Mini Med School:

Tales of Emergency Medicine

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Christiana Care EM

PGY-2 & PGY-3

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Overview

- Introduction to Emergency Medicine (EM)
- Responsibilities of EM Physicians
- Common Emergencies
- Cases

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Introduction to Emergency Medicine

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What is Emergency Medicine?

- Specialists of acute care and resuscitation [1]
- Anything can walk in, anytime
  - Low to high acuity
- Rapid decision-making
- Treat everyone regardless of background or ability to pay

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History of EM

- Patients required unscheduled care that the system could not accommodate
  - Specialization of EM started to gain traction in 1960s
- 1968: American College of Emergency Physicians (ACEP) formed
  - Driving force for Board specialty status (still the largest EM representative group today)
- 1970: First EM residency program opened at the University of Cincinnati
- 1976: American Board of Emergency Medicine (ABEM) and Society for Academic Emergency Medicine (SAEM) formed
- 1979: EM officially recognized as a specialty by American Board of Medical Specialties (ABMS) [2]
  - Christiana Care EM residency established [3]

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More History of EM

- 1980: First EM Board-certifying exam
- 1986: Emergency Medical Treatment and Active Labor Act (EMTALA) passed by Congress
  - Meant to ensure nondiscriminatory access to emergency medical care [4]
- 1991: First combined EM residency program, with Internal Medicine (EM/IM) [5]
  - Christiana Care EM/IM residency established
- 2007: First combined EM residency program with Family Medicine (EM/FM) at Christiana Care [6]
- EM is now practiced in many countries worldwide and continues to expand

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Urgent Care vs Emergency Department

- Urgent Care: non-life-threatening needs [7]
- Emergency Department
  - Trauma Centers (Level 1-3 in Delaware) [8]
  - Other capabilities: STEMI, Stroke
  - Christiana:
    - Level 1 Trauma Center (only one in Delaware) [9]
    - Stroke and STEMI capable

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Path to Emergency Medicine

- 4 years undergraduate college
- 4 years medical school
- 3-4 years Emergency Medicine Residency
  - 5-year Combined Residency programs: EM/IM or EM/FM
- Certifying Board exam

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Responsibilities of EM Physicians

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Management in the Emergency Room

- Initial assessment
- Stabilization
- Diagnosis
- Treatment
- Disposition

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Initial Assessment

- Triage
- Vital signs: Heart rate, Respiratory rate, Oxygen saturation, Blood pressure, Temperature
- How does the patient look?
- Does an alert need to be activated?
  - EKG reviews
  - Stroke evaluations
  - Trauma evaluations

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Stabilization

- ABC
  - Airway, Breathing, Circulation
- A: Is the airway clear?
- B: Is the patient breathing?
- C: Is the blood pressure low?
- Intervene as needed

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Diagnosis

- Vital signs
- Physical exam
- Blood work
- Imaging (X-Rays, Ultrasound, CT scans)
  - Point-of-care Ultrasound (POCUS) frequently used
- Culmination of full patient evaluation

Diagnosis: POCUS

- Bedside use of ultrasound
- Echocardiography (Heart)
- Gallbladder (Gallstones)
- E-FAST (Trauma)
- Obstetrics/OB (Evaluate baby)

Treatment

- Interventions for stabilization: Oxygen, IV fluids
- Tylenol for fever
- Pain medication
- Antibiotics
- Procedures

Treatment: Procedures

- Laceration repairs
- Incision & drainage
- Foreign body removal
- Fracture and dislocation reductions
- Intubation
- Chest tube
- And more!

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Laceration Repairs

- Identify, irrigate, repair
- Repair options
  - Sutures
  - Staples
  - Steri-strips
  - Skin glue
- Risks: Infection, Cosmetic [10]

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Incision & Drainage

- Drain abscess
- Local anesthesia for pain control
- Risks: Worsening infection, Damage to surrounding structures [11]

Foreign Body Removal

- Nose, ears, and more
- Toys, rocks, food, etc.
- Risks: Damage to surrounding structures, Bleeding, Infection [12]

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Fracture / Dislocation Reductions

- Broken bones that are dislocated need to be reduced and splinted
  - No dislocation: may just need splint or sling
- Dislocated joint without fracture can be reduced
- Risks: Nerve or blood vessel injury, Pain, Need for surgery [13]

