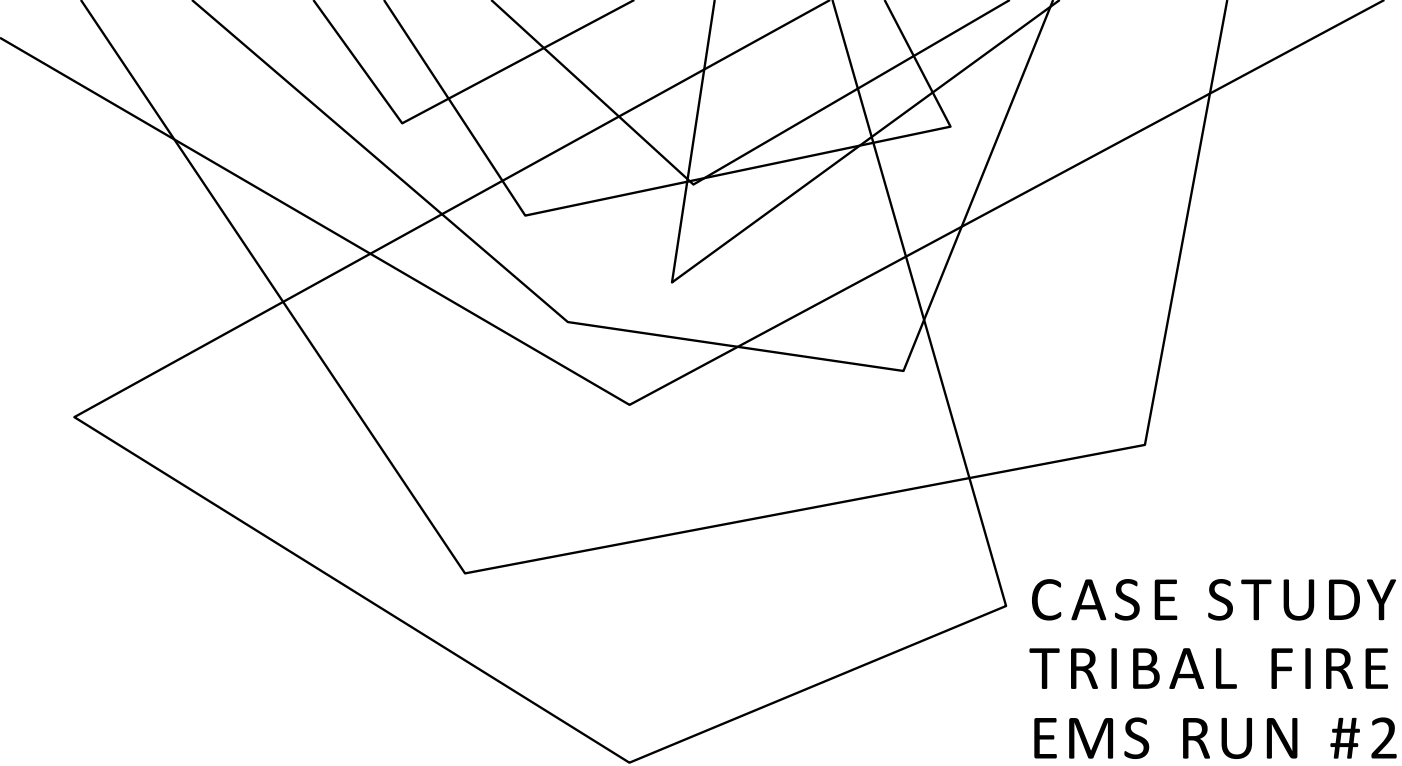


CASE STUDY
TRIBAL FIRE
EMS RUN #23-123

BY BOBBY MCALLISTER
FIREFIGHTER/MEDIC

CommonSpirit

CREW STAFFING
MEDIC 41:

FF/EMT-BROWER
&
FF/MEDIC-
MCALLISTER

BRUSH 41:

CAPTAIN/MEDIC-
WEATHERS

DISPATCH INFO:
MVC 2 PPL LAYING

IN ROADWAY CAR IS IN SOMEONE'S YARD.

Dispatched Time: 0126

Enroute Time: 0130

Arrival On-scene Time: 0137

Begin Transport Time: 0155

St. Anthonys ER Arrival Time: 0208

Note: 12-minute total transport time.

Transfer of Care Time: 0210

ER Cleared Time: 0251

NUMBER OF PATIENTS ON SCENE: 2 TOTAL

PRIMARY CASE STUDY PT

48 year of female

- **Possible Injuries: Yes**
- **Initial Patient Acuity: Critical (Red)**
- **Alcohol/Drug use Indicators: Drug Paraphernalia at scene &Patient Admits to drug use.**

CommonSpirit

TRAUMA/INJURIES
MECHANISM OF INJURY: BLUNT

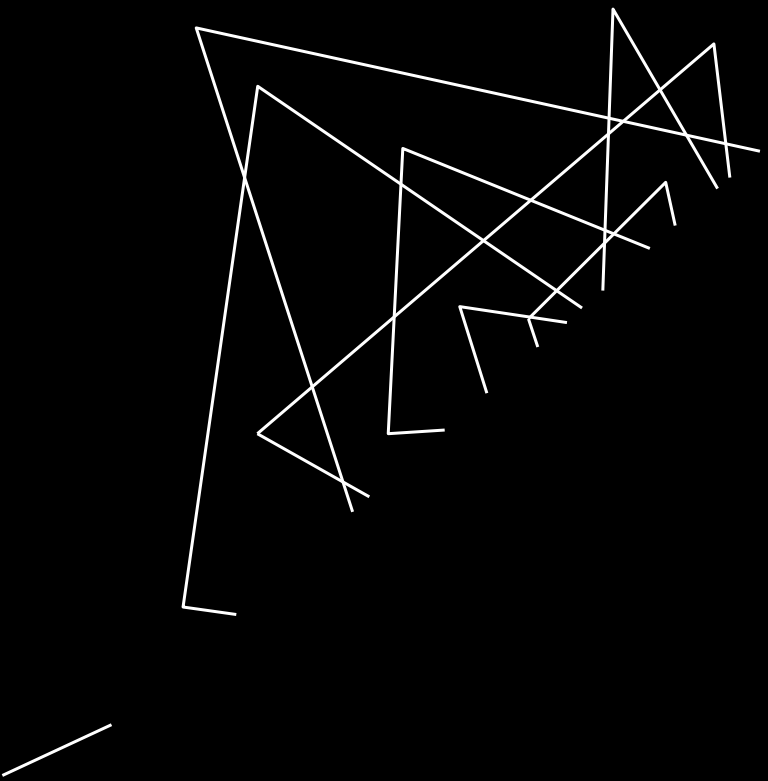
Trauma Center Criteria

- Chest wall instability or deformity
- Systolic BP <90
- Glasgow Coma Score <= 13

Other Injury Factors

- Crash Ejection (Partial or complete) from automobile.
- EMS Provider Judgement

Location of Pt in vehicle: Front Seat- Right side
Airbag Deployment- Front



SYMPTOMS AND IMPRESSION

Primary Symptoms: Unspecified multiple injuries.

