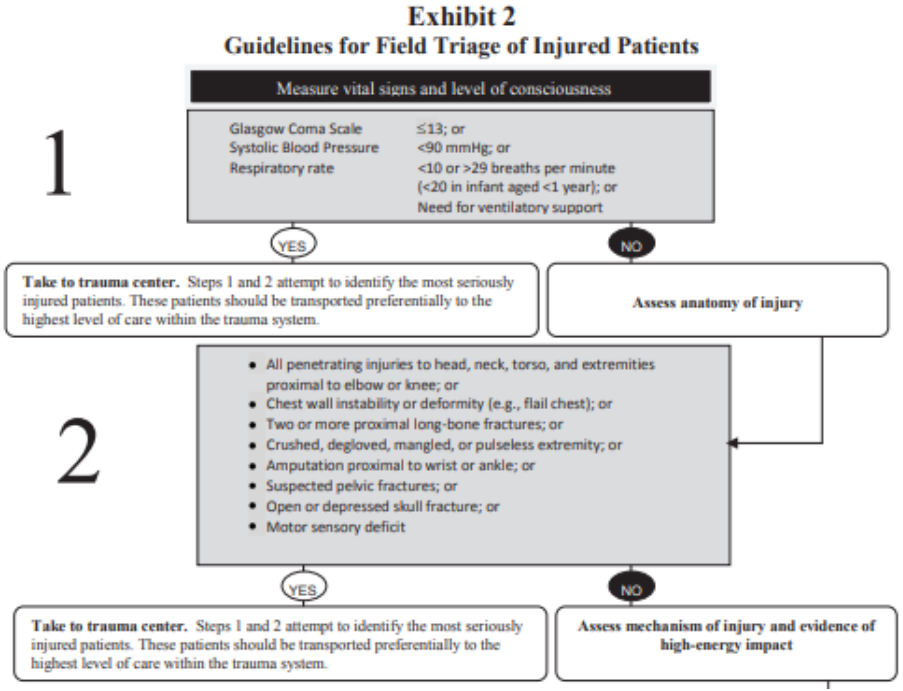
Field Triage Criteria



Oregon Health Authority, 2013

EMS Assessment

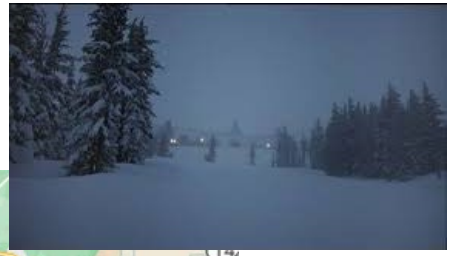
- 45 year old male found supine, blood pooling on the floor
- EMS Assessment
  - A – patient found to be coughing blood
  - B – RR 30 is breathing spontaneously, chest rise and fall is unequal, bubbling from the chest wound
  - C – penetrating chest wound, Lt upper chest – appears pale, cool, and clammy – SBP 95/50, stabilize axe blade
  - D – confused, eyes closed, able to squeeze hand GCS 13



Thoughts on our patient?? Where should he go?

Oregon Health Authority, 2013

Now what????



Battle Ground
Scappoose
Columbia River
5
205
Vancouver
127
14
Camas
84
Columbia River Gorge National Scenic Area
Level 3
Lyle
281
26
Level 1
Non-trauma Center
Level 1
Mt Hood
35
205
12
Sandy
Mt Hood
26
Mt Hood Village
Non-trauma Center
Hotel Location
EMS
Estacada
224
Mt. Hood National Forest
26
216
Pine Grove
Ripplebrook

Oregon Trauma Centers

- Trauma center levels – identify resources available
  - Level 1-4 and Critical Access Hospitals
- Referral pathways to higher level of care
- External review
  - Trauma center designation and/or ACS verification
  - Meet requirements for annual volume
- Public accountability

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Why a Trauma Center

Hospital Definitive Care

- Emergency Physician, Trauma Surgeon, and Anesthesia in house
- Rapid OR and IR Access
- Large blood supply
- Access to specialty services
- Evidence based protocols
- Critical care management

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Trauma Team Activation

OREGON HOSPITAL TRAUMA TEAM ACTIVATION CRITERIA

Systolic blood pressure <90 mmHg; or
Respiratory rate <10 or >29 breaths per minute (<20 in infant aged <1 year); or
Need for ventilatory support; or
Glasgow Coma Scale <9; or
All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee; or
Chest wall instability or deformity (e.g. flail chest); or
Two or more proximal long-bone fractures; or
Suspected spinal cord injury with motor sensory deficit; or
Transfers requiring blood transfusions; or
Emergency physician's discretion.