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Normal Wrist X-ray

Figure 1: Normal left wrist x-ray, lateral view. Case courtesy of Dr. Mohd Radhwan Bin Abidin, Radiopaedia.org, rID: 98946 [14]

Figure 2: Normal left wrist x-ray, frontal view. Case courtesy of Dr. Mohd Radhwan Bin Abidin, Radiopaedia.org, rID: 98946 [14]

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Abnormal Wrist X-ray: Fractured and Dislocated Ulna and Radius

Figure 3: Right-sided Smith fracture, lateral view. Case courtesy of Dr. Jan Frank Gerstenmaier, Radiopaedia.org, rID: 25199 [15]

Figure 4: Right-sided Smith fracture, frontal view. Case courtesy of Dr. Jan Frank Gerstenmaier, Radiopaedia.org, rID: 25199 [15]

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Normal (left) and Abnormal (right) Shoulder X-rays: Anterior Shoulder Dislocation

Figure 5: Normal left shoulder x-ray. Case courtesy of Dr. Frank Gaillard, Radiopaedia.org, rID: 7505 [16]

Figure 6: Left-sided anterior humerus dislocation. Case courtesy of Dr. Jeremy Jones, Radiopaedia.org, rID: 7132 [17]

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Intubation

- Hypoxia despite other interventions
  - Failure to ventilate and oxygenate
- Inability to protect airway
- Risk: Esophageal intubation, Surgical intervention [18]

Chest Tube

- Collapsed lung (Pneumothorax)
- Fluid around the lung (Pleural effusion)
- Risks: Damage to surrounding structures, Bleeding, Infection [19]

