

# FIXATION ERRORS AND THE DIFFICULT AIRWAY

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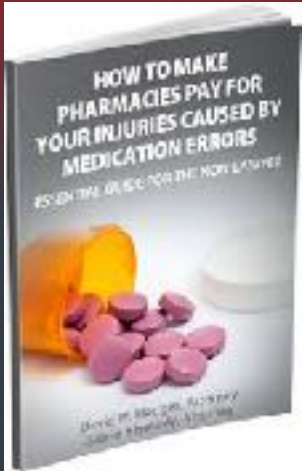
FLIGHT NURSE / YAKIMA BASE MANAGER

# OBJECTIVES

- Review the history of error recognition in health care
- Define what fixation errors are
- Discuss the common causes
- Identify strategies of how to avoid these errors
- Discuss a difficult airway case with high potential for fixation errors to occur

# HEALTH CARE PATIENT SAFETY

- November 29, 1999:
  - “To Err is Human: Building a Safer Health System”
    - Report published by *Institute of Medicine Committee on Quality Health Care in America*
      - Released before ready due to leak to media
      - Estimated as great as 98,000 patient deaths per year as result of medical errors
      - Original intent was not to assign blame but to address key quality components of patient safety



**DOCTORS' DEADLY MISTAKES**

Medical wrecks hit up to 100,000 Americans every a mere per cent of the nation could be cut drastically

**V**ictims of medical errors are often the most vulnerable. They are the elderly, the young, the disabled, the chronically ill, the pregnant, the recovering addict, the recovering alcoholic, the recovering smoker, the recovering drug addict, the recovering patient. They are the most vulnerable because they are the most dependent on the medical system. They are the most vulnerable because they are the most likely to be harmed by a medical error. They are the most vulnerable because they are the most likely to die from a medical error.



**It's time medicine stopped burying its mistakes**

By [Author Name]

Medical errors are a leading cause of death and disability in the United States. Every year, an estimated 98,000 Americans die from medical errors, and more than 2 million are hospitalized. The medical industry has spent billions of dollars on safety programs, but the number of errors has not decreased. It's time for the medical industry to stop burying its mistakes and start addressing the root causes of errors.



**Pittsburgh Post-Gazette**

INSTITUTE OF MEDICINE REPORT RECOMMENDS THAT PRESCRIPTIONS BE COMPUTERIZED BY 2010

**1.5 million hurt by med errors**

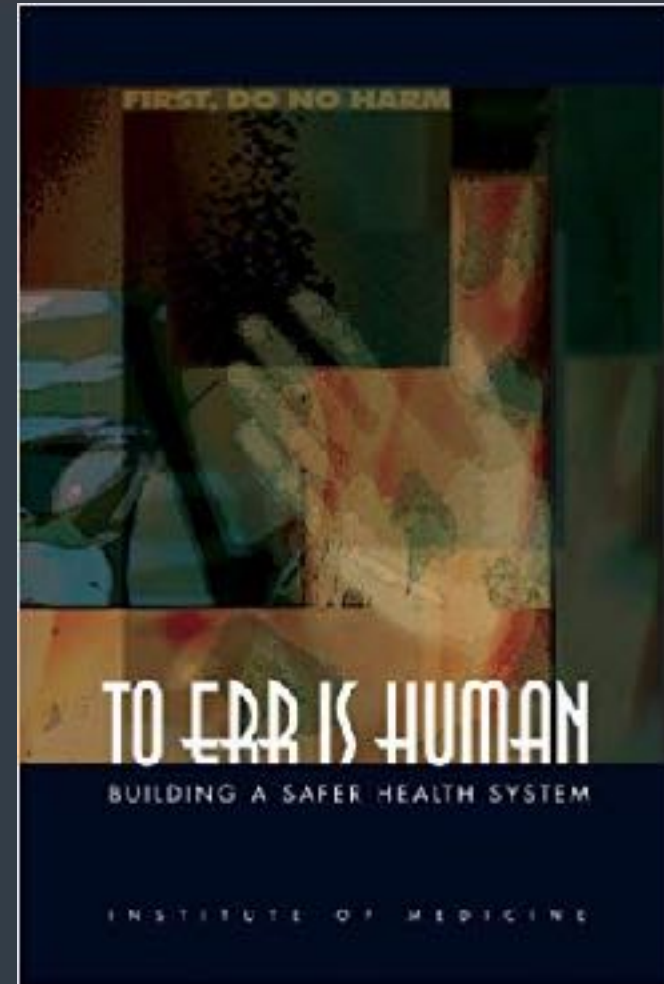
By [Author Name]

A report from the Institute of Medicine (IOM) has found that 1.5 million Americans are injured each year by medical errors. The report recommends that the medical industry take steps to reduce the number of errors, including computerizing prescriptions by 2010.



# HEALTH CARE PATIENT SAFETY

- Committees intended approach
  - “Error” that resulted in patient harm was not a reflection of the health care professionals’:
    - Competence
    - Good intentions
    - Hard work
  - Safety of care is a property of a system of care with attention given to well designed processes of care to prevent harm:
    - Prevention
      - Greatest potential positive impact
    - Recognition
    - Recovery