YES → **Activate Full Trauma Team**

Full Trauma Team

- General Surgeon
- Emergency Physician
- Emergency Nurse(s)
- Laboratory
- Radiology
- Respiratory Therapist

Response times from patient arrival:
Level I and II – 15 min.
Level III and IV – 30 min

Glasgow Coma Scale of 9 - 13; or
Crushed, degloved, mangled, or pulseless extremity; or
Amputation proximal to wrist or ankle; or
Open or depressed skull fracture; or
Suspected pelvic fracture; or
Falls
- Adults: >20 feet (one story is equal to 10 feet); or
- Children: >10 feet or two or three times the height of the child; or

High-risk auto crash
- Intrusion, including roof: >12 inches occupant site; >18 inches any site; or
- Ejection (partial or complete) from automobile; or
- Death in same passenger compartment; or
- Vehicle telemetry data consistent with a high risk of injury; or

Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact; or
Motorcycle or ATV crash >20 mph; or
EMS provider or receiving hospital judgment

YES → **Activate Modified Trauma Team**

Modified Trauma Team

- Emergency Physician
- Emergency Nurse(s)
- Laboratory
- Radiology

CO-MORBID FACTORS

Older Adults
- Risk of injury/death increases after age 55 years; or
- SBP <110 might represent shock after age 65 years; or
- Low impact mechanisms (e.g. ground level falls) might result in severe injury; or

Children
- Should be triaged preferentially to pediatric capable trauma centers; or

Pregnancy >20 weeks; or

Burns
- Without other trauma mechanism: triage to burn facility; or
- With trauma mechanism: triage to trauma center; or

Anticoagulants and bleeding disorders
- Patients with head injury are at high risk for rapid deterioration; or

Time sensitive extremity injury

Oregon Health Authority, 2016

Avoid the Pitfalls

- Go back to ABCDE if the patient deteriorates
- Don’t be distracted by the injuries
- Assume hemorrhagic shock until proven otherwise
- Avoid going to CT Scan/Radiology if the patient is unstable
- Do not delay transfer to higher level of care for tests

Kostiuk & Burns, 2022

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A Little Bit About Blood Loss

Principles of Hemorrhage Control

- Limit or omit fluid administration, early use of blood products
- Monitor permissive hypotension
- Target coagulopathy
- Prevent and treat hypothermia
- Early use of tranexamic acid

(Boffard, 2016)