Primary Impression: Multiple injuries.

Secondary Impression: Injury-Thorax/thoracic spine.

PERTINENT EXAM FINDS:

Skin: Pale, Dry &Cold.

Mental Status: Confused &Semi Alert

Eyes: Bilateral: 1-mm or 2-mm Non-Reactive

Chest/Lungs: Breath Sounds-Equal, with Breath Sounds Decreased Right & Left. Pain noted upon palpation and movement.

Back/Spine: Pain increased with range of motion.

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VITALS:

One set of vitals was obtained due to having one Zoll monitor being used for two critical patients and need for other critical interventions i.e. IV access, medications/fluids.

BP	HR	RR	GCS
89/48	104	10	Eyes 3- Opens eyes to verbal stimulation
	Rapid/thready	Labored Effort	Verbal 4- Confused

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NARRATIVE – SOAP FORMAT

- S: Medic 41 dispatched for a MVC 2 ppl laying in roadway car is in someone's yard. On scene Pt states she was ejected from the car due to not wearing her seat belt. Pt states she has back pain. Pt states she has chest pain during transport. Shortly before arrival at SAH ER the Pt states she is now experiencing shortness of breath.
- O: Medic 41 arrived to find a 48yof laying on the ground on top of the windshield of the car. Pt was roughly 10-15yards away from the crashed vehicle. Pt was semi alert however disoriented/confused. Pts initial GCS was 14 then declined to a GCS of 13. Pts Airway- Patent with no FBAO noted, Breathing- 10 breaths per min semi-labored with shallow respirations, Circulation- 104HR with no active external bleeding noted and equal rapid thready pulses. Patient Exam: Skin- Pale, cold and dry. HEENT: Head- Intact with S/S of trauma, Eyes- Equal bilateral with constriction, ENT- Clear x3 with Neck/C-spine- No reported neck pain however S/S of trauma including back pain, no S/S of TD or JVD. Chest: unstable sternum with S/S of trauma, lung sounds are clear and equal bilaterally with equal shallow chest rise and fall.

NARRATIVE- CONTINUATION

Abdomen: soft, not rigid or tender with no palpable pulsating masses. Pelvis: Intact with no separation. Extremities: Neuros and distal pulses are intact X4, Capillary refill of 2-4 seconds and patient has equal grips. Pt did not speak much due to pain and due to being hemodynamically unstable.

A: Multi-system trauma rule/out secondary injuries, brain stem herniation, tension pneumothorax, hemopneumothorax, organ/musculoskeletal damage.

P: Dispatched/Enroute Code 3, Arrive on Scene, Scene Size up, Scene Safety/BSI, Alert brush 41 of two trauma entries with ejections, General Impression, Introduce self to Pt, ABC's, Rapid Trauma Assessment, Move Pt onto backboard and secure with straps, Lift Pt onto gurney and secure with straps, Load into Ambulance and move backboard/Pt to bench seat/secure with seat belts, Turn heater on, Primary Pt Assessment, Vitals, Assist with locating/loading 2nd Pt into Ambulance, Decision to Transport/Transport code 3 to SAH, Trauma Entry code 3 HEAR Report to SAH ER via HEAR radio by Driver, 4- 18ga IV attempts RT/LF AC unsuccessful, 45mm Humoral IO insertion with success, LR wide open, Secondary Pt Assessment, Arrive at SAH ER, 1gram TXA in 100ml over 10 with ER docs approval, Pt Pass off report to receiving RN and ER Doc while waiting for gurney to move Pt to Trauma RM, Assist ER staff with Pts due to Pt coding and CPR being started, Decon/Clean up, Medic 41 clear enroute to pick up Brush 41.

PROCEDURES & MEDICATIONS

IV Access RightAC	**IV Access RightAC**	**IV Access LeftAC**	**IV Access LeftAC**	**IO Access Right Humeral**
18ga Unsuccessful 1st attempt BW	18ga Unsuccessful 2nd attempt BM	18ga Unsuccessful 1st attempt BW	18g Unsuccessful 2nd attempt	45mm Successful
Lactated Ringers 1000mL	**Tranexamic Acid (TXA) 1gram in 100mL over 10mins**			
Given through IO	Given through IO			

CommonSpirit

NOTES:

Delays:
Response: None/No

Delay Scene: Triage/Multiple Patients- Second Pt was agitated and uncooperative with EMS. The delay in transport time due to second Patient was estimated to be around 5-8 minutes.

Transport: Other; Route Obstruction (e.g., Train)

Turn-Around: Clean-up; Decontamination; EMS Crew Accompanies Patient for Facility Procedure

Patients History: No medications or PMHx (Past medical history) noted along with NKDA's (No known drug allergies).

THANK YOU

Bobby McAllister

Firefighter/Paramedic

Umatilla Tribal Fire Department

Rural Trauma Case Presentation

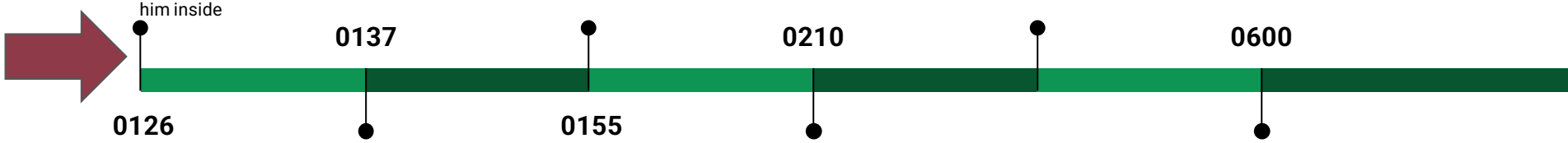
Shannon Servin-Obert, DO
April 24th, 2024

CommonSpirit

Disclosures

- None to report

Timeline



0126

Bystanders call 911

Dispatch was notified that bystanders heard a huge crash outside their house, they found one man in the yard and brought him inside

0137

EMS at the Scene

They made contact with the second patient and started their triage process

0155

EMS departs the scene

They depart the scene at 0155 driving Code 3 to SAH. Full trauma x2 activated @ 0159

