Need to Know X-Ray Findings

Tung Nguyen, DO
ACOFP FULL DISCLOSURE FOR CME ACTIVITIES

Please check where applicable and sign below. Provide additional pages as necessary.

Name of CME Activity: ACOFP Intensive Update & Board Review in Family Medicine
Dates and Location of CME Activity: August 24-26, 2018, Loews Chicago O'Hare Hotel, Rosemont, IL, United States

Name of Faculty/Moderator: Tung Nguyen, DO

DISCLOSURE OF FINANCIAL RELATIONSHIPS WITHIN 12 MONTHS OF DATE OF THIS FORM

A. Neither I nor any member of my immediate family has a financial relationship or interest with any proprietary entity producing health care goods or services.

B. I have, or an immediate family member has, a financial relationship or interest with a proprietary entity producing health care goods or services. Please check the relationship(s) that applies.

- Research Grants
- Stock/Bond Holdings (excluding mutual funds)
- Speakers' Bureaus*
- Employment
- Ownership
- Partnership
- Consultant for Fee
- Others, please list:

Please indicate the name(s) of the organization(s) with which you have a financial relationship or interest, and the specific clinical area(s) that correspond to the relationship(s). If more than four relationships, please list on separate piece of paper:

<table>
<thead>
<tr>
<th>Organization With Which Relationship Exists</th>
<th>Clinical Area Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

*If you checked “Speakers’ Bureaus” in item B, please continue:

- Did you participate in company-provided speaker training related to your proposed topic?
- Did you travel to participate in this training?
- Did the company provide you with slides of the presentation in which you were trained as a speaker?
- Did the company pay the travel/lodging/other expenses?
- Did you receive an honorarium or consulting fee for participating in this training?
- Have you received any other type of compensation from the company? Please specify:
- When serving as faculty for ACOFP, will you use slides provided by a proprietary entity for your presentation and/or lecture handout materials?
- Will your topic involve information or data obtained from commercial speaker training?

Yes: ☑ No:

DISCLOSURE OF UNLABELED/INVESTIGATIONAL USES OF PRODUCTS

A. The content of my material(s)/presentation(s) in this CME activity will not include discussion of unapproved or investigational uses of products or devices.

B. The content of my material(s)/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated below:

I have read the ACOFP policy on full disclosure. If I have indicated a financial relationship or interest, I understand that this information will be reviewed to determine whether a conflict of interest may exist, and I may be asked to provide additional information. I understand that failure or refusal to disclose, false disclosure, or inability to resolve conflicts will require the ACOFP to identify a replacement.

Signature: __________________________ Date: 7/15/18
X-RAY REVIEW OF COMMON DISEASES

Tung Nguyen DO
Faculty at Jefferson Health
Assistant Clinical Professor Indiana University Health
Family Medicine/Emergency Medicine
Critical Care Medicine

DISCLOSURE

- I have no financial relationship or interest in any proprietary entity producing health care goods or services.

- The content of my material will not include discussion of unapproved or investigational uses of products or devices.
NORMAL CHEST XRAY

TERMINOLOGY

T103a
Cephalization of pulmonary vasculature
Peribronchial cuffing
Perihilar haze
Kerley A lines
Kerley B lines
Pleural effusion
CASE 1

- 3 y.o male coming to the FP office brought by mother due to a persistent cough.
- Rhinorrhea, non productive cough, sore throat.
- Low grade fever.
- Worse at night.
- Inspiratory stridor.

https://www.flickr.com/photos/anjanettew/5488872249
CROUP

- 6 months to 3 years
- Fall/winter
- Parainfluenza
- Barking seal like cough/INSPIRATORY STRIDOR
- Low grade fever
- **Subglottic narrowing** on CXR
  - “steeple sign”
- Tx: steroid, racemic epinephrine, hydration,
  ?cool mist
- Severe cases: O2 support, heliox


CASE 2

- 2 y.o male with difficulty breathing today
- 1-2 days hx of sore throat, cough, congestion, fever 102F
- Drooling, not eating/drinking/talking
- “all of a sudden he looks terrible”

Tripod sign

- Pt appears anxious
- Leans forward with support of both forearms
- Extends neck in an attempt to maintain an open airway

https://s-media-cache-ak0.pinimg.com/236x/a9/94/88/a9948822f6f1364d0af5b3de1a0400.jpg
EPIGLOTTITIS

