Case 1: Scalp Laceration

6 y/o frightened boy presents with a scalp laceration after falling against a table corner edge.

How do you measure the length of the wound?

* EP’s are poor at estimating wound length.¹
* Use your “handy ruler” or stethoscope.

Case 1: Scalp Laceration

How do you minimize missing a 2nd laceration?

1. LED flashlight ($8-30)
   - Durable
   - Rare battery changes
   - Super bright
2. Manual palpation of the scalp

Good lighting is the key!

How would you close the scalp laceration?

1. Pediatric scalp lac: 2 staple guns

Contraindications to the HAT trick:
- Laceration >10 cm long
- Grossly contaminated wounds
- Active bleeding from the laceration
- Significant wound tension
- Hair strands <3 cm long

2. Hair Apposition Technique: The HAT trick
   - Uses opposing hair strands and tissue adhesive
   - One full 360° revolution twist of hair
   - Apply adhesive at twisting point
   - Repeat this along length of wound
   - Do NOT over-twist the hair.
   - Do NOT tie a knot.
   - Good for less reliable patients

1. Ong et al, Annals of EM, 2005
Case 2: Hand & Wrist Injury

30 y/o pedestrian vs auto presents with multiple abrasions and...

1. Embedded gravel in her right palm
2. Right index finger laceration
3. Right 2nd metacarpal fracture
4. Left distal radius fracture

How would you anesthetize the palm for copious irrigation and gravel removal?

- Median nerve block
- Regional wrist blocks

Advantages over traditional wrist block:
- Reduced risk for compartment syndrome
- Direct visualization
- Medication injection away from injury site

Forearm Ultrasound-guided Nerve (FUN) blocks
- U/S-guided nerve block of radial, ulnar, and median N
- Inject at level of the mid-forearm
- Nerves = hyperechoic

Advantages over traditional wrist block:
- Reduced risk for compartment syndrome
- Direct visualization
- Medication injection away from injury site

Case 2: Hand & Wrist Injury

How would you anesthetize the palm for copious irrigation and gravel removal?

Ultrasound of needle instilling anesthetic near median nerve (* = anesthetic)

Case 2: Hand & Wrist Injury

How would you stop the constant oozing of the right index finger for suturing?

Hemostasis in finger lacerations: Make a glove “ring”.
* Proper wound visualization
* Transfer glove “ring” from yourself to patient’s finger.

Case 2: Hand & Wrist Injury

How would you bandage the finger laceration?

Finger applicator
Band-netting
Case 2: Hand & Wrist Injury

How would you bandage the finger laceration?

“The Digi-Spec”
- Wrap band-netting around finger using a pelvic speculum

How would you splint the 2nd metacarpal fracture?

Traditional: Volar wrist splint

Trick of Trade: Radial gutter splint

How would you splint the distal radius fracture?

Traditional: Sugar tong forearm splint
Case 2: Hand & Wrist Injury

How would you splint the distal radius fracture?

Trick of Trade:
Reverse sugar tong splint

Case 3: Traumatic Hip Pain

80 y/o man s/p mechanical fall down stairs c/o R hip pain and minimally able to bear weight on his right leg.

* Up to 9% of femoral neck fxs have normal plain films.
* Complications from delayed dx:
  - Avascular necrosis
  - Nonunion
  - Further displacement of fx
* Next imaging = MRI (100% sensitivity)
* OK alternative = CT

Case 3: Traumatic Hip Pain

What non-invasive maneuver can you do to raise your pretest probability for an occult femoral neck fracture?

Trick of the Trade: Hip Auscultation Test

* Bone conducts sound waves well.
* Diminution of percussion sound conduction from the injured side suggests a fracture.
* Result: NPV 75%, PPV 98% ¹
* False positives
  - Severe OA of the hip or knee
  - Hardware in the hip, femur, or knee

¹. Tru et al, Singapore Med J, 2002

Case 4: Agitation and Back Pain

A 30 y/o woman BIBA for bizarre behavior at a storefront. She arrives agitated and yelling, requiring several officers to keep her on the gurney.

* Dilated pupils (7 mm)
* HR 140 bpm
* Hx of cocaine and IV heroin use

You notice that she is bleeding from an occipital wound.
Case 4: Agitation and Back Pain

You decide that chemical sedation is needed for a head CT. What medication(s) do you use? She has no IV.

- Traditional regimen = HAC (halol, ativan, cogentin)
- Trick of Trade: midazolam 5 mg IM
  - Midazolam: Most consistently absorbed IM benzodiazepine
  - IM midazolam has a quicker onset + offset than IM haloperidol or IM ativan alone.

<table>
<thead>
<tr>
<th></th>
<th>Time to onset</th>
<th>Time to arousal</th>
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</thead>
<tbody>
<tr>
<td>Lorazepam (2 mg IM)</td>
<td>32.2 min</td>
<td>217.2 min</td>
</tr>
<tr>
<td>Haloperidol (5 mg IM)</td>
<td>28.3 min</td>
<td>126.5 min</td>
</tr>
<tr>
<td>Midazolam (5 mg IM)</td>
<td>18.3 min</td>
<td>81.9 min</td>
</tr>
</tbody>
</table>

1. Nobey et al, Acad EM. 2004

Patient update: After a negative head CT, she awakes from her sedation and wants her LBP x 2 wks evaluated.