Normal Chest X-ray

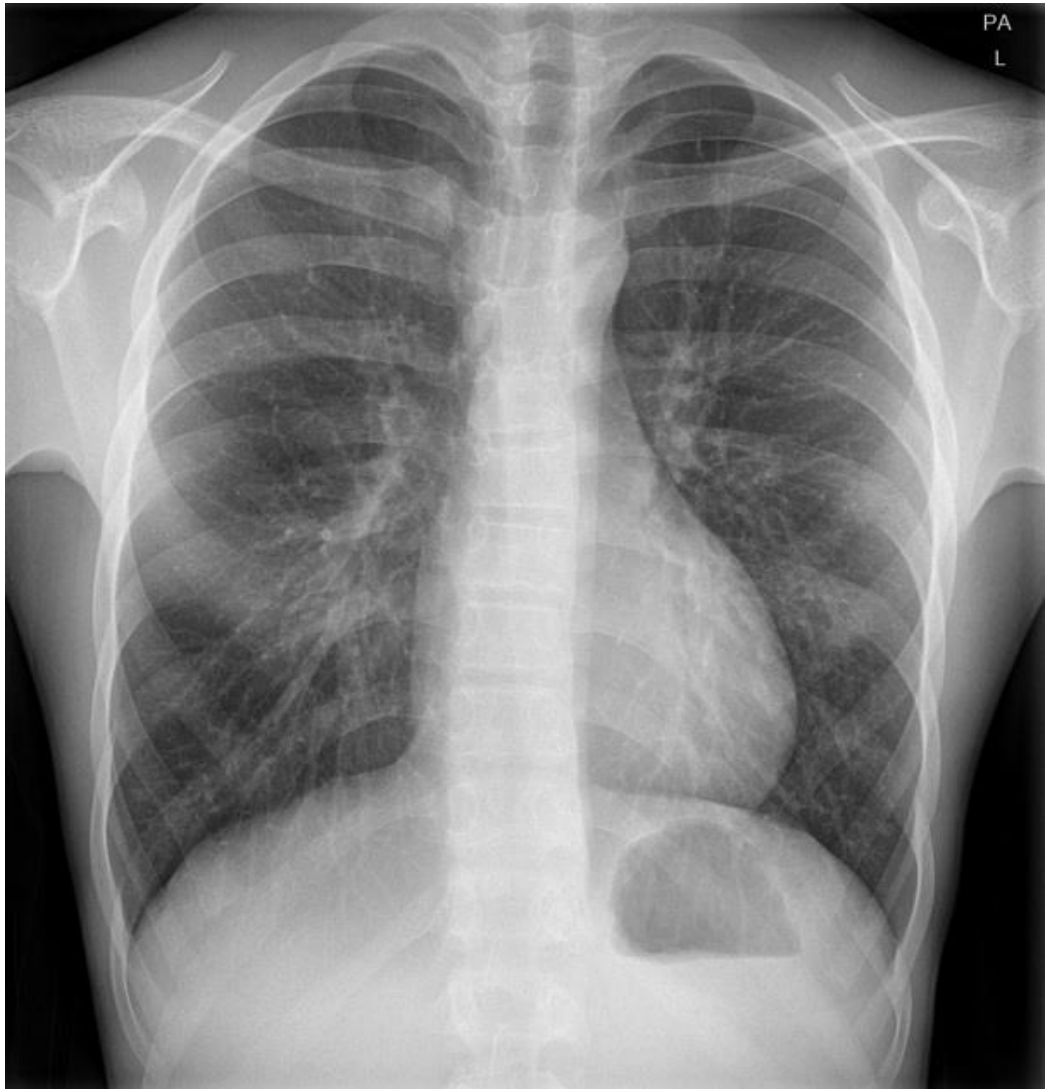

Figure 7: Normal chest x-ray. Case courtesy of Dr. Derek Smith, Radiopaedia.org, rID: 62093 [20]

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Abnormal Chest X-rays: Pneumothorax (left) and Pleural Effusion (right)