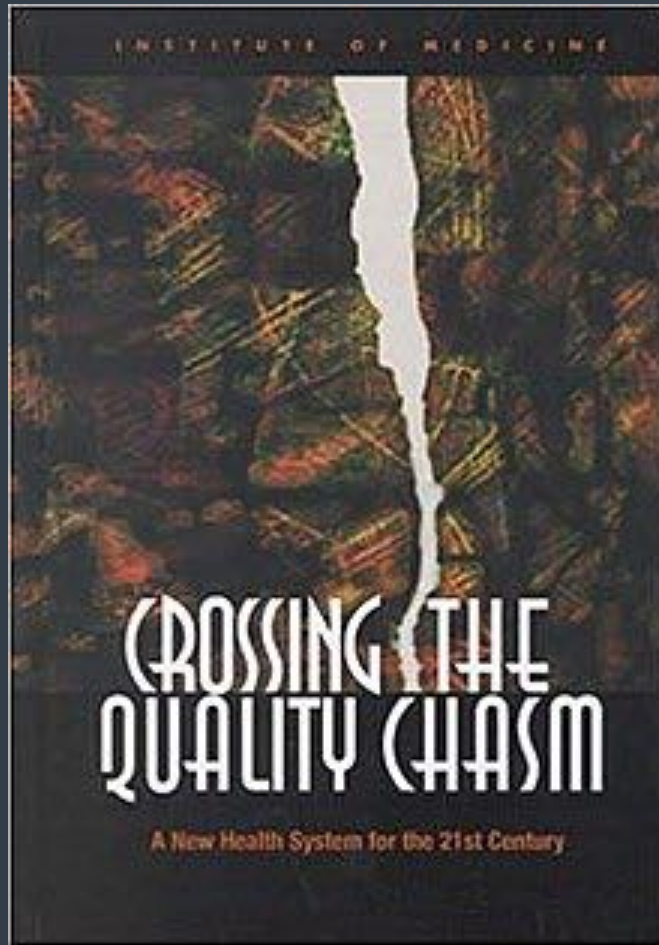


# HEALTH CARE PATIENT SAFETY

- IOM's recommendation of a 4 part plan:
  - Part 1 – Creation of “National Center for Patient Safety”
    - Recognition that health care was a decade behind other high-risk industries
  - Part 2 - Mandatory and voluntary reporting systems
    - Federal legislation would protect the confidentiality of certain information
    - Create environment where practitioners and health care organizations could learn and correct problems before serious harm occurs
  - Part 3 - Role of consumers, professionals, and accreditation groups
    - Pressure and incentives from public and private entities to drive fundamental change
  - Part 4 – Building a culture of safety
    - Create an environment in health care organizations where safety is top priority
    - Leadership needed from the “C” suite for accountability



# HEALTH CARE PATIENT SAFETY



- July 19, 2001
  - “Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century”
    - Described broader quality issues
    - Operationalizing a vision for the future of health systems
    - Defined 6 aims of care:
      - Safe
      - Effective
      - Patient centered
      - Timely
      - Efficient
      - Equitable

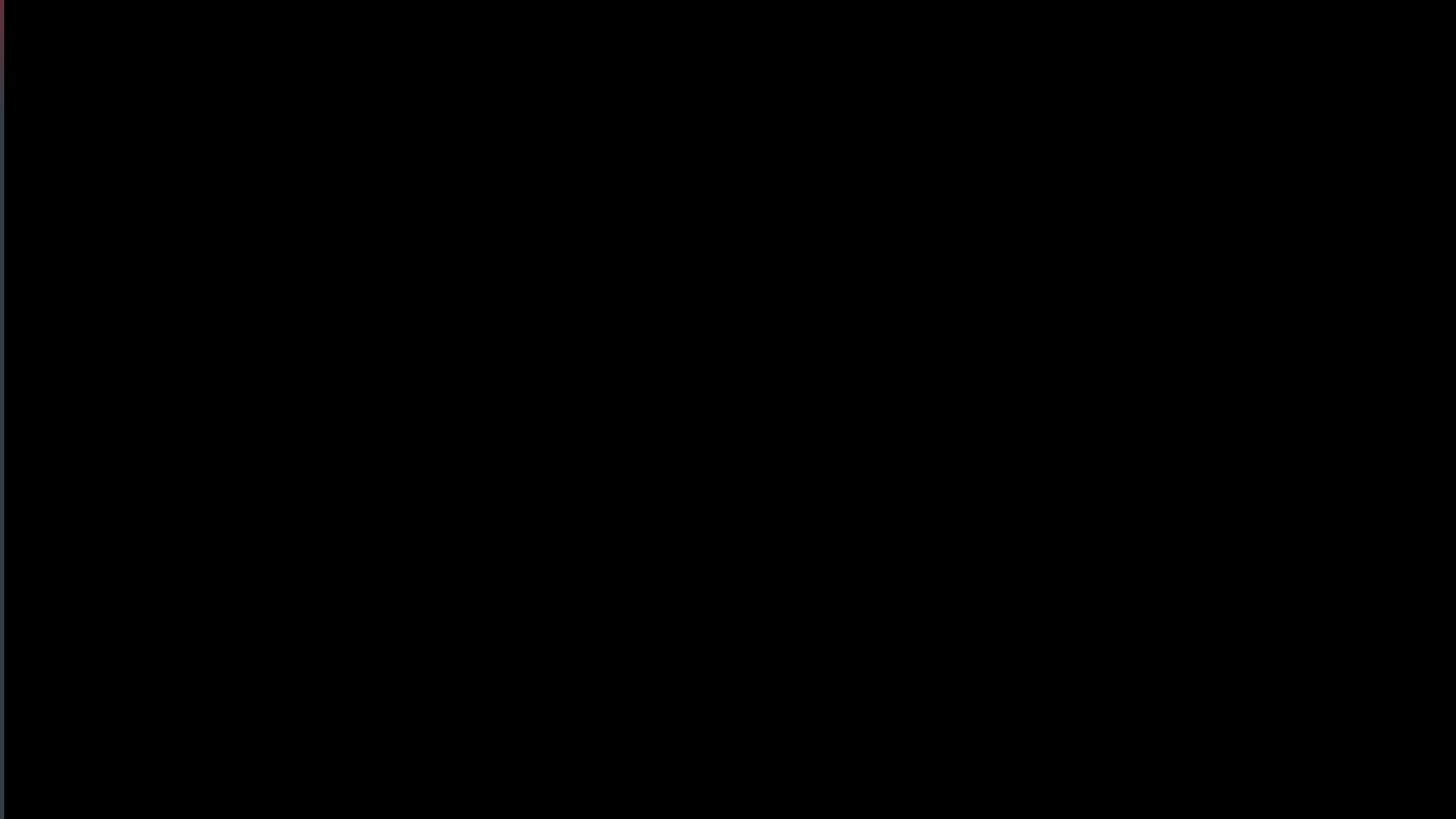
# HEALTH CARE PATIENT SAFETY

- Medical errors today:
  - Leading cause of morbidity and mortality
  - Human error accounts for 87% of all medical errors
  - 10-15% in Emergency Medicine care
  - 83% in Anesthesia with
    - Fixation errors as major contributing factor
      - Complexity of OR setting
      - Acuity of crisis situations
      - Psychophysiological variables unique to individuals and teams