0210

Patient Arrives at the ED

The patient arrives with GCS of 6 and hypotensive

0600

Patient Management

Intubation, CPR, Procedures, blood products

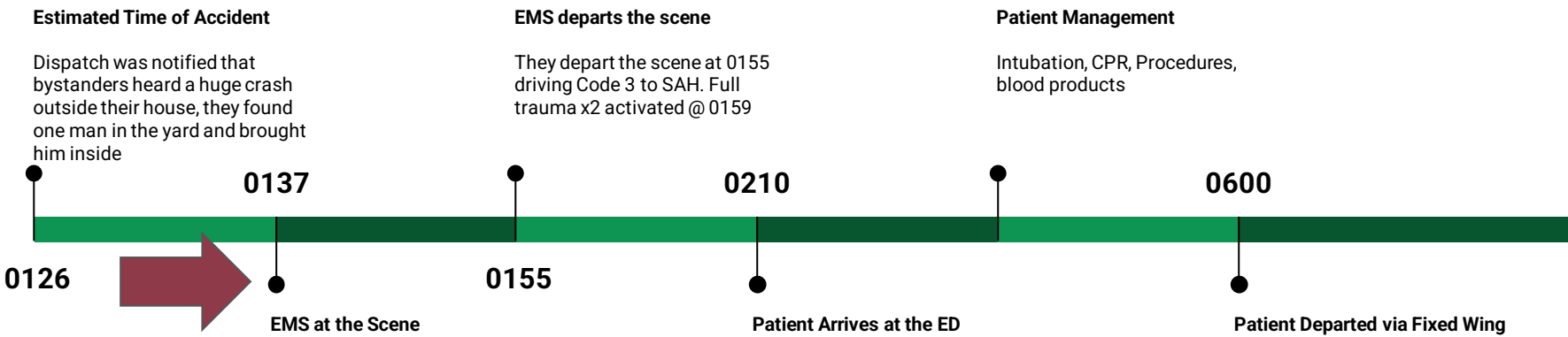
Patient Departed via Fixed Wing

The patient was transferred to OHSU

Incident

- Rollover MVC, unknown rate of speed
- There were two patients, both ejected
- Patient:
  - Late 40's (unknown at the time)
  - Unrestrained passenger
  - She was found by EMS in the road, laying on the windshield, 10-15 yards away from the car
- Outside temperature was about 25°F

Timeline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0137
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0210
0600
EMS at the Scene
They made contact with the patient and started their triage process
Patient Arrives at the ED
The patient arrives with GCS of 6 and hypotensive
Patient Departed via Fixed Wing
The patient was transferred to OHSU

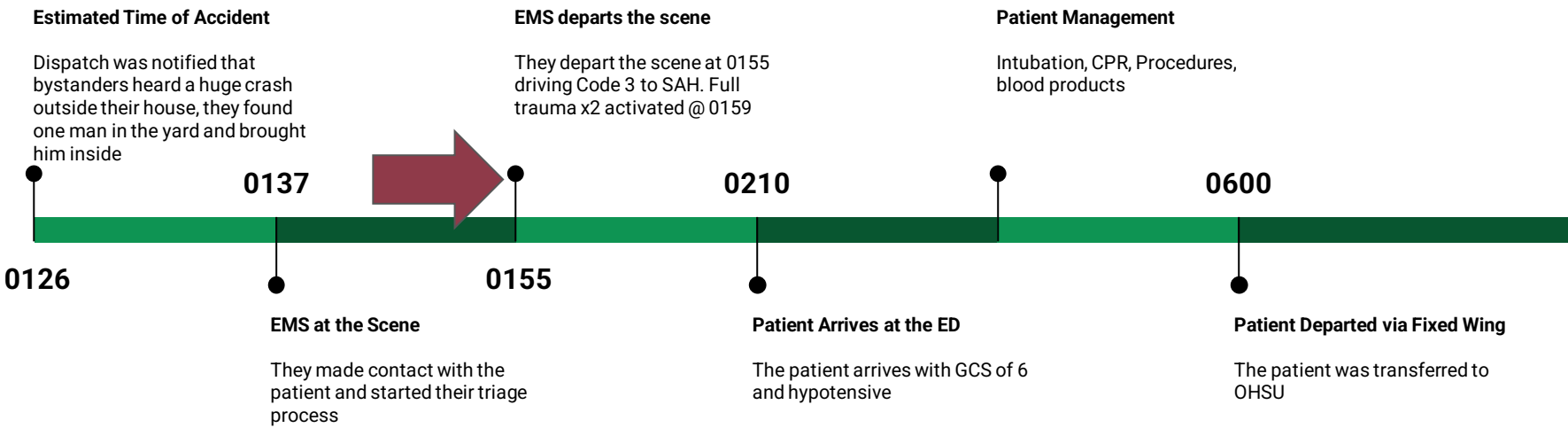
Pre-hospital

- EMS arrived on scene to find two patients
  - they tone out for assistance to their Fire Chief
  - note: one ambulance crew services this ASA
- Patient presentation:
  - alert, but confused; GCS 13
  - vital signs:
    - BP: 89/48
    - HR: 104
    - RR 14, labored

Pre-hospital

- IV access
  - difficult IV start, right humeral IO placed
- Medications
  - LR
  - 1g TXA
- Immobilization
  - backboard
  - cervical collar

Timeline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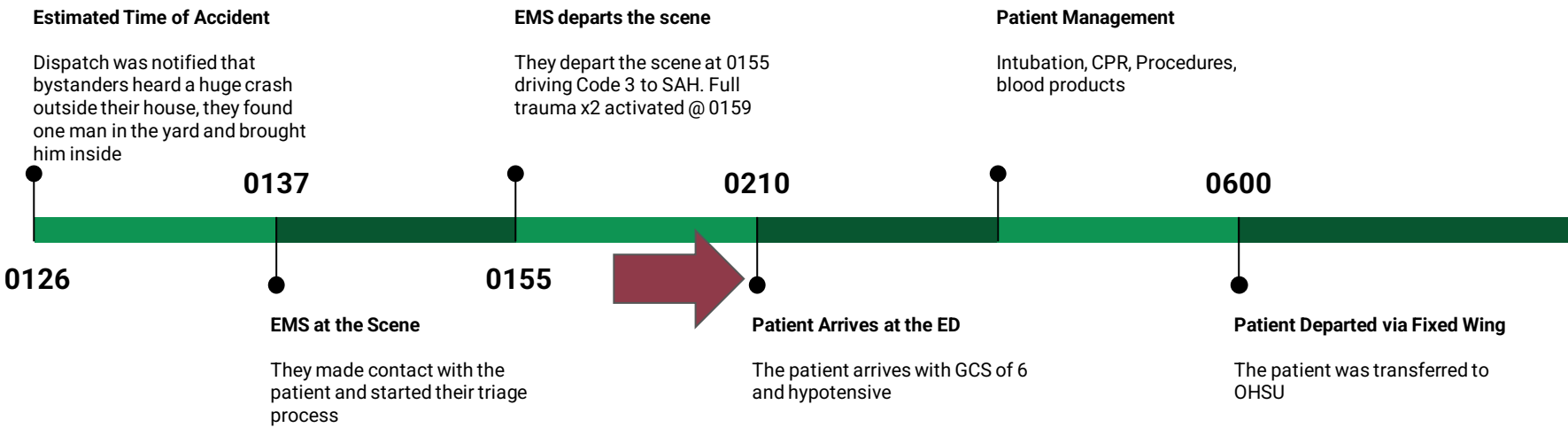
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Available Staff