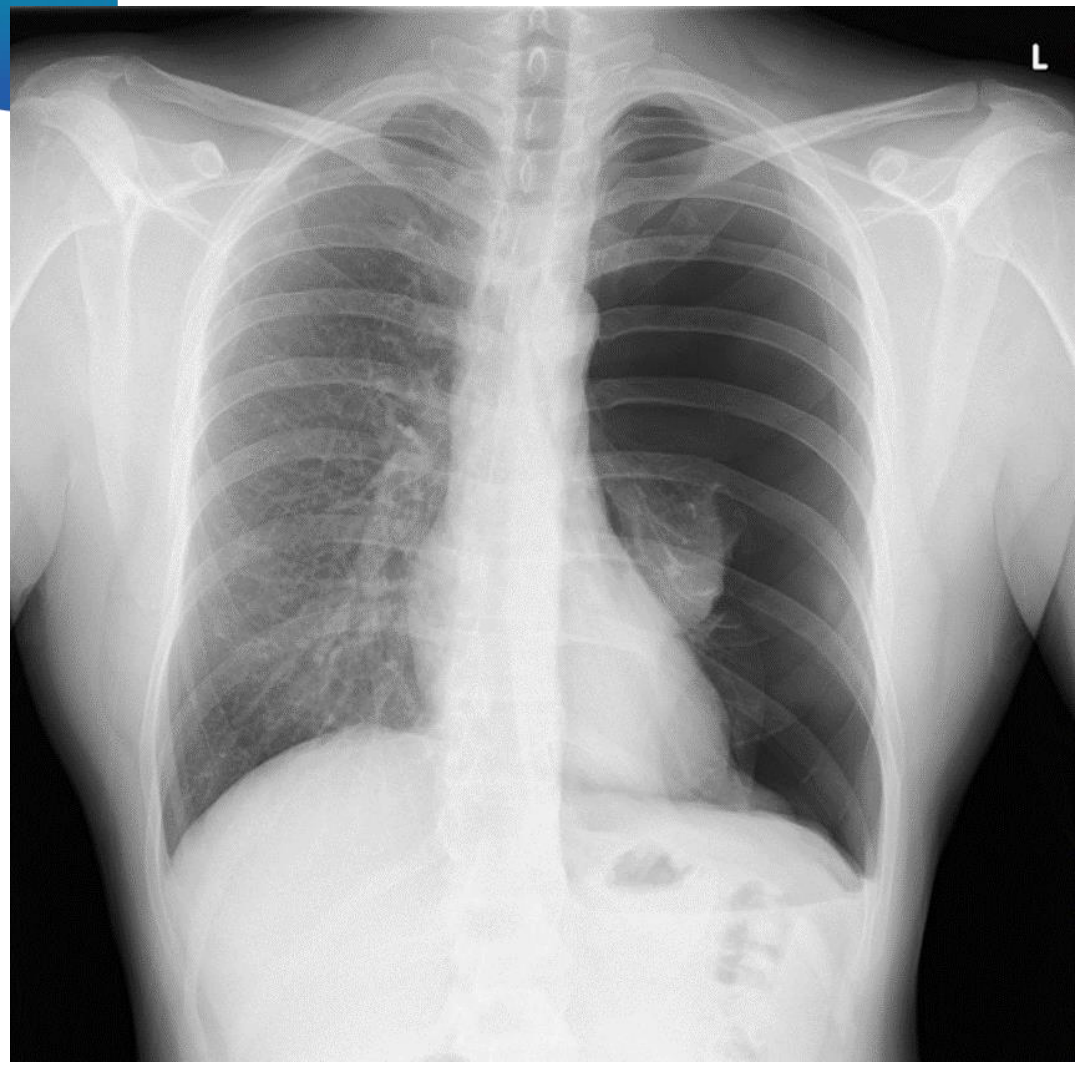

Figure 8: Large left-sided pneumothorax. Case courtesy of Dr. Ian Bickle, Radiopaedia.org, rID: 86926 [21]

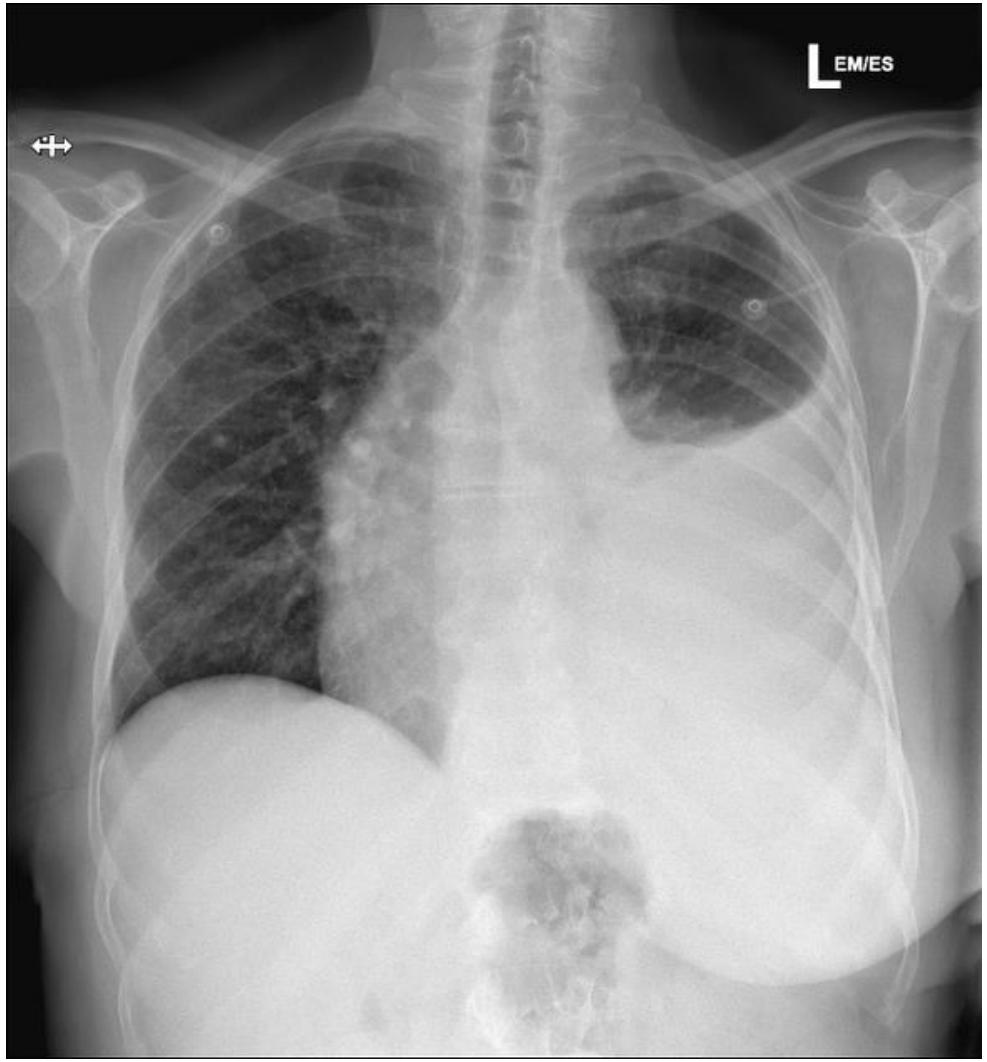

Figure 9: Large left-sided pleural effusion. Case courtesy of Dr. Craig Hacking, Radiopaedia.org, rID: 80388 [22]

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Chest Tube Example