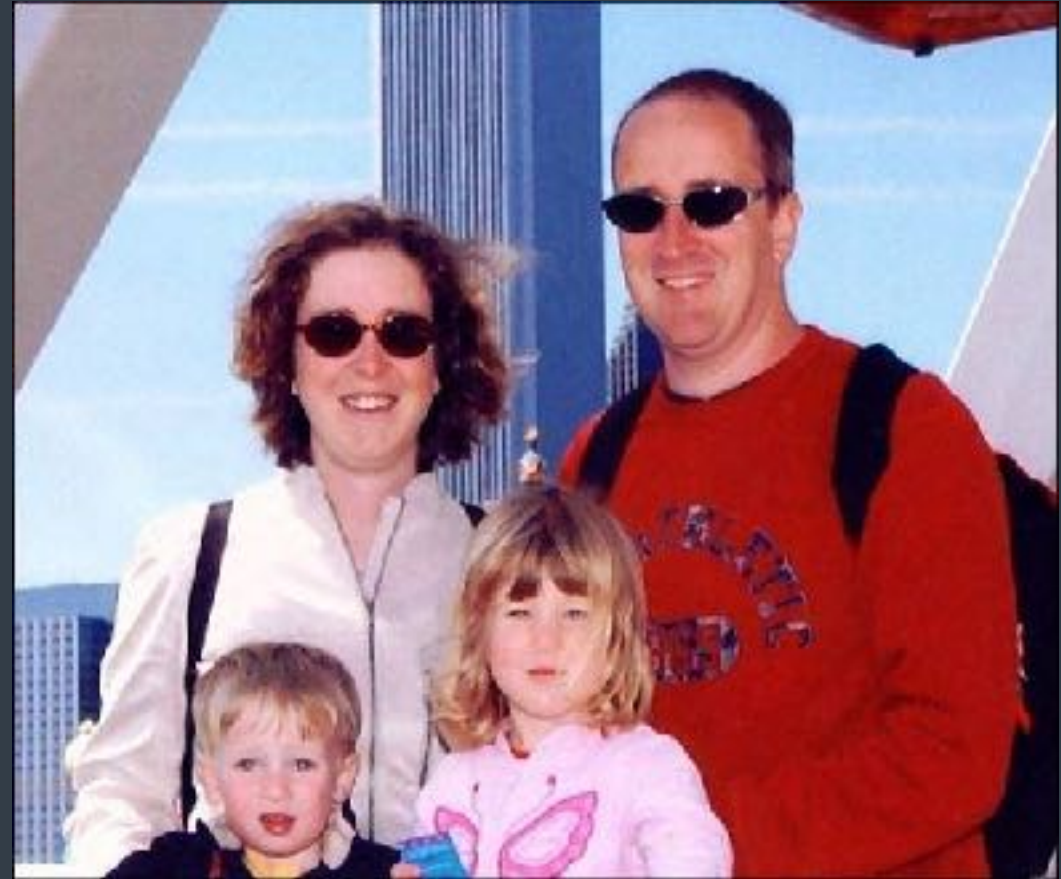




<https://www.youtube.com/watch?v=JzlvgtPl0f4>

# HEALTH CARE PATIENT SAFETY

- Mr. Bromiley took a stance of patient advocacy and action
  - Patient safety focused
  - Learning versus blame
  - Clinical Human Factors Group charity formation
- Lessons learned to teach to others:
  - Communication
  - Have a plan
  - Listen to all the team members
  - Take control



# HEALTH CARE PATIENT SAFETY

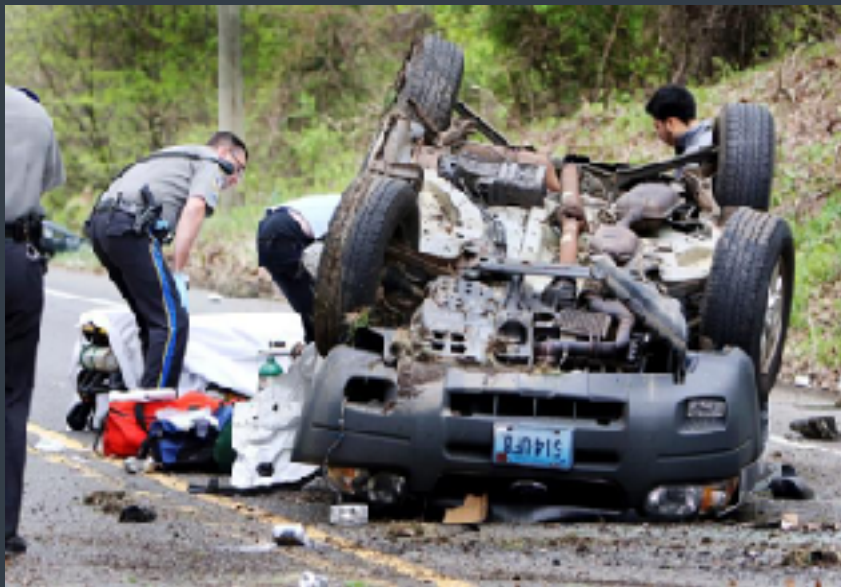
- “So, Suzy” you say.....”How does this apply to me in EMS?”
  - Expanded “anesthesia like” role in prehospital medicine
    - Airway management decision making for all populations
    - Drug assisted intubations (DAI) with no patient history
    - Patients are not NPO for extended period of time
  - Availability of additional trained personnel to assist
  - Variability of:
    - Equipment
    - Medication
    - Training
  - Environment that your role is carried out in
    - Chaotic
    - Distractions at every turn



**HI PARAMEDICS, I'M MAYHEM**

**I know when you eat, when you sleep, and what time  
you're supposed to go home in the morning. HAVE A GREAT SHIFT!**





# HEALTH CARE PATIENT SAFETY

- Drew Hughes EMS Case:
  - 13 year old male
  - Skateboard crash striking head on pavement
  - Transfer initiated to higher level of care due to lack of local resources
    - Request by father before patient arrival to ED
      - Employee of IT in the hospital
      - Retired State Trooper
    - Helicopter unable to fly due to weather
  - Intubated electively in ED
    - Self extubated once prior to departure