- 2-5 yo
- Strept and staph species
  - Used to be h. flu
- RAPID onset, high fever
- Drooling, sore throat, muffled voice
- “thumbprint” sign
- Tx: secure airway, abx, cultures
- Airway EMERGENCY

http://www.patientcareonline.com/sites/default/files/cl/1775596.png
**CASE 3.5**

- 12 months old F c cough, fever, congestion x 2 days
- Wheezing intermittently
- Difficulty breathing this morning with cough
- Peribronchial cuffing or thickening on cxr
- Tx: supportive. Admit if <12 months old concern for apnea
THE DIFFERENCE

- Signs of respiratory distress in pediatric
  - Tachypnea, tachycardia
  - Nasal flaring, grunting
  - Muscle retractions: costal
  - Tripod position
  - Stridor with toxic appearing
CASE 3

- 75 y.o F c/o neck pain
- fall down 3 steps
- midline discomfort at around C2
- No focal neurologic deficits

HANGMAN’S FRACTURE

https://upload.wikimedia.org/wikipedia/commons/a/a5/Hangman%27s_fracture.JPG
**Hangman’s Fracture**

- **Hyperextension**, high velocity
- Lateral view xr
- Anterolithiasis of C2 on C3
- Fractures b/l pars interarticularis
- **Unstable** Cervical Fracture

[Image of Hangman's Fracture]


---

**Case 4**

- 19 y.o M dove into a pool and struck the top portion of his head onto the pool floor.
- Headache, upper neck tenderness.
- Strange sensation of inability to detect between temperatures and pain.

[Image of Case 4]

https://c1.staticflickr.com/3/2464/3689122491_70f8c481d_b.jpg
JEFFERSON FRACTURE
**JEFFERSON FRACTURE**

Compression fracture of ring C1.

Displacement of the lateral masses of vertebrae C1 beyond the margins of the body of C2 vertebrae.

Stable or unstable?


---

**CASE 5**

- 16 y.o M with right shoulder pain after being tackled at football practice.
- Right shoulder appears shortened and drooping.
- Tenting of skin on affected side.
- No respiratory distress.


http://www.bristolshoulderandelbowsurgery.co.uk/shoulder-problems/acj-dislocation/files/page36-acromioclavicular-joint-dislocation-edited.jpg
CLAVICLE FRACTURE

- Allman Classification
  - Group I: Middle Third
  - Group II: Distal Third
  - Group III: Proximal Third

- Always be concerned about a pneumothorax.

CASE 6

- 18 month old M with complaint of right arm pain after falling out of bed.
- With his mother
- Significant pain and deformity of right mid humerus.
- Bruises noted to all extremities.

https://www.flickr.com/photos/patdavid/5802238803
Fractures in pediatrics account for 8-15% of all injuries.

Abuse is 12-20% of fractures in infants and toddlers.

80% of child abuse fractures occur in children < 18 months.
CASE 7

- 13 y.o F falls while playing field hockey at school.
- Fell onto her elbow.
- Ability to flex and extend but with pain.
- Mild/Moderate swelling.

https://pixabay.com/p-1537470/?no_redirect

https://upload.wikimedia.org/wikipedia/commons/b/bc/Sailsign.PNG
OCCULT SUPRACONDYLAR FRACTURE

- Sail Sign
- Posterior Fat Pad

- Fx of distal humerus
  - Rare in adults, common in children
  - Can lead to immobility if undiagnosed
  - Fall on HYPEREXTENDED elbow.

[Image: Sail Sign]

https://upload.wikimedia.org/wikipedia/commons/8/89/AnteriorandPSailSign.png

OCCULT SUPRACONDYLAR FRACTURE

- Sail Sign
- Posterior Fat Pad

- Fx of distal humerus
  - Rare in adults, common in children
  - Can lead to immobility if undiagnosed
  - Fall on HYPEREXTENDED elbow.

[Image: Fracture]

https://upload.wikimedia.org/wikipedia/commons/0/09/Supracondylarfrac.png
**Occult Supracondylar Fracture**

- Sail Sign
- Posterior Fat Pad

- Fx of distal humerus
  - Rare in adults, common in children
  - Can lead to immobility if undiagnosed
  - Fall on HYPEREXTENDED elbow.

