• Level 1 Trauma Center
• 115,000 ED visits
• Average 90 activations/month
• About 800 trauma admits annually
Financial Disclosures

- Sadly, none

- I am friends with McEvoy and Beebe but don’t hold that against me.
Objectives

• Understand mechanisms of trauma

• Discuss factors related to destination decision

• Understand current treatment modalities for common types of trauma.

• Discuss trauma center systems of care.
Case 1

- It’s 1:30am, called for man struck by train (subway). PD requesting a “rush on the bus”.

- What are your initial concerns as you respond to the scene?
Scene Survey

- 69 y/o male found lying on tracks, appears unresponsive large amount of blood on ground.

- Obvious bilat lower extremity amputations.

- Not pinned by train, area secured by NYPD. MTA holding trains. No immediate threats.
What Now?

- Unresponsive, GCS 8
  - Intubate?
- BP 80P
- How will you get him out?
- Where should we take him?
On Arrival
Primary Assessment

- **A**: Intubated by EMS on field
- **B**: Breath Sounds equal b/l, clear
- **C**: radial pulses present, skin cool
- **D**: GCS:10T, Pupils 3mm, reactive
- **E**: Traumatic b/l Lower extremity Amputations
Secondary Survey

Vitals: BP 147/105, repeat: 88/56, HR 63, R 14, O2 99%
Gen: Awake, uncomfortable
HEENT: Pupils 3mm and reactive, TMss clear, no oral trauma
Neck: C-Collar in place
CV: RRR
Pulm: Breath sounds equal bilaterally, no crepitus
GI: Abdomen soft, nontender, nondistended
Ext: B/L traumatic BKAs, L leg with macerated tissue above knee
Back: No step-off, normal rectal tone, no blood in vault
Issues on arrival

- Leg stumps still oozing blood
- BP dropped to 59/47
- Patient awake, pulling at ETT
ED Course

- Tourniquets applied to both legs
- Fentanyl given for sedation
- Right subclavian Cordis placed
- Massive transfusion protocol started
Massive Transfusion

- 1:1:1 ratio
- pRBC, FFP, Platelets
- TXA (transaxemic acid)
Disposition

- Admit to OR for debridement and control of bleeding
- Developed necrotising fasciitis
- Multiple re-ops
- Expired
Case 2

- 14 y/o Male
- “I Can’t Breathe Yo!”
Dispatch Info

- Male stabbed
- Location: housing project
- No further info
Scene Size-up

- 14 y/o Male
- Single stab wound to the left neck
- Chief Complaint: “I can’t breathe yo!”
- Spitting blood from mouth
- What are your priorities
Vital Signs

- 138/61
- HR 131
- RR 24
- SpO2 90%
- 2 large bore IV’s placed
Primary Survey

- Airway - “a bloody mess”
- Breathing - gurgling, tachypneic
- Circulation - Strong radial pulses
- Disability - PERL, Moving all 4 ext, alert
- Exposure - No additional wounds
Airway Issues

• What would you do?
• BVM
• SGA
• Intubate
• Surgical
Secondary Survey

- No additional injury found
- No active bleeding from neck wound
ED Course

- Intubation attempted with RSI and double setup
- Intubation unsuccessful and surgical cric done
- MTP initiated
- Taken to OR for Exploration, but nothing found
Hospital Course

- Taken to ICU for monitoring

- Started to re-bleed and taken to Interventional Radiology for angio and embolization.

- Found a bleeding branch of external carotid that was embolized and hemorrhage controlled.

- Decannulated post-op day 2

- Discharged without incident
Case 3

• Motor Vehicle Collision with Ejection
Initial Information

- MVC with ejection on highway
- 46 Y/O Male patient who was unrestrained driver
- Found approximately 60 feet from the vehicle
- Alert, complaining of LUE pain and “road rash”.
Primary Survey

• VS: BP 140/87    HR 150’s    RR18    SpO2 95% ra

• A: Intact, no fluid or blood

• B: CTA bilat, normal effort

• C: Tachy, no external hemorrhage

• D: GCS 15, PERL, MAE

• E: Degloving injury scalp, left shoulder, multiple abrasions
On-Scene

- What are your priorities?
- Transport decision?
- What treatments prior to transport?
Secondary Survey

- Alert, Oriented
- HEENT: multiple scalp abrasions and lac
- Neck: no stepoff or deformity
- Chest: abrasions
- Abd: Distended, firm but non-tender
- Pelvis: tenderness and crepitus right iliac crest
- Ext: Lac left knee. PMS x 4
- Back: abrasions, small avulsion over left shoulder
What now?