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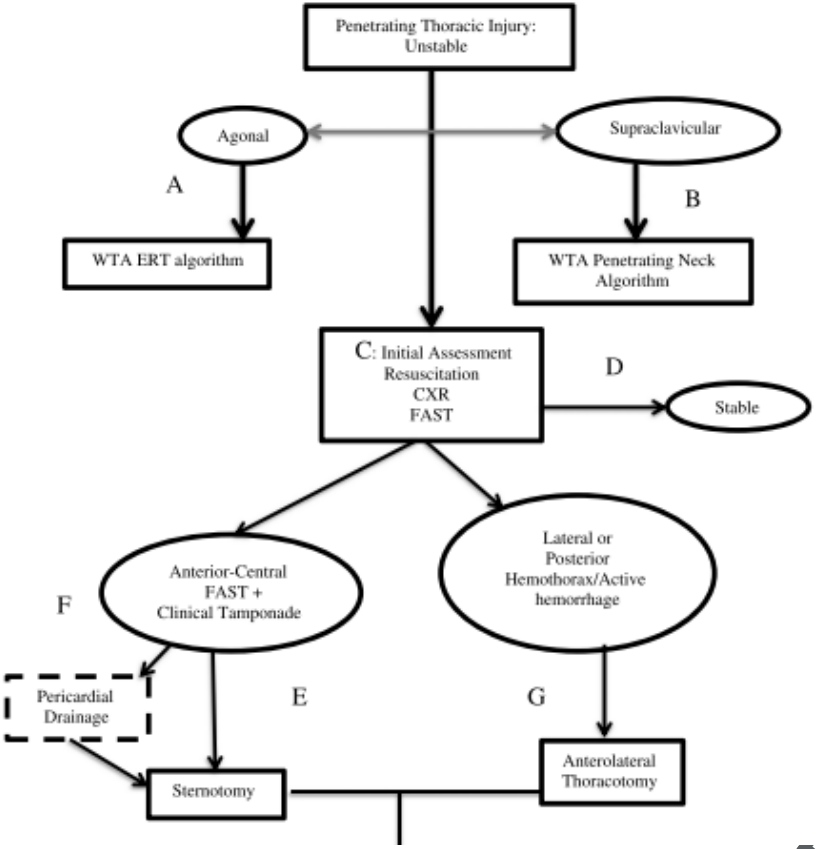
Critical Decision Point

- Resuscitation
  - ED Thoracotomy
- Damage Control Surgery +/- ongoing surgical care



Western Trauma Association

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Phases of Hospital Care

Early Rehabilitation

- Resuscitation
  - Emergency Care
  - Operating Room
- In-Patient Care
  - Intensive care
  - Trauma ward
  - PT/OT/SLP starts in acute phase of care

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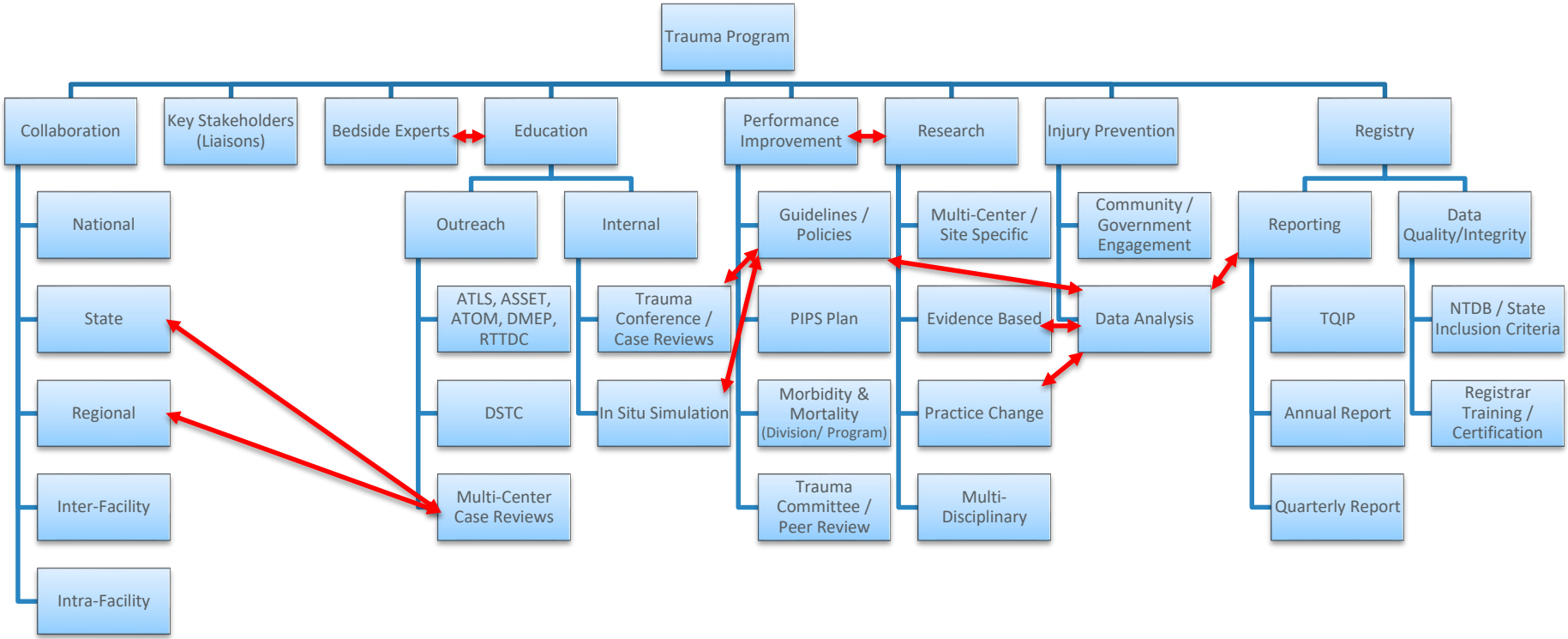
Rehabilitation