# HEALTH CARE PATIENT SAFETY

- “Woke up” again in ambulance pulling out ETT requiring reintubation
- Re-intubated with paralytic but reportedly no sedation
- Deterioration with no recheck of ETT placement despite request from referring MD
- Divert to closest hospital
- Quickly identified dislodged ETT







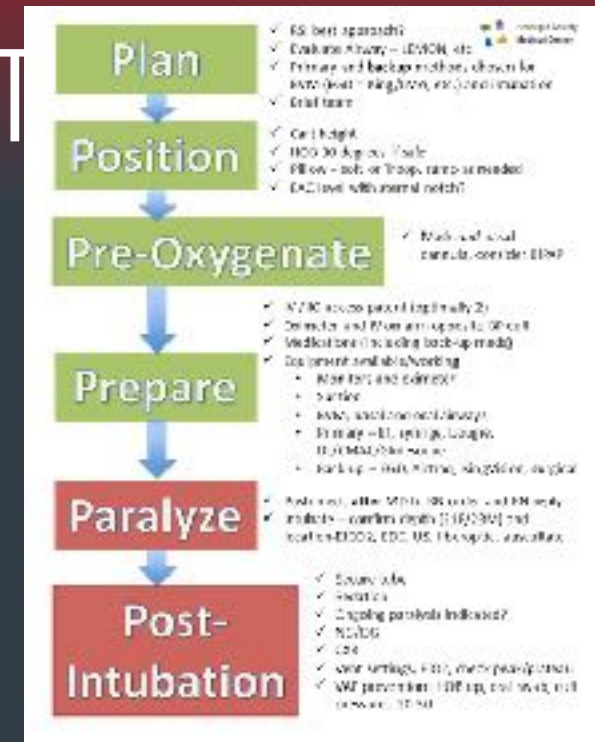
# HEALTH CARE PATIENT SAFETY

- “Do It For Drew” campaign
  - Crew Resource Management
  - Post intubation management and monitoring
  - Waveform capnography use and interpretation
  - How to deal with death of a patient

**First10EM**  
**POST INTUBATION CHECKLIST**

- Check Placement: Continuous ET/CO<sub>2</sub>
- Respect primary survey, vital signs
- Analgesic +/- sedation
- Elevate the head of the bed
- Set the ventilator
  - Bronchospasm? Metabolic acidosis?
- Adjust the ventilator
  - FiO<sub>2</sub> and PEEP
  - Send blood gas
  - Check peak and plateau pressure
  - Check waveforms
- Continue resuscitation (head to toe)
- Portable chest exam
- Other stuff
  - Cuff pressure
  - Humidification
  - Suction
  - O<sub>2</sub> tube
  - Mouth wash
  - Eye care

First10EM.com



	Actions
<b>M</b>	Adjust <b>Mask</b> to assure good seal on the face
<b>R</b>	<b>Reposition</b> airway by adjusting head to "sniffing" position
<b>S</b>	<b>Suction</b> mouth and nose of secretions, if present
<b>O</b>	<b>Open</b> mouth slightly and move jaw forward
<b>P</b>	Increase <b>Pressure</b> to achieve chest rise
<b>A</b>	Consider <b>Airway</b> alternative (endotracheal intubation or laryngeal mask airway)



# FIXATION ERRORS

“Fixation errors occur when the practitioner(s) concentrate solely upon a single aspect of a case to the detriment of other more relevant aspects of the case. These are well recognized in anesthesia practice and contribute significantly to morbidity and mortality.”

*No Simple Fix for Fixation Errors: Cognitive Processes and Their Clinical Application;*

E. Fioratous, R. Flin, R. Glavin 12/03/2009

# FIXATION ERRORS

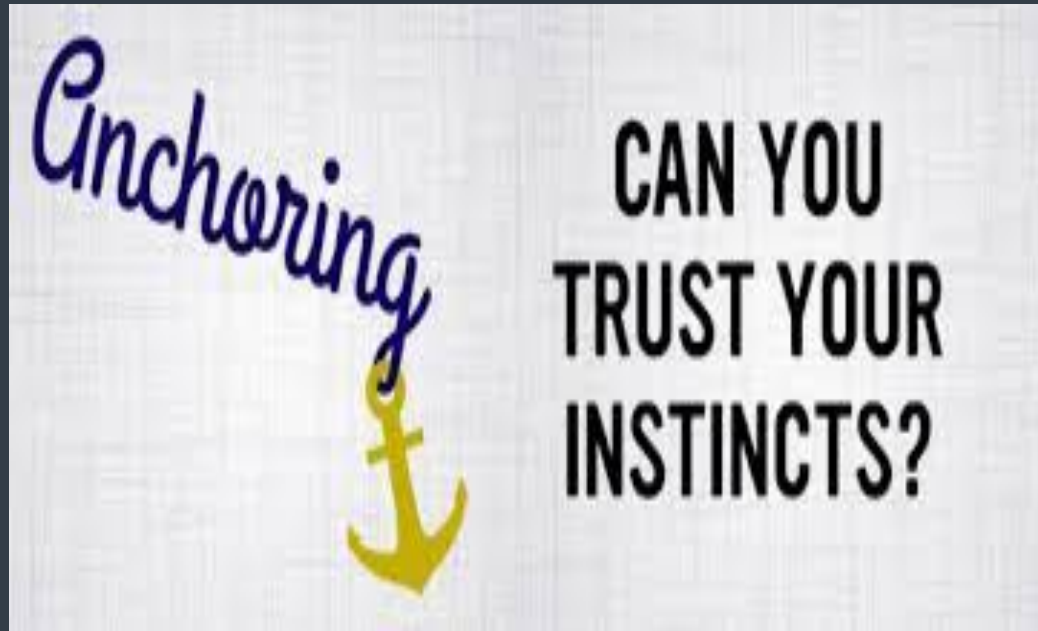
- Three different types identified:
  - “This and only this”
    - Only one diagnosis or solution to a problem is considered
    - Failure to revise situation as new evidence comes in
  - “Everything but this”
    - The correct diagnosis or solution is not considered
  - “Everything is OK”
    - When the problem is not acknowledged