ED personnel:

1. ED MD
2. 2 RNs

House Supervisor

Respiratory Therapist

Lab Technician

CT/XR Technician

CCU Nurse

Trauma Surgeon (he took primary on patient #2)

EMS crew

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Initial Presentation-ED

- GCS 6 (2, 2, 2)
- Vitals:
  - BP- 79/50
  - HR- 99
  - RR- 24
  - O2- 96% (Room air)
  - Temp- 93℉
- Skin was mottled with diffuse bruising
- No external bleeding noted

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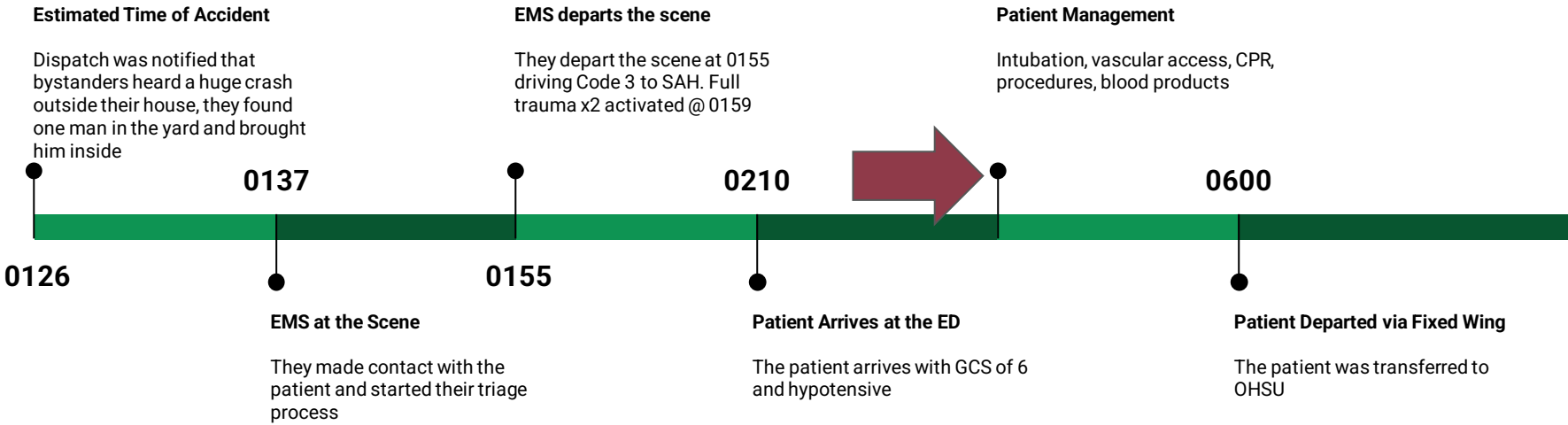
Timeline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ED Stabilization

- Shortly after arrival, the patient began to desaturate
  - 0220- the patient was intubated
    - verified with ETCO2
- Immediately after that the ED provider placed an IJ triple lumen central line (during placement, pulses lost, ROSC achieved)
- Chest XR showed L PNX
  - Chest tube was placed
- Warming measures
  - Bair hugger, warmed room, warm IV fluid, blankets

ED Stabilization

- 0230 - the patient was pulseless
  - after two CPR cycles, 1 round of epi, pulses returned and remained
- Norepinephrine drip started and titrated for hypotension
- First unit of emergent release O- blood started at 0306
  - She received a total of three units (4th sent with LF)
- 0320 - Transport to CT with RN, RT, and MD
  - Returned to trauma bay @ 0346

ED Stabilization

- CT showed that the chest tube did not completely resolve the PNX
  - hemi/pneumo on the left
  - right hemothorax as well

Imaging

Imaging

- Head/neck CT
  - Negative for a acute traumatic injury
- Chest
  - 300mL right hemothorax
  - Moderate anterior left pneumothorax
  - Flail chest of the left hemithorax involving ribs 2-7
  - Extensive pulmonary contusions w/ multi-segmental atelectasis
  - T8 pedicle fracture

Imaging

Abdomen/pelvis:

- Large peritoneal hematoma with acute contrast extravasation near the internal iliac artery
  - bladder was displaced 2/2 the hematoma
  - no noted bladder injury though. The bladder was decompressed by the MD with no blood return
- Compression mechanism pelvic fractures
  - Too many to list

Labs

Lab Results

	Mar 09,23 04:50	Mar 09,23 02:50
WBC	24.7 H	20.4 H
RBC	3.81 L	3.60 L
Hgb	11.0 L	10.0 L
Hct	35.0	31.9 L
MCV	91.8	88.8
MCH	28.8	27.9
MCHC	31.3	31.4
RDW	14.8	13.9
Plt Count	230	239

	Mar 09,23 05:00	Mar 09,23 03:07
pH	7.09 L	7.07 L
pCO2	51.3 H	51.7 H
pO2	62 L	106
HCO3	15.6	14.9
Total CO2	17.2	16.5
Base Excess	-13.9	-15.0
O2 Saturation	85.4 L	96.6
Oxygen Given	88	100

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Lab Results

	Mar 09,23 04:50	Mar 09,23 02:50
Sodium		137
Potassium		5.8 H
Chloride		108 H
Carbon Dioxide		19 L
Anion Gap		15.8
BUN		21 H
Creatinine		1.16 H
Est GFR (CKD-EPI)		42 L
BUN/Creatinine Ratio		18.10
Glucose		351 H