- Skilled Nursing Facility
  - Short-term temporary housing with skilled nursing
- Inpatient Rehabilitation
  - Specialized hospital units
  - Specialized technology
- Considerations
  - Program intensity
  - Length of stay
  - Physician access
  - CNA vs. RN care
  - Cost

Gaunt, 2021

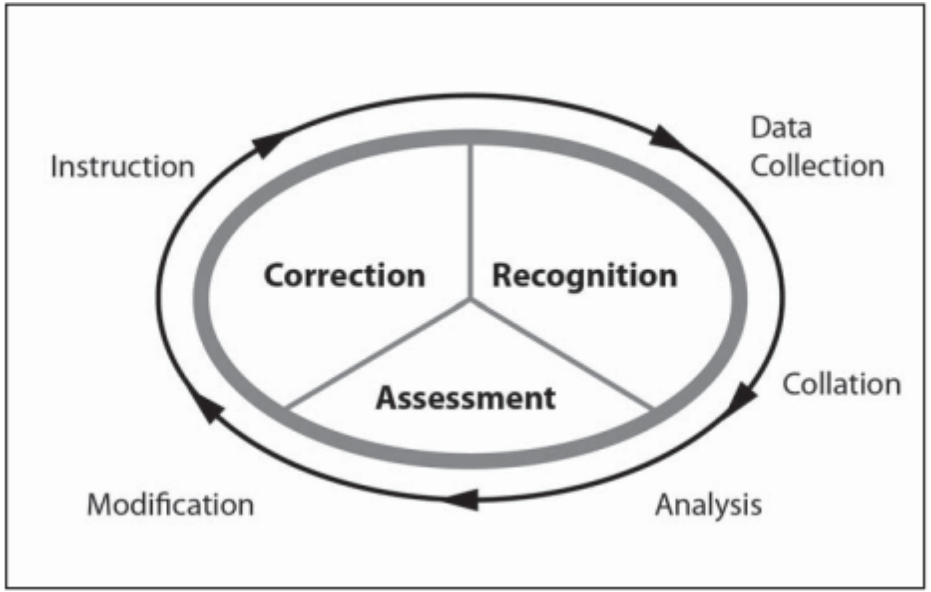


Foundation of a Trauma Program

Adapted from (Gosnell & Slivinski, 2021)

Performance Improvement and Patient Safety

- Trauma Registry
  - Demographics
  - Injury details
  - Pre-Hospital information
  - Hospital Care
  - Support quality, research, and injury prevention
- Benchmarking
  - ACS Trauma Quality Improvement Program (TQIP)
  - National Trauma Data Bank (NTDB) inclusion criteria
  - Against other Level 1 Trauma Centers



American College of Surgeons, 2014, pp. 114

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OHSU PIPS Process

- Reduce variation in care
- Evidence-based, validated resources
- New guidelines are developed and implemented as needed
- Quarterly review to ensure compliance with guidelines

- Identified by team
- Pre-reviewed by faculty
- Discussed Trauma M&M

- Quarterly
- Annual
- Ad Hoc

- Defined criteria & metrics
- Identified by team
- Discussed Trauma M&M

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Outcomes

Recovery and Re-Entry

- Physical recovery
  - Return to pre-injury function
  - Functional independence
  - Return to work
- Emotional recovery
  - Acute stress disorder/PTSD
- Quality of life
  - Outcomes differ patient to patient