- TTP all along T and L spine

She then curls up into a fetal position and refuses to answer any further questions.

What maneuvers could reduce your suspicion for a red-flag back pain diagnosis – spinal epidural abscess?

**Waddell sign #1: Axial loading of scalp**

- With patient in an upright position, apply downwards pressure on top of head.
- Patient should NOT experience LBP.

**“Green flags” of back pain**
Case 4: Agitation and Back Pain

What maneuvers could reduce your suspicion for a red-flag back pain diagnosis -- spinal epidural abscess?

**Waddell sign #2: Distracted SLR Maneuver**

“Green flags” of back pain

**SLR maneuver**

**Distracted SLR maneuver**

**Hoover Test:** Suboptimal effort in hip flexion strength test

**Visual miscues in hand sensory exam**

**Waddell sign #3: Simulated rotation**

Rotating shoulders and pelvis in unison should not cause back pain.

“Green flags” of back pain
**Case 4: Agitation and Back Pain**

What maneuvers could **RAISE** your suspicion for a red-flag back pain diagnosis – spinal epidural abscess?

- Spinal percussion tenderness

**Case 5: Ocular Injury**

50 y/o man s/p altercation presents with eye pain from pepper spray by the police.

**Case 5: Ocular Injury**

The patient is extremely sensitive to application of anesthetic eyedrops. How can you apply them more gently?

- "Blink it in"
  - Tilt patient’s face towards the ceiling with eyes closed.
  - Apply drops into medial canthus (circle).
  - Have patient then "blink" the drops in.

**Case 5: Ocular Injury**

You try to apply Morgan lens for ocular irrigation, but the patient pulls them out. How can you irrigate the eyes?

- Nasal cannula irrigation
**Case 5: Ocular Injury**

After irrigation, soft tissue swelling of the eyelid makes it difficult to get an unobstructed view. You do not have an eyelid retractor. How do you retract the eyelids?

- **Paperclip retraction**

Examine traumatized orbit early before soft tissue swelling worsens.

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**Case 6: Vascular Access**

80 y/o woman presents in PEA arrest and the nurses are unable to establish vascular access. You begin prepping for a femoral line.

**V-Technique**
- Use external landmarks
- Failure rate in pulseless pts = 23%
- Femoral vein is at "V" of hand

Case 6: Vascular Access

Update: You successfully place the femoral central line!
* The patient is stabilized.
* You decide to change the line over to a subclavian central line.
* Fact: Most common malpositioning of subclavian catheter is into ipsilateral IJ vein (up to 10% of time)

How can you minimize the chances of your subclavian line tip ending up in the ipsilateral IJ vein?

* "Finger in Fossa" Technique
  * Occlusion of IJ with finger
  * Anesthesia study: Incidence of malpositioned tip in IJ: 6% (control) vs 0% (test case)
  * Interestingly: Patients with malpositioned catheter in IJ had ear pain or tickling throat sensation.

1. Ambati et al, Anesthesia, 2002

Case 7: Tissue Adhesives

A 25 y/o woman sustains a clean, shallow laceration very near her upper eyelid.

How could you safely close the wound with a tissue adhesive?

1. Cut a small circle out of a transparent tegaderm adhesive.
Case 7: Tissue Adhesives

How could you safely close the wound with a tissue adhesive?

1. Cut a small circle out of a transparent tegaderm tape.
2. Apply tegaderm to skin around the wound and apply tissue adhesive.

Case 8: Peritonsillar Abscess

23 y/o male presents with a sore throat and right-sided peritonsillar swelling.

Is this an abscess or cellulitis?

Use ultrasonography to help characterize the swelling.

- Use an intracavitary transducer.
- Abscesses are encapsulated hypoechoic (dark) structures
- Carotid artery can also be localized

Transverse view of peritonsillar space
Case 8: Peritonsillar Abscess

How would you visualize the abscess during needle aspiration?

Use a laryngoscope with a size 4 Macintosh (curved) blade.
- Obstructs view less than a tongue blade plus penlight
- Provides focused lighting

Case 8: Peritonsillar Abscess

How would you perform the needle aspiration?

Use a spinal needle with the sheath trimmed such that 1.5 cm of the needle is exposed.
- Longer needle keeps syringe outside of the mouth
- Reduces risk of too a deep puncture

Case 9: Odors in the ED

A 40 y/o homeless man is BiBA for being “found down”. His feet exude a malodorous smell throughout the ED. You also note a 10 cm humeral abscess, which will need I+D.

“Toxic Sock Syndrome”
- Trapped perspiration/bacteria within socks + poor foot hygiene
- Moist, warm environment: Bacteria proliferate and produce foul-smelling isovaleric acid.

Case 9: Odors in the ED

How do you minimize the smell of “toxic sock syndrome”?

Antacid booties:
- The alkaline antacid solution neutralizes the acidic environment and thus reduces the odor.
**Case 9: Odors in the ED**

How can you minimize the purulent smell during the I+D?

Collect pus in suction canister:
* In large abscesses, directly insert Yankauer suction catheter into abscess cavity to evacuate pus.

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**Summary**

Case-based scenarios
- Wound care
- Orthopedics
- Sedation
- Ocular injury
- Back pain
- Vascular access
- Tissue adhesives
- Peritonsillar abscess
- Odors in the ED

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Questions / Comments?