[Image: https://upload.wikimedia.org/wikipedia/commons/0/09/Supracondylar_frac.png]

**Supracondylar Fractures**

- 90% under age 10 yo
- Peak age 5-7 yo
- Hyper-extended elbow injury
- Fat pads
- Anterior humeral line
- Depending on type:
  - Surgery vs cast
- 3 complications:
  - Volkmann’s contracture, ulnar nerve damage, malunion

[Image: https://radiopaedia.org/cases/normal-alignment-of-distal-humerus-and-capitellum]

Case courtesy of A. Prof Frank Galliard; Radiopaedia.org
CASE 8

- 20 year old female complains of abdominal pain and back pain that she rates as 10/10 upon presentation to the ED. She was transferred to the ED after being injured in a motor vehicle crash. She is on a backboard and wearing a cervical collar.

http://www.freestockphotos.biz/stockphoto/15269

https://commons.wikimedia.org/wiki/File:Change_Fracture_of_T10_and_T9_from_MVC.jpg
CHANCE FRACTURE

- flexion-extension injuries of the spine that involve all three spinal columns
- “Seatbelt fractures”
- unstable
- associated with intra-abdominal organ injuries
- most commonly in thoracolumbar spine
- tx usually surgical (or cast)

https://www.emergencymedicinekenya.org/chance-frac
Courtesy of Emergency Medicine Kenya Foundation

CASE 9

- 82 yo female from nursing home with change in mental status and fever.
- Poor inspiratory effort.
- History of dementia.

PNEUMONIA

https://commons.wikimedia.org/wiki/File:Lobaerpneumonie.jpg

https://commons.wikimedia.org/wiki/File:Lobaerpneumonie.jpg
**CASE 10**

23 yo male falls while skiing in the Poconos
No head injury.
Complains of isolated hand pain.

[Image](https://pixabay.com/p-498473/?no_redirect)

[Image](http://learningradiology.com/notes/bonenotes/gamekeeperspage.htm)
GAMEKEEPER’S THUMB

▪ http://radiopaedia.org/articles/gamekeeper-thumb
▪ Aka “Skier Thumb”
▪ Injury to the ulnar collateral ligament (UCL) at the first MCP joint
▪ Not always associated with a fracture but if there is a fracture will see an avulsion fracture on the ulnar side of the proximal phalanx
▪ Hyperextension of the thumb
▪ Management: thumb spica splint
▪ Refer to ortho.
  ▪ WHY?
    ▪ Complete ruptures get internal fixation
    ▪ Incomplete ruptures get 4 weeks of immobilization

https://www.physio-pedia.com/Skier%27s_thumb
CASE 11

- 19 yo male is skateboarding when he falls onto an outstretched hand causing pain at his wrist.
- No other injuries

https://en.wikipedia.org/wiki/Flip_trick

https://lifeinthefastlane.com/colles-4/
NAME OF FRACTURE?

- Need a hint?
  - Is this a Smith fx or a Colle's fx?
  - How do you know the difference?

COLLE'S FRACTURE

https://lifeinthefastlane.com/colles-4/
COLLE’S FRACTURE

- **Extrarticular** fracture of the distal radius
- **DORSAL** angulation
- Results from FOOSH
- **Most common type of distal radius fractures** and are seen in all age groups
- **Pearl**: can be associated with osteoporosis. This should prompt PCP’s to order a DXA scan in the applicable population
- **Management**: closed reduction, cast (may sometimes require ORIF depending on features)

SO WHAT IS SMITH’S FRACTURE?

- Distal radius fracture with **VOLAR** angulation
- “reverse colle’s fracture”
- Only 3% of all distal radius fractures
- Bimodal distribution
  - Young males
  - Elderly females

[Refer to the image for the specific content related to Smith’s fracture, available at: http://www.emergucate.com/2012/12/31/imaging-case-of-the-week-28/smiths-fracture-and-disi/]
COLLES VS SMITH'S

Colles Fracture of the end of the radius

Smith's Fracture of the end of the radius

http://www.pinestreetpt.com/library_wrist_41/

CASE 12

- 64 yo alcoholic female presents to the office after falling down a flight of steps and complains of left sided chest pain
- No other complaints

https://pixabay.com/p-99175/?no_redirect
Pneumothorax

https://commons.wikimedia.org/wiki/File:Pneu.jpg

https://commons.wikimedia.org/wiki/File:Pneu.jpg
**PNEUMOTHORAX**

- Presence of gas in the pleural space
- Traumatic vs spontaneous
- Radiographic features:
  - No lung markings beyond white line (visceral pleura)
  - Peripheral space is radiolucent
  - May see lung collapse
  - Subcutaneous air may be seen
  - If mediastinum is shifted → tension PTX
  - Deep sulcus sign

- Management: feature dependent
  - Chest tube
  - Management

**CASE 13**

29 yo female riding on the crowded train. Passengers began to become angry and the patient was subsequently pushed to the ground landing on her arm. She presents to the office one day later with significant shoulder pain and restriction in motion.