Score outcome	Category
1	Dead
2	Vegetative state
3	Lower severe disability
4	Upper severe disability
5	Lower moderate disability
6	Upper moderate disability
7	Lower good recovery
8	Upper good recovery

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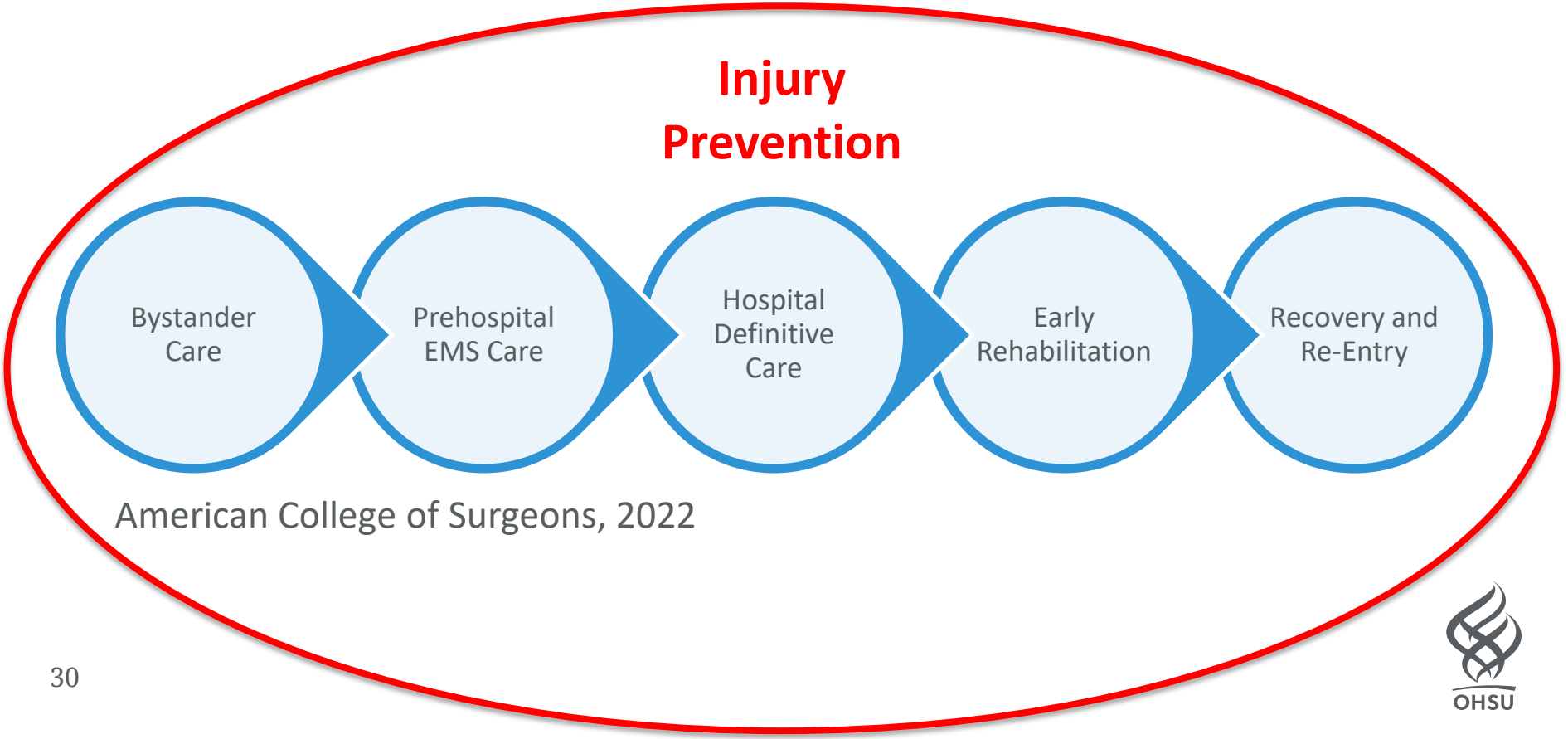
Elements of Care in Trauma