- Remains persistently tachycardic
- SBP drops to the 80’s, then 60’s
- Unable to get peripheral IV
- Chest x-ray shows left shoulder dislocation
Trauma Team

- Placed a 8.5Fr introducer in left groin
- Shoulder reduced by ED Attending
- FAST negative
- MTP initiated
The Real Question

- Where is the blood?
  - Scalp?
  - Chest?
  - Lacerations?
  - Abdomen?
  - Pelvis?
  - Street?
Where to?

- CT
- ICU
- OR
- IR
OR

• Ex-Lap
  • negative
• Lacs washout and repair
• What now?
CT

- Head: L frontal skull Fx, non-depressed
- Spine: R L3-5 transverse process and L5 L TP Fx
- Chest: negative
- Abd/pelvis: Acute comm fx of right ilium through acetabulum, inf/sup rami fx
3D Reconstructs
3D Reconstructs
3D Reconstructions
Pelvic Fractures
Case 4

- GSW to the Abdomen
Initial Information

- 20 y/o Male with single GSW to left abdomen
- Found on street, claims he was just walking town the street and he was shot by “some dude”.
- NYPD on scene, no immediate threats
Primary Survey

• A: intact, phonating well, clear speech

• B: CTA bilat, LS clear and equal

• C: Strong radial pulses, no significant hemorrhage

• D: GCS 15, PERL

• E: single GSW LUQ of abdomen

• VS: BP 94/50  HR 90-126  RR16  SpO2 98%
Secondary Survey

- Alert and awake
- PERL, moist MM
- Neck supple, no wounds
- Chest CTA bilat, non-tender
- Abd soft, non-distended, GSW to LUQ with diffuse tenderness
- Ext: no injuries, sensation intact, pulses +2
Now What?

- XRAYS?
- CT?
- ICU?
- Go directly to the OR, do not pass Go, do not collect $200
• Injuries found:

• Through and through mesenteric injury x2

• Through and through Small Bowel Injury

• Through and Through IVC injury with large Retroperitoneal hematoma
Pancreatic head
Case Follow Up

- Went to ICU
- Remained hemodynamically stable
- Discharged home on Day 5
Case 5

- Pedestrian struck by Bus
Initial Scene

- 62 y/o woman pinned under front of bus
- FDNY on scene preparing to lift bus with airbags
- Patients head and upper torso accessible
Primary Assessment

- Awake, alert
- BP 80/P  HR 100  RR16  SpO2 96%
- Airway patent, speaking clearly
- Lungs CTA bilat
- Weak radial pulses, oozing from Right hip/pelvis wound
- CGS 15, PERL
E: Expose

- Large degloving injury of right upper thigh, buttock and pelvis
- Oozing blood but no arterial bleeding
What now?

- Transfusion 2 units pRBC
- Consider TXA
- Where to?
  - OR
  - ICU
  - IR
ED Course

- Continues to ooze blood and get hypotensive
- 3rd and 4th unit of blood ordered
- Left subclavian cordis placed
- Pelvic xray showed sup/inf rami fx
- Plan to go to IR
Interventional Radiology

- Accessed left femoral
- Gelfoam embolization
- VS stabilized
- Transferred to trauma center
Hospital Course

- prolonged wound care
- hyperbarics
- multiple OR washouts
- Back to Spain a few days ago
Case 6

• Man down on subway platform
Scene Info

- 20 y/o male, intoxicated
- found down on platform after getting right leg caught between platform and train
- Scene safe
Primary

- A: patent and clear
- B: CTA bilat, no distress
- C: Radial pulses intact, bilat 18g
- D: GCS 14 (intox)
- E: Mangled RLE, deep lac to RUE

VS: BP 114/60 $\rightarrow$ 77/40 HR 104
Secondary

Extremities:
Right upper extremity with 4x4 cm deep laceration to medial aspect near axilla. No expanding hematoma. 2+ radial pulses
Mangled right lower extremity at popliteal fossa/posterior thigh with dislocated knee and open tibia/fibula fractures
Pulses: R DP faintly palpable, L DP 1+, R PT 1+, L PT 1+
Unable to move RLE, minimal sensation
# Mangled Extremity Score

- **Skeletal/soft-tissue injury:**
  - low energy (stab, simple fracture, civilian gunshot) 1
  - medium energy (open or multiple fracture, dislocation) 2
  - high energy (shotgun, military gunshot injury, crush injury) 3
  - very high energy (as above, plus soft-tissue avulsion) 4

- **Shock:**
  - stable (systolic RR maintained > 90mmHg) 0
  - transient hypotension 1
  - persistent hypotension 2

- **Limb ischaemia:** (*doubled for limb ischaemia > 6h*)
  - no ischaemia (puls present) 0
  - mild ischaemia (pulse reduced or absent, but normal perfusion) 1*
  - moderate ischaemia (reduced capillary refilling) 2*
  - severe ischaemia (no capillary refilling) 3*

- **Age:**
  - < 30 years 0
  - 30 – 50 years 1
  - > 50 years 2

**Score range:** 1 - 14