	Mar 09,23 04:50	Mar 09,23 02:50
Lactic Acid	5.1 *H	
Calcium		8.1 L
Total Bilirubin		0.3
AST		94 H
ALT		67 H
Alkaline Phosphatase		77
Total Protein		5.2 L
Albumin		2.4 L
Globulin		2.8
Albumin/Globulin Ratio		0.86 L

Hospital Blood Bank Supply

PRBC UNITS	QUANTITY
O+	8
O-	4
A+	8
A-	4
B+	4
B-	2
AB+	2
AB-	2

- Also available: FFP

CommonSpirit

Back to Stabilization

ED Stabilization

- 0350: pelvic binder was placed
- 0400: 2 chest tubes were placed on the left side
  - Second trauma patient had been stabilized at this point
  - Surgeon assisted by placing the second left side chest tube
- 0415: chest tube was placed on the right side

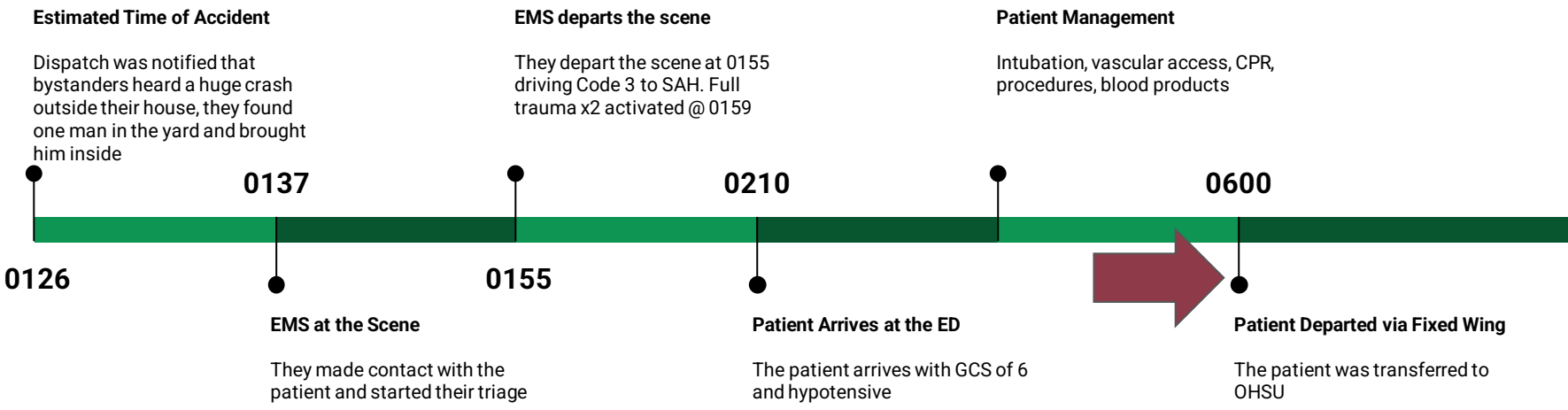
ED Stabilization

- Intermittent hypotension throughout stabilization
  - NS boluses
  - 3 units PRBCs (4th unit given to LF)
  - norepinephrine drip titration
- TXA (1st g given by EMS)
- Boostrix
- Versed for sedation
- Fentanyl
- Fluids

Coordinating Transfer

- 0357 - Notified Life Flight we anticipated a transfer imminitely
- 0421 - Acceptance from OHSU
- 0515 - Life Flight crew arrived to package up the patient
- 0600 - The patient departed the ED in a ground ambulance to the airport

Timeline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Trauma Case Review

Interfacility Transport:
St Anthony Hospital, Pendleton to OHSU, Portland

Sam Gwinn FP-C, CCP-C, C-NPT
Regional Clinical Education Manager
Life Flight Network

Life Flight Network Arrival

Initial Patient Assessment

Airway: Intubated; hypoxic. Diminished and coarse lung sounds.

Breathing: On ventilator. Flail segment to L chest. 3 chest tubes (2 on left, one on right)

Circulation: Right IJ, 22ga x 2

Neuro: Pupils 1mm PERRL; GCS 5 (1/1/3). Decorticate posturing.

Pelvis: Pelvic fracture with binder

Skin: Capillary refill >4 seconds; mottled and pale

Positive Shock Index (1.4)

Vital Signs

Heart Rate: 125, sinus tach

Blood Pressure: 92/68 (76)

SpO_2: 79% (FIO2 1.0, PEEP 20)