American College of Surgeons, 2022

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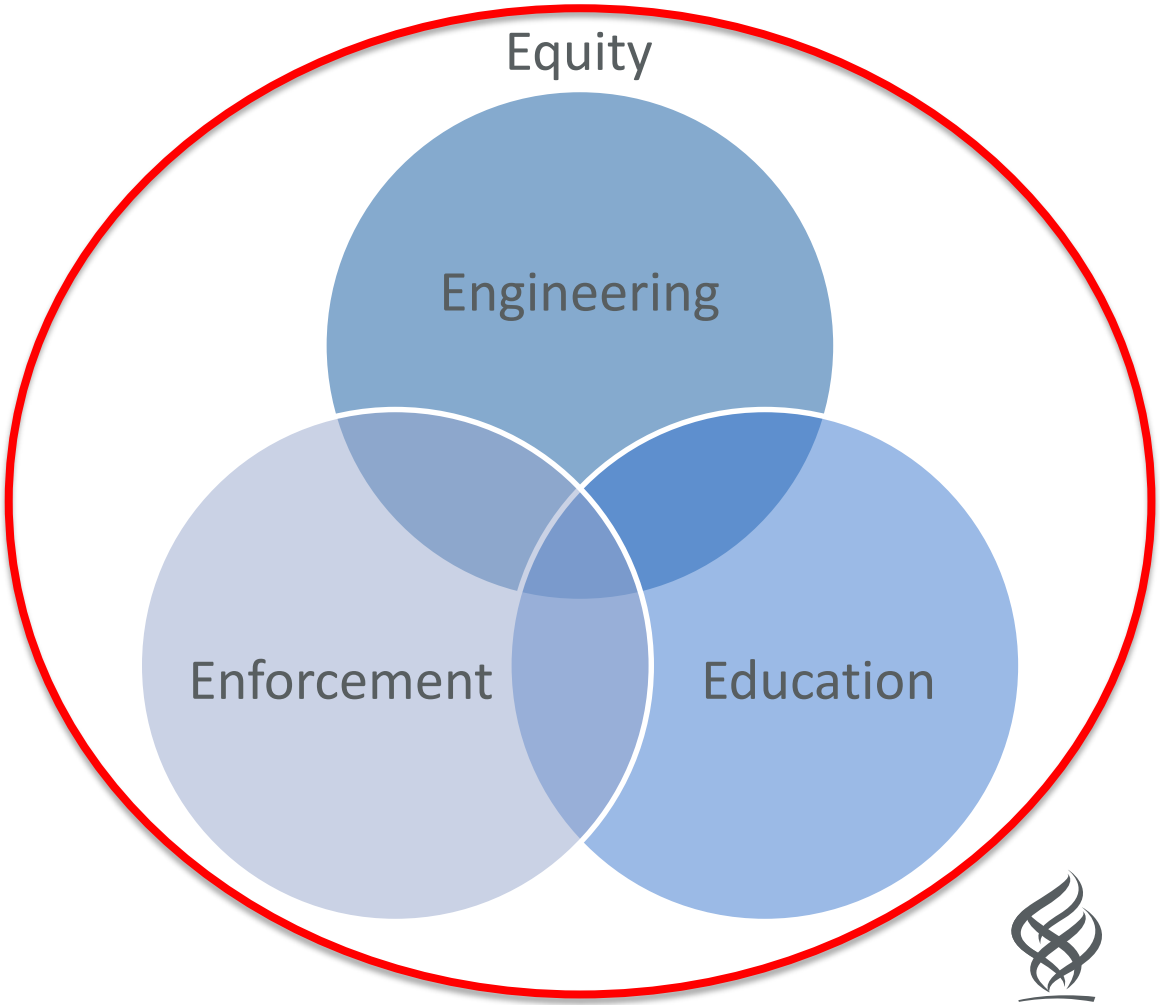
Injury Prevention

- Data driven
- Community & government partnerships
- Entire population



Giles, Bauer, & Jull; 2020

Transport Accident Commission Victoria, 2020
https://www.youtube.com/watch?v=k2tOye9DKdQ

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Thank You