# FIXATION ERRORS



- Fixation errors involve “anchoring” or “tunnel vision”
  - Considered human errors of insight
  - Research focused in field of cognitive psychology and aviation safety

# FIXATION ERRORS



- Experience and knowledge can work against us
  - Heuristic / experiential learning
  - Creates bias to new situation
    - “Anchoring” to a conclusion even when given information to contrary
  - Unhelpful reliance on past experience to detriment of current situation

# FIXATION ERRORS

- Strategies for correction:
  - Awareness most important to improve problem solving
  - Training for routine and non-routine scenarios
  - Provide a safe educational setting
    - Practitioners can explore their patterns of fixation
    - Increase awareness of the conditions that exacerbate them
    - Support exploration of how to mitigate them





# FIXATION ERRORS

- Strategies for correction:
  - Considerations during planning:
    - Rule out worst case scenarios
    - Accept that the first assumption may be wrong
    - Consider artifacts as the last explanation for a problem
    - Do not bias team members with a previous conclusion
    - Be open to hearing feedback



# CASE REVIEW





# CASE REVIEW

- Dispatched for scene flight to rural and somewhat remote area late May afternoon
  - Adult Trauma
  - Weight Unknown
  - Approximate GPS coordinates relayed
- Launch enroute to scene with an estimated flight time of 15”



# CASE REVIEW

- Updated information from Comm Center upon lift:
  - Cross bow to the head
  - Patient weight approximately 100kg
  - EMS on scene with updated GPS coordinates provided
  - Patient being intubated

# CASE REVIEW

## Proper Prior Planning Prevents Piss Poor Performance

- Discussion with partner of things to consider:
  - Scene safety?
  - Hunting / target practice mishap?
  - Interpersonal violence?
  - Relatively high velocity weapon
  - Distance from where it was deployed?
  - Entry point and most likely still impaled?



# CASE REVIEW

- Plan of care:
  - Bleeding control
  - Airway compromise
    - Who needs a tube?
    - Early apneic oxygenation
    - Plan A; B; C; D
  - Calculation of DAI medication
  - FFP / PRBC / TXA
  - 3% NS for ICP issues



# CASE REVIEW



- Radio contact made with LZ Command 7" out
  - LZ report given:
    - High grass field adjacent to house
    - Trees bordering property
    - Fencing
    - Poles and wires distance away
    - Mild-moderate winds
  - Patient update
    - Being moved from house to ambulance for intubation

# CASE REVIEW

- Arrival to scene with high recon
  - Multiple law enforcement vehicles
  - 2 ambulances
  - LOTS of people congregated near ambulance!!
  - Designated LZ and LZ Officer located
    - Safe distance away from activity
    - EMS / LE personnel with safety vests staged at fence opening to field
    - Obstacles identified
    - No animals nearby
    - LZ Officer confirms that scene is secure for landing

# CASE REVIEW



- Flight team escorted through fence by Fire / EMS personnel towards ambulance
- Multiple disheveled appearing people standing near ambulance crying hysterically “please help him!”
- Strong law enforcement presence
- One team member to back door of ambulance / partner goes to side



# CASE REVIEW

- My Mom always taught me to count my blessings 😊
- “Take your pulse....if you have a pulse, you can help”
- “Training is there for a reason....use it to your advantage”





**LET'S GET IT STARTED**

**IN HERE**

memegenerator.net

# CASE REVIEW

- Bleeding control
  - Lots of blood under head of patient, on cot, and on floor
  - Active “spurters” on outside of left face
  - Gross visual with no blood in airway
- Airway / breathing control
  - Effective 2 person BVM with good seal and noted chest rise
- Circulation
  - Skin appearance pale
  - Positive radial pulse
- Current VS on EMS monitor:
  - HR 118; Resp BVM assisted 14; O2 sat 94%; BP 118/84