Respiratory Rate:
-Vent rate = 18
-Spontaneous rate = 31

Temperature: 94.4F axillary

$ETCO_2$: 39 mmHg

Care In Transport

Lung Protective Ventilation
-placed on transport ventilator

Blood Products

-2 additional units of PRBCs administered
-Calcium Gluconate 1 gram

Sedation and Analgesia
-Midazolam infusion replaced with Ketamine

Vasopressors
-titrated during transport
-push-dose epinephrine

LFN Care - Timeline

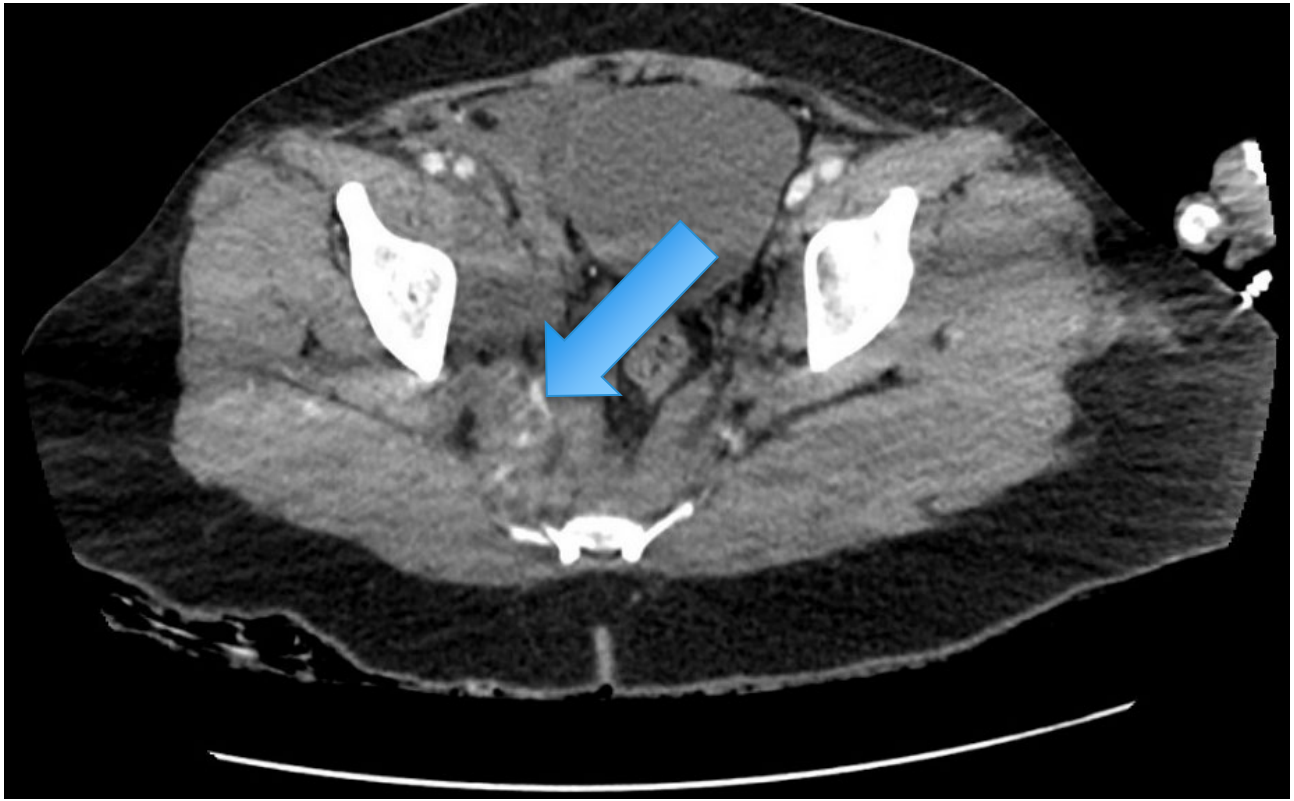
Time	Event	Notes
0526	Life Flight at patient bedside • Heart Rate: 125 • BP: 92/68 • SPO2: 79%	• **Shock Index: 1.35** • Levophed 24mcg/min • Epinephrine 15mcg/min
0618	Life Flight departs via ambulance for airport	
0621	5th unit of PRBC administered	• **Shock Index: 1.2**
0631	Patient loaded into plane	
0800	Plane landed at PDX	
0805	6th unit of PRBC administered	
0806	Ambulance enroute to OHSU	
0816	**BP reads "weak pulse"** 10mcg of epinephrine 1:100,000 pushed	• Levophed 45 mcg/min • Epinephrine 30mcg/min
0824	1 gram of calcium gluconate administered	
0840	Care transferred to OHSU • Heart Rate: 133 • BP: 103/88 • **SPO2: 82%**	• **Shock Index: 1.29** • Levophed 45 mcg/min • Epinephrine 30mcg/min
St Anthony's departure - OHSU transfer of care:	**2 hours 22 minutes**	
Average drive time for 212 mile trip:	**3 hours 25 minutes**	

Whoa!

Mackenzie Cook MD, FACS


A Win for Oregon
Trauma!

Pushed Images



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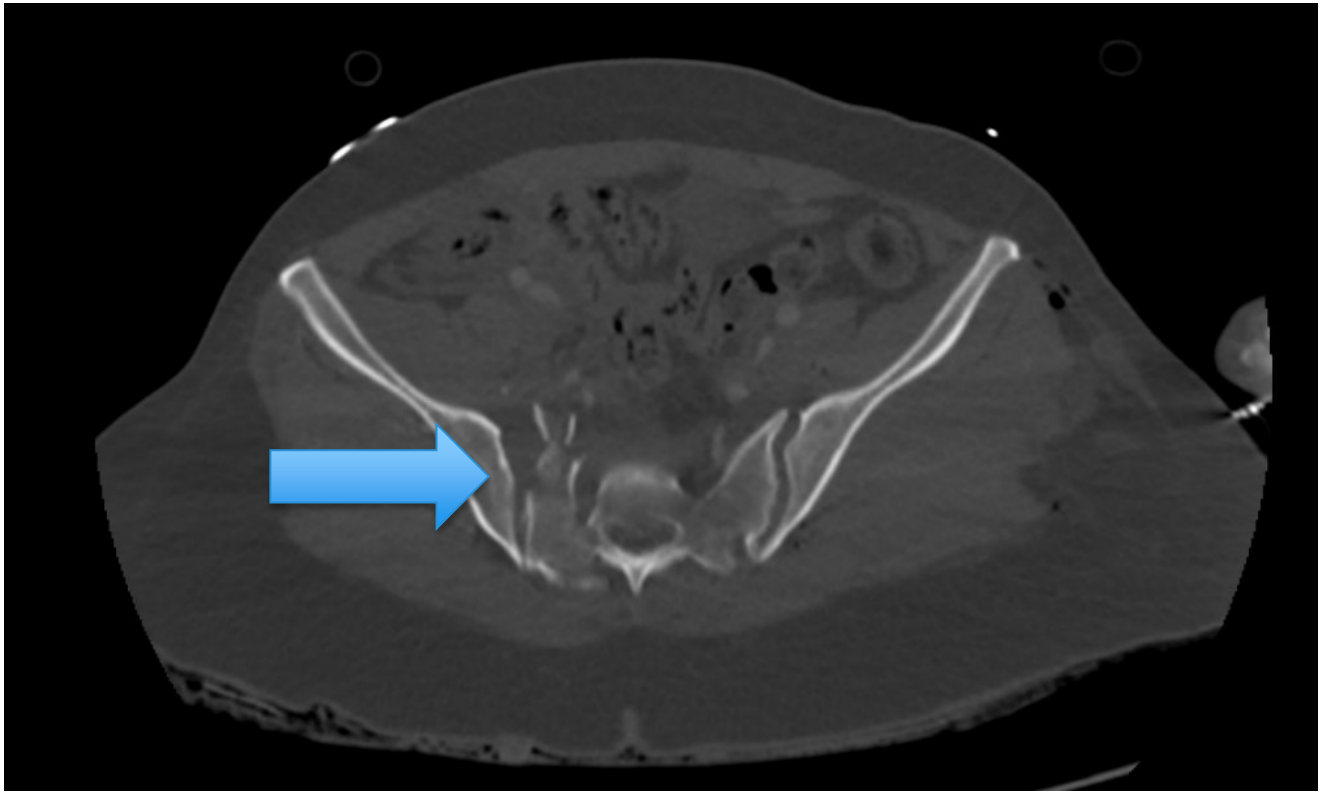
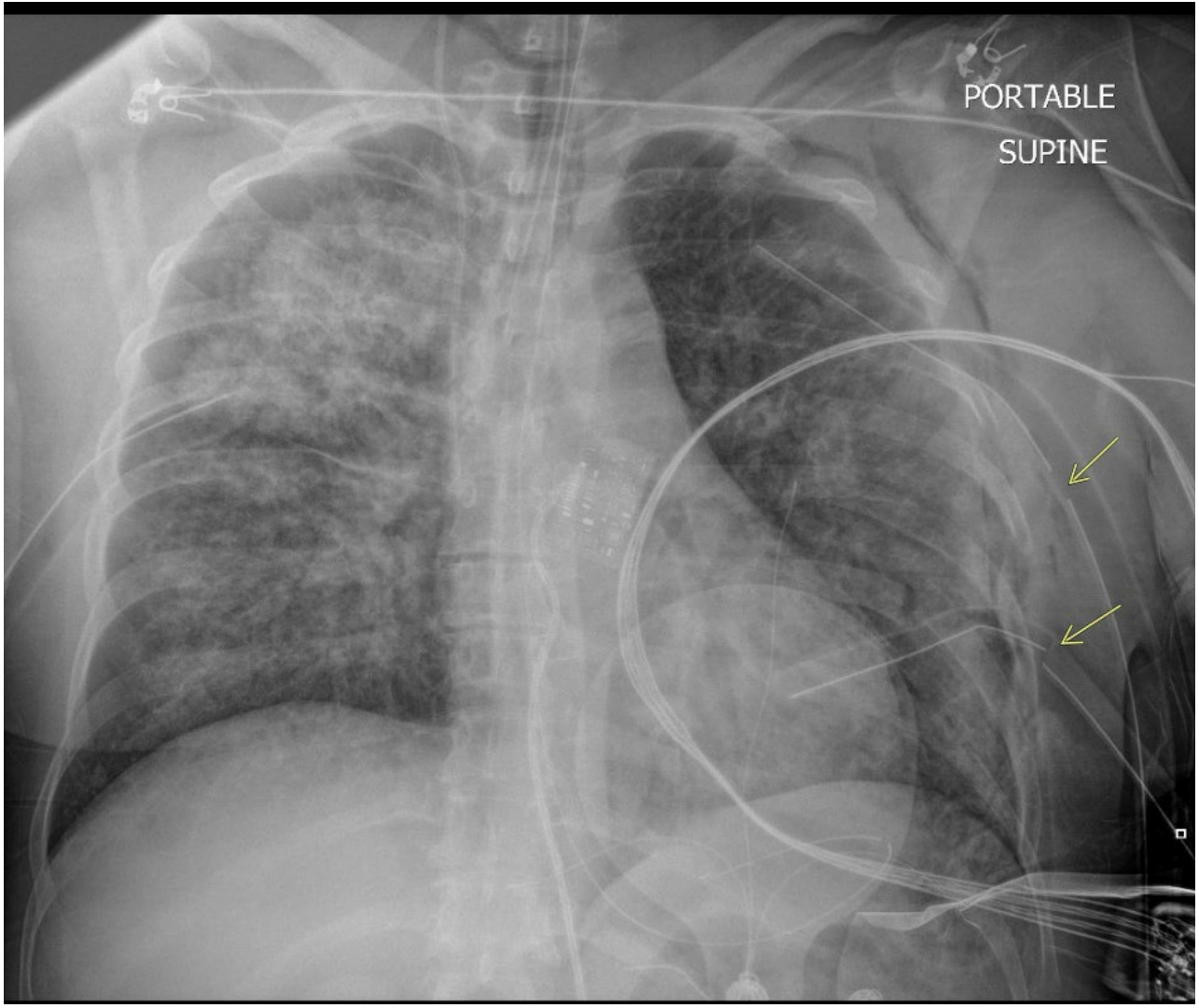