https://commons.wikimedia.org/wiki/File:Pneumothorax.gif_1.gif

https://www.flickr.com/photos/bike/2652863827
AC JOINT SEPARATION
AC JOINT SEPARATION

- AC joint space is normally less than 5 mm
- PEARL: can order “stress view” which helps if the separation is subtle
- Management: depends on grade
  - Monitor, surgery, RICE, sling

CASE 14

- 22 yo male in fist fight with another male at the local bar.
- Presents to office 2 days later with swollen and painful hand.
- Pain is most prominent on ulnar side of hand.

https://commons.wikimedia.org/wiki/File:NMBarScene.jpg
BOXER'S FRACTURE

Fracture of the **fifth metacarpal neck**

Management: usually surgical
CASE 15

- 20 yo volleyball player presents with knee pain for several weeks.
- No falls or other direct injury
- Pain worsens when she climbs stairs
**TRICK!**

- Normal Xray
- This is patellar tendonitis
  - Aka “jumper’s knee”
- TTP over patellar tendon
- Xrays normal
  - May show hyperostosis at upper and lower ends of patella
- Management: RICE, NSAIDs, quad-strengthening exercises/PT

https://commons.wikimedia.org/wiki/File:Knee_anatomy.jpg

---

**CASE 16**

- 17 yo male presents with foot pain after jumping off a high wall to escape the police officer who was chasing him.
- Pain is mostly on his heels.

https://c1.staticflickr.com/3/2294/2509348460_71fe795a73.jpg
CALCANEUS FRACTURE

- Severe axial load
- Bohler’s angle
- Management: posterior splint, non-weight bearing, orthopedic referral
- PEARL: must consider associated lumbar vertebrae fractures; high rate of compartment syndrome

http://eorif.com/AnkleFoot/AnkleFoot/calcaneus%20anat.html
CASE 17

- 24 year old ballet dancer is practicing for her upcoming show when she suddenly falls to the ground after inverting her foot.

- She complains of significant pain and swelling to the lateral aspect of her foot. She limps off the stage.

http://pixel.nymag.com/imgs/fashion/daily/2016/07/21/21-tiler-peck-nyc-ballet-solo.w710.h473.2x.jpg

https://radiopaedia.org/cases/pseudo-jones-fracture
Case contributed by Dr. Abhijit Datir
**PSEUDO-JONES FRACTURE**

- AVULSION fracture of the base of the 5th metatarsal (metatarsal styloid)
  - Peroneus brevis tendon avulsion injury
- very common
  - 90% of the fractures that occur at the base of the 5th metatarsal
- “tennis fracture”
- “dancer fracture”
- Tx: conservatively
  - (if intra-articular or large/displaced may require surgery)

<http://www.fprmed.com/Pages/Ortho/PSEUDO-JONES_FRACTURE.htm>

**WHAT ABOUT A JONES FRACTURE?**

- a fracture through the proximal portion of the 5th metatarsal
  - Not an avulsion injury
  - 1.5 to 3 cm distal to the proximal tuberosity at the metadiaphyseal junction
- extra-articular
- Prone to NON-union (30-50%)
- Healing time is > 2 months
- non weight-bearing cast for 6-8 weeks
- May require fixation and/or bone grafting

<http://kin480jlaverman.weebly.com/uploads/5/0/8/2/50828463/4628659_orig.jpg>
CASE 18

- 75 y.o M with complaint of nausea/vomiting and constipation.
- Hx of abdominal surgeries.
- Takes Percocet for history of low back pain.


http://img.medscapestatic.com/pi/meds/ckb/70/40370tn.jpg
SMALL BOWEL OBSTRUCTION

http://img.medscapestatic.com/pi/meds/ckb/70/40370tn.jpg

LARGE VS. SMALL BOWEL OBSTRUCTION

**Large Bowel**
- Peripheral
- Max diameter approx 8cm
- Colon with “bubbly” appearance
- Air fluid levels are large

**Small Bowel**
- Central
- Max diameter approx 5cm
- Many air fluid levels
- Air fluid levels are small
- Plicae circularis
  - Cross full width
THANK YOU

Christine Martino, D.O.
Aria Jefferson Health
Pennsylvania

IMAGES REFERENCES

- Case 1
  - https://www.flickr.com/photos/anjanettew/5458857332
  - https://commons.wikimedia.org/wiki/File:Croup_steeple_sign.jpg
  - https://s-media-cache-ak0.pinimg.com/564x/05/53/8f/05538fdcfae67591e221341e98a2f6c0.jpg