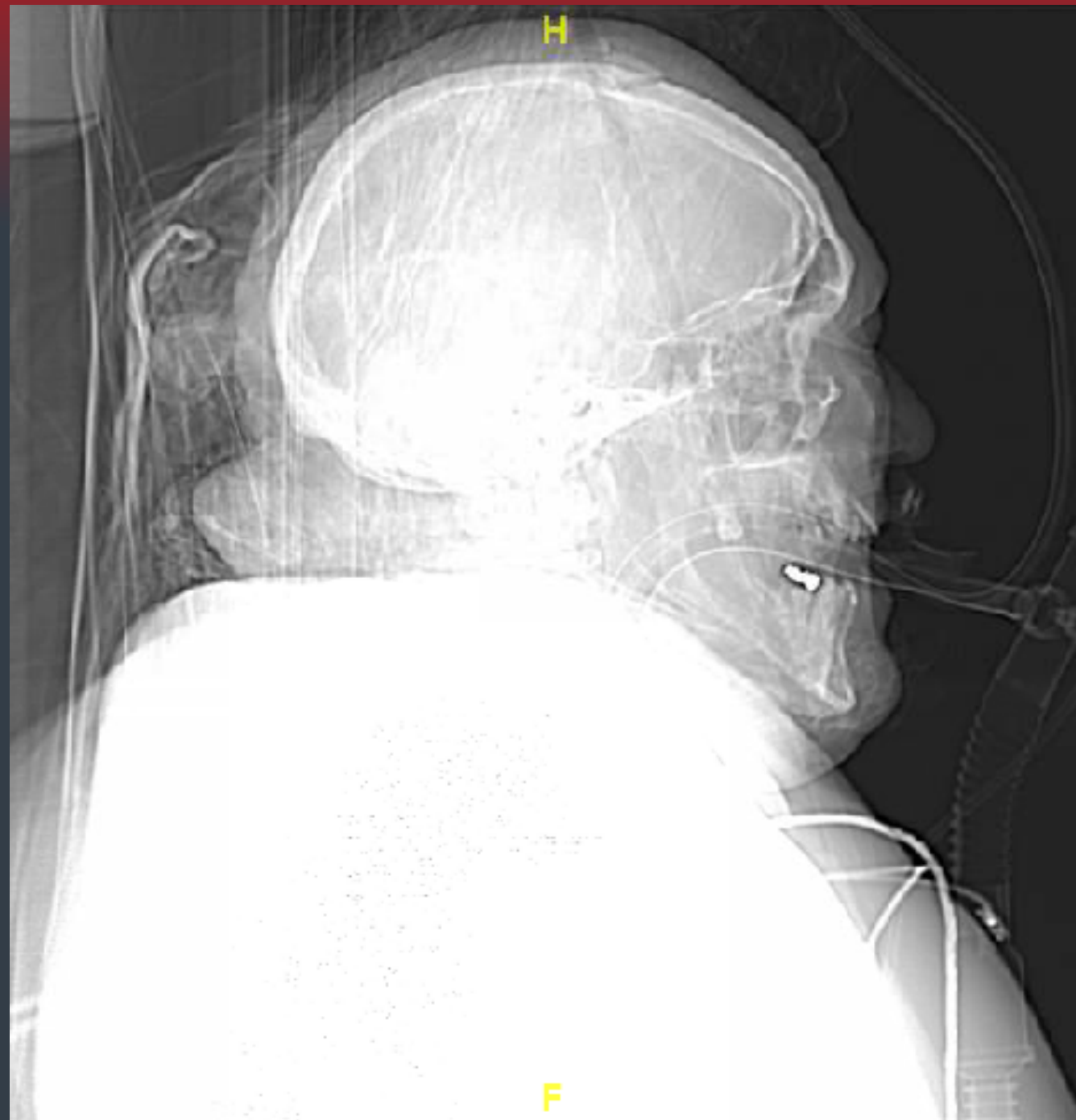
# CASE REVIEW

- Intubation versus straight to cric?
  - Initiate apneic oxygenation
  - One snaggle tooth
- Paralytic versus just sedation?
- Protection of c-spine?
- Protection of evidence?
- Any changes needed to the previously discussed plan with my partner?
- Does the entire team buy into the plan we've presented?

# CASE REVIEW

- Intubation checklist reviewed:
  - Suction - on and working at head
    - Unable to use “SALAD” technique
  - Oxygenation – apneic / BVM
  - Airway tools – GS Blade 4 / 7.5 ETT
  - Positioning – Patient / team
  - Pharmacology
    - Already received weight appropriate dose of Etomidate
    - Weight appropriate dose of Succ
    - No need for push dose pressor
    - Post intubation meds







# CASE REVIEW

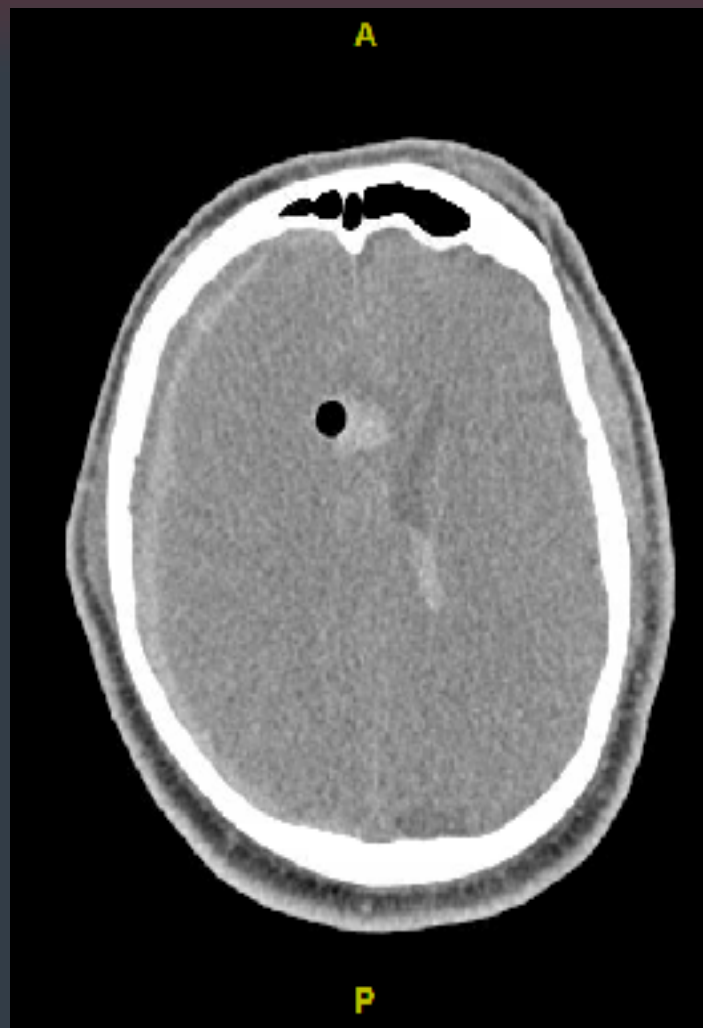
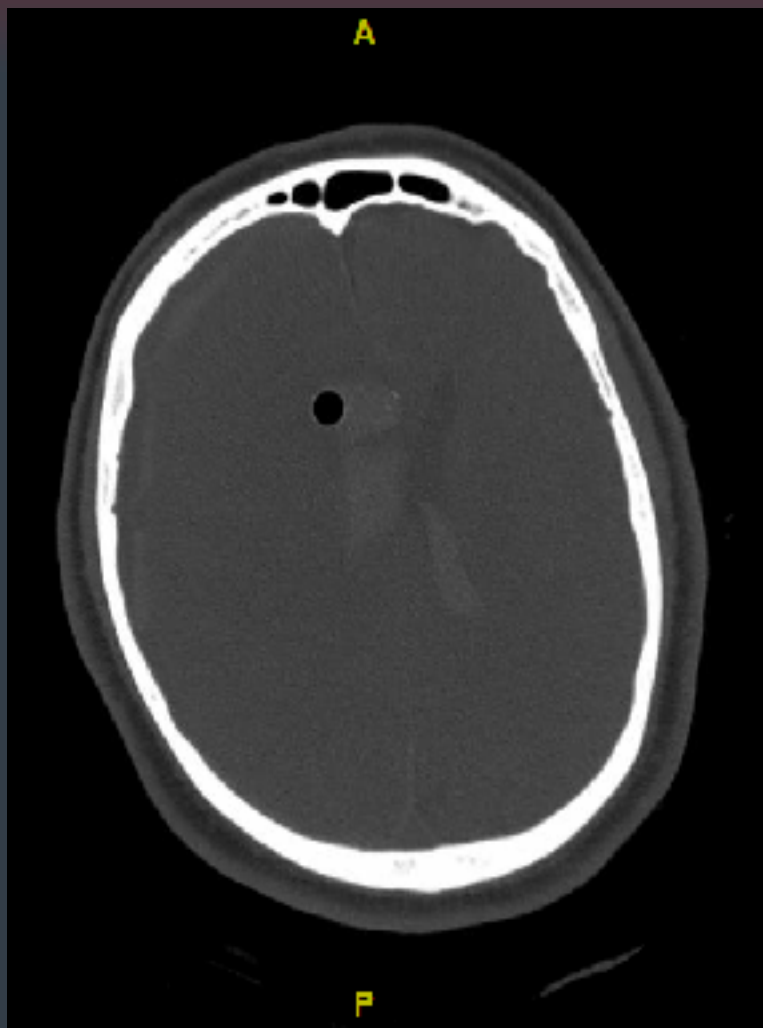
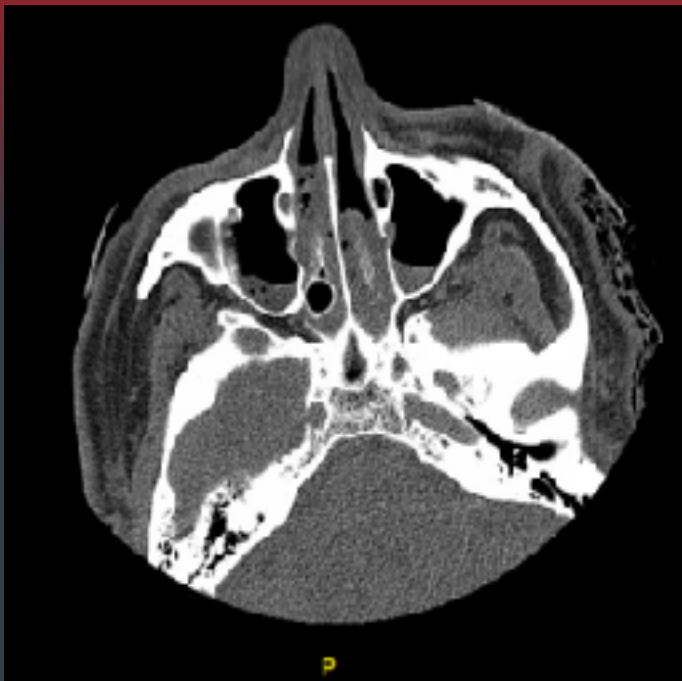
- Ready to move and load:
  - Ability to move the ambulance closer to the aircraft
  - Partner going ahead to aircraft:
    - Stretcher ready to receive patient
    - Ventilator on
    - Prime FFP on blood tubing
    - Warming blanket and fluid warmer
    - Ready to receive the patient inside
  - Every movement SLOW AND EASY!!
  - One person on the airway at all times