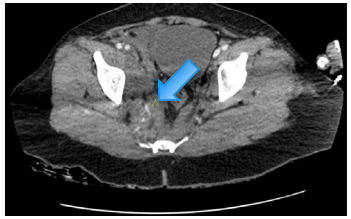
Very Sick Patient

- Arrives at OHSU – 08:30, ~7 hours from time of injury
- 6u blood + Norepinephrine + Epinephrine
- FULL trauma activation:
  - HR: 130, BP: 88/65 EtCO2: 24mmHg


PORTABLE
SUPINE

Very Sick Patient - arrival

- Massive transfusion with Ca^{2+} supplement
- IR at bedside in the trauma bay



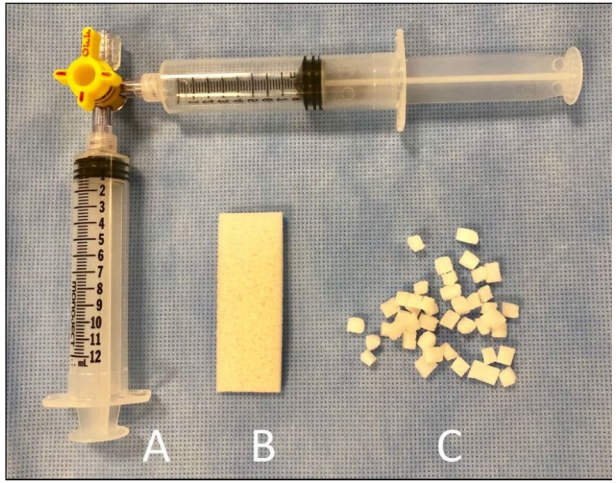
- Patient rolling upstairs in 20 minutes