- Case 2
  - https://s-media-cache-ak0.pinimg.com/236x/a9/94/88/a9948822f6681364d0af5b3de1a0400.jpg
  - http://www.consultantlive.com/sites/default/files/cl/1775596.png
  - https://commons.wikimedia.org/wiki/File:Epiglottitis_endoscopy.jpg
  - http://images.slideplayer.com/14/4504594/slides/slide_38.jpg

- Case 3
  - https://s-media-cache-ak0.pinimg.com/736x/30/97/21/309721a57c3de9f59d8c78dd7efc17df--elderly-person-maine-coon-cats.jpg
  - http://i.dailymail.co.uk/i/pix/2010/02/20/article-1252497-0863b102000005dc-337_468x327.jpg
  - https://upload.wikimedia.org/wikipedia/commons/a/a5/Hangman%27s_fracture.JPG
**Images References**

- **Case 4:**
  - https://c1.staticflickr.com/3/2464/3689122491_709f6c481d_b.jpg

- **Case 5**
  - https://www.google.com/search?as_q=clavicle+fracture&as_epq=&as_oq=&as_eq=&cr=&as_sitesearch=&safe=images&tbs=sur:f#imgrc=3tRAGKntLXsbWM

- **Case 6**
  - http://www.rch.org.au/uploadedImages/Main/Content/clinicalguide/guideline_index/Figure-3_Remodelling_Humeral-shaft.jpg
  - https://upload.wikimedia.org/wikipedia/commons/thumb/0/00/Humerus_spiral_fracture.png/771px-Humerus_spiral_fracture.png
  - https://www.flickr.com/photos/patdavid/5802238803

- **Case 7**
  - https://upload.wikimedia.org/wikipedia/commons/1/1d/Fat-Pad-Sign_Ellenbogen_bei_unverschobenen_Radiuskoepfchenfraktur.png
  - https://pixabay.com/p-1537470/?no_redirect
  - https://upload.wikimedia.org/wikipedia/commons/b/bc/Sailsign.PNG
  - https://upload.wikimedia.org/wikipedia/commons/8/89/AnteriorandPSailSign.png
  - https://www.orthopaedicsone.com/download/attachments/4031018/Elbowsailsign.jpg

- **Case 8**
  - http://www.freestockphotos.biz/stockphoto/15269
  - https://commons.wikimedia.org/wiki/File:Change_Fracture_of_T10_and_T9_from_MVC.jpg
  - https://www.emergencymedicinekenya.org/chance-fractures/
Case 9
- https://commons.wikimedia.org/wiki/File:Lobaerpneumonie.jpg

Case 10
- https://pixabay.com/p-498473/?no_redirect
- http://learningradiology.com/caseofweek/caseoftheweekpix/cow771rg.jpg

Case 11
- https://i.ytimg.com/vi/X5X1K5tF2aA/maxresdefault.jpg
- http://www.pinestreetpt.com/library_wrist_41/
- https://lifeinthefastlane.com/colles-4/

Case 12
- https://pixabay.com/p-99175/?no_redirect
- https://commons.wikimedia.org/wiki/File:Pneumothorax_gif_1.gif
- https://commons.wikimedia.org/wiki/File:Pneu.jpg

Case 13
- https://www.flickr.com/photos/bike/2653863827

Case 14
- https://commons.wikimedia.org/wiki/File:NMBarScene.jpg
- http://www.guildfordupperlimb.co.uk/images/uploaded/boxers1.jpg
IMAGES REFERENCES

- **Case 15**
  - https://commons.wikimedia.org/wiki/File:Knee_anatomy.jpg
  - http://www.shaw.af.mil/News/Photos/igphoto/2001786000/

- **Case 16**
  - https://c1.staticflickr.com/3/2294/2809348460_71fe795a73.jpg
  - https://commons.wikimedia.org/wiki/File:Calcaneus_Fracture.jpg
  - http://eoorf.com/AnkleFoot/AnkleFoot/calcaneous%20anat.html

- **Case 17**
  - https://radiopaedia.org/cases/pseudo-jones-fracture
  - http://www.fprmmed.com/Pages/Ortho/PSEUDO-JONES_FRACTURE.html

- **Case 18**
  - http://img.medscapestatic.com/pi/meds/ckb/70/40370tn.jpg

SOURCE REFERENCES

- Rosen’s Emergency Medicine
- First Aid for the Family Medicine Boards
- Radiopaedia
- Wikipedia Images
- Learning Radiology