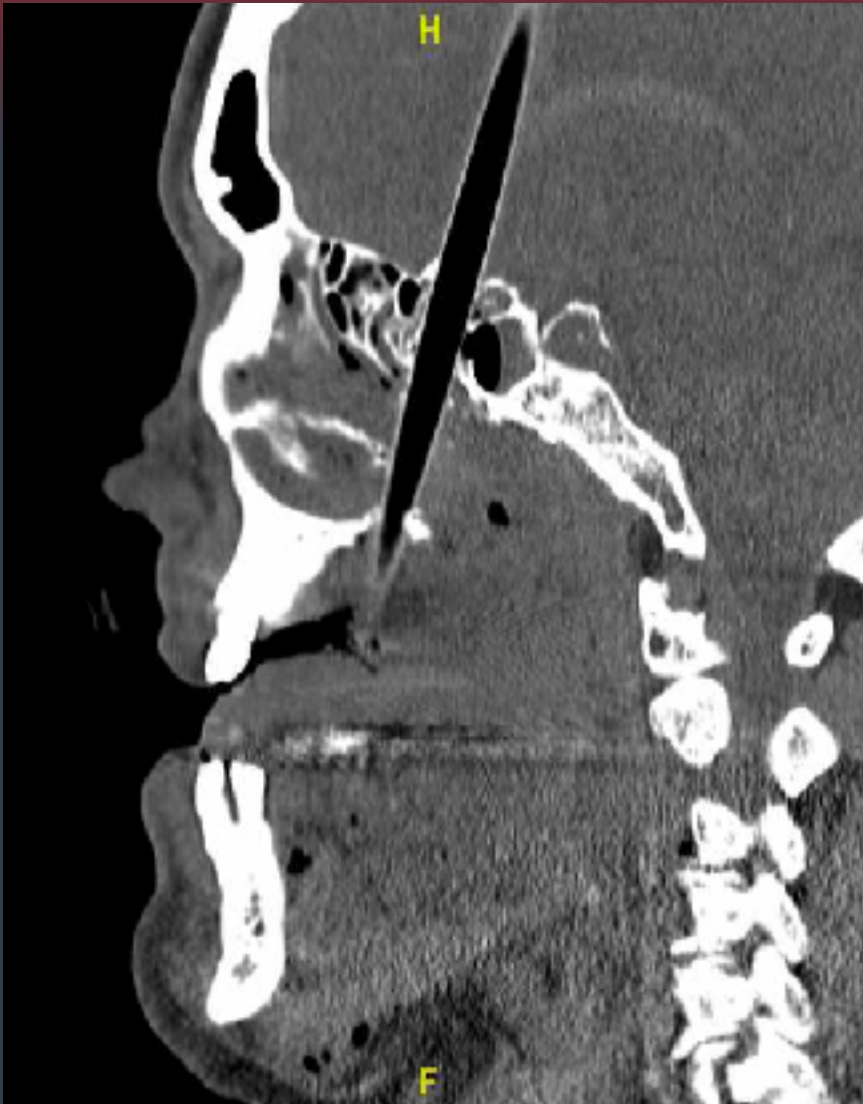
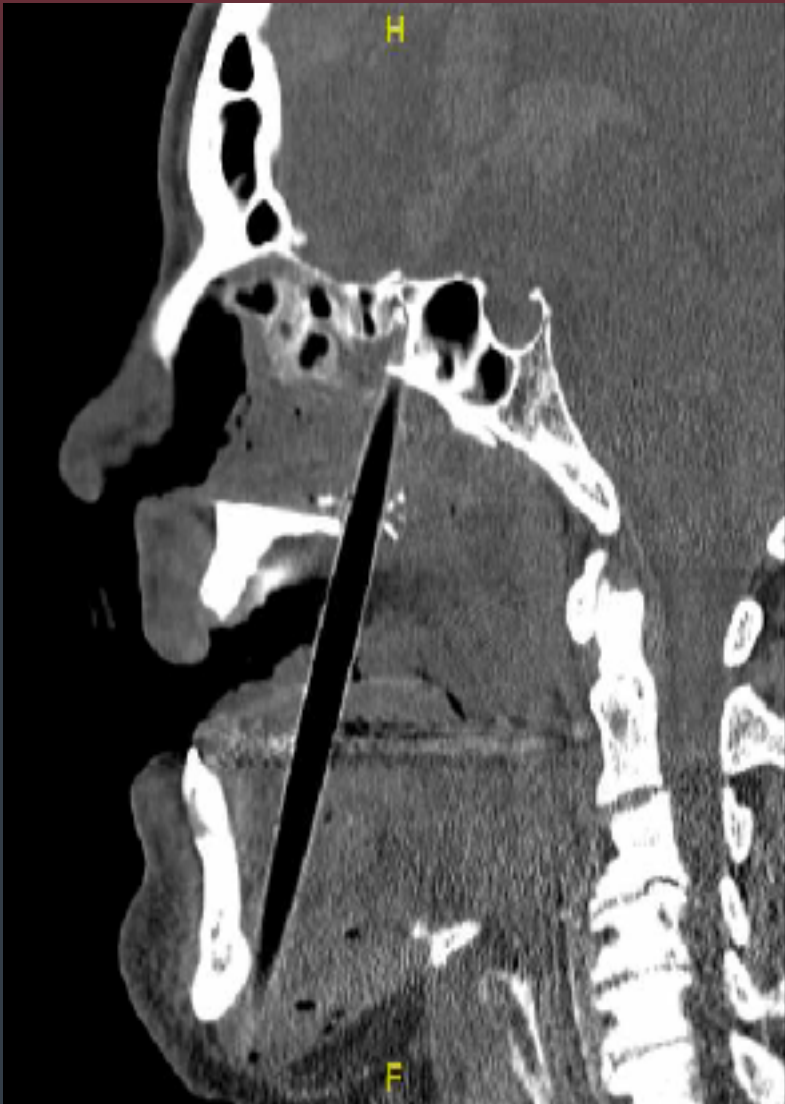
# CASE REVIEW