OHSU

Very Sick Patient – up to IR

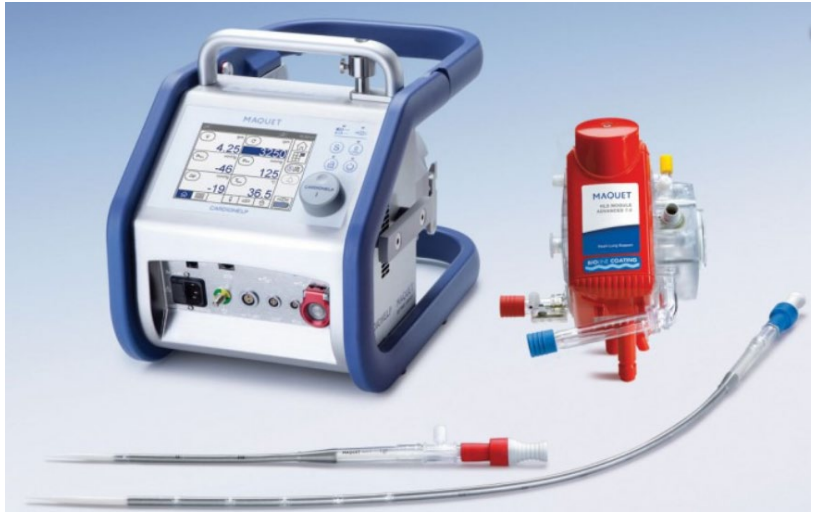
- Massive transfusion ongoing

- Empiric bilateral hypogastric embolization

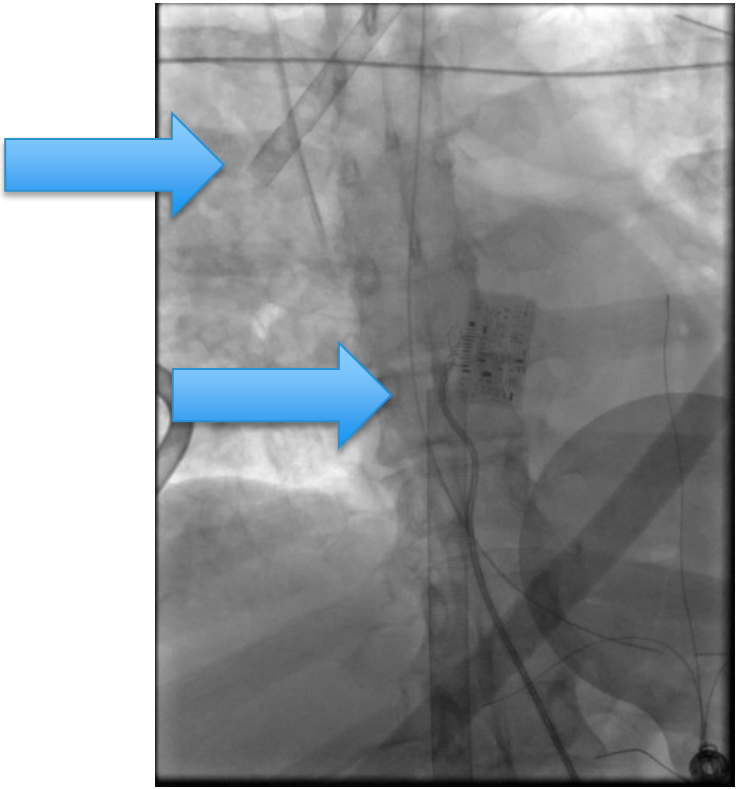


Very Sick Patient – in IR

- 6.98/75/41/18/-13.9 on 100% FiO2
  - TACO? TRALI? Pulmonary Contusions?
- Severe mixed acidemia and hypoxia



VV ECMO Cannulation

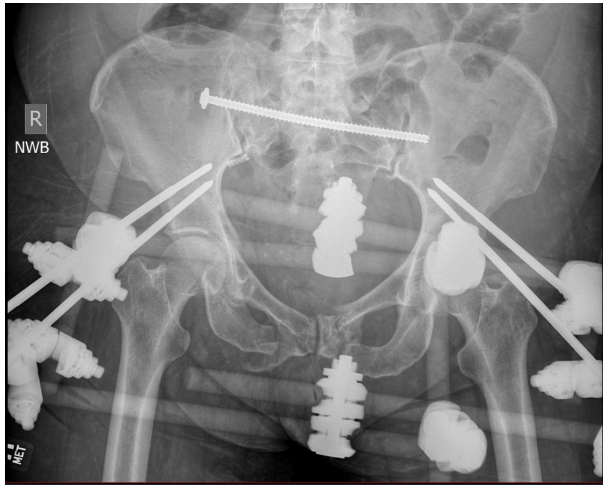


- 08:30 Arrives OHSU
- 08:50 to IR
- 09:30 ECMO Consult
- 10:05 On VV support
- 10:55 Embo. complete

She Got Better!!!

- Decannulated on ECMO / hospital day #6

- Pelvic stabilization – hospital day #8

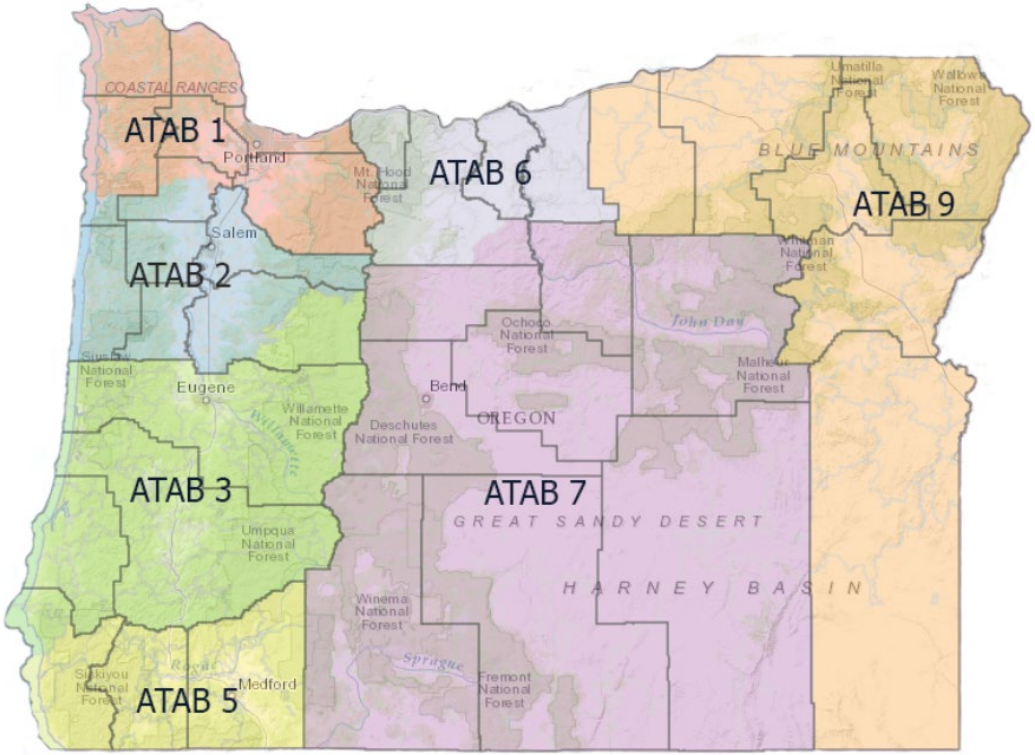


Discharged!!!

- 36 day hospital stay - **DISCHAGED HOME**
- 2 months later: Ex-Fix Removed
- Healing decubitus wounds

#Win

Chain of Survival



Chain of Survival

- Prompt EMS Care
- Rapid initial stabilization
- Rapid / High Quality Transport

OHSU

Thank You

Thank You