- Busy short flight:
  - Low altitude request
  - Pilot asked for relay from Comm Center to receiving upon lift
    - Full Trauma Activation
    - Crossbow to the head
    - Intubated
    - Never hypotensive
  - Crew positioning to avoid catching bow
  - 2<sup>nd</sup> IV initiated
    - Blood glucose check
  - One unit FFP
  - One unit PRBC
  - 3% NS after tank being filled











#### PREOPERATIVE DIAGNOSIS:

Penetrating wound (arrow) through oropharynx, hard palate, ethmoid sinuses, brain, and apex of the skull.

#### POSTOPERATIVE DIAGNOSIS:

Penetrating wound (arrow) through oropharynx, hard palate, ethmoid sinuses, brain, and apex of the skull.

#### PROCEDURE PERFORMED:

Midline mini craniectomy around the exit site of indwelling arrow for release of arrow shaft to allow extraction of arrow; interpretation of intraoperative CT scan of the head (x2) performed in conjunction with exploration and repair of injury to the palate and oropharynx (including tongue) by the Plastic Surgery Service.

- PREOPERATIVE DIAGNOSIS:

- Impalement with arrow through floor of mouth, hard palate, skull base, brain and skull.

- POSTOPERATIVE DIAGNOSES:

- 1. Impalement of arrow of through submental area, floor of mouth, tongue, right hard palate, right ethmoid sinuses through skull base, brain and through vertex of the skull and scalp.
- 2. Complex lacerations at submental area, 1 cm.
- 3. Complex laceration of tongue, 2 cm.
- 4. Complex laceration of hard palate mucosa, 1 cm.

- PROCEDURES PERFORMED:

- 1. Exploration, irrigation and debridement of submental wound, tongue wound, hard palate wound.
- 2. Intermediate repair of submental laceration, 1 cm; intermediate repair of tongue laceration, 2 cm; intermediate repair of hard palate mucosal defect, 1 cm.

- HOSPITAL COURSE:
- Admit HMC 5/21/18 – Discharged to Inpatient Rehab 6/5/18
- 64yo M presents with penetrating injury to the brain sustained IVH and right subdural s/p minicranotomy for removal of arrow 5/21, angiogram with slow flow to ACA A4 segment with no intervention required. Course c/b CSF leak s/p anterior cranial fossa repair by OTO 5/24. He was transferred to the floor 5/25 where he continued to progress with therapies and there were no concerns for recurrent CSF leak. His dysphagia improved and recently passed for a dysphagia mechanical with nectar thins diet. He had leukocytosis which was self resolving and c diff was negative. Psychiatry continued to follow him during his stay and he is currently not requiring a 1:1 sitter.
- On day of discharge patient reporting left arm tingling which he reports has happened in the past after a previous MVC. Recommend continue to work with therapies, CT c spine on admission did not show any acute processes.
- CONDITION:
- Good
- DISPOSITION:
- Other Facility: Harborview Medical Center Inpatient Rehab\par Seattle, WA

# FIXATION ERRORS

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# THANKS FOR ALL YOU DO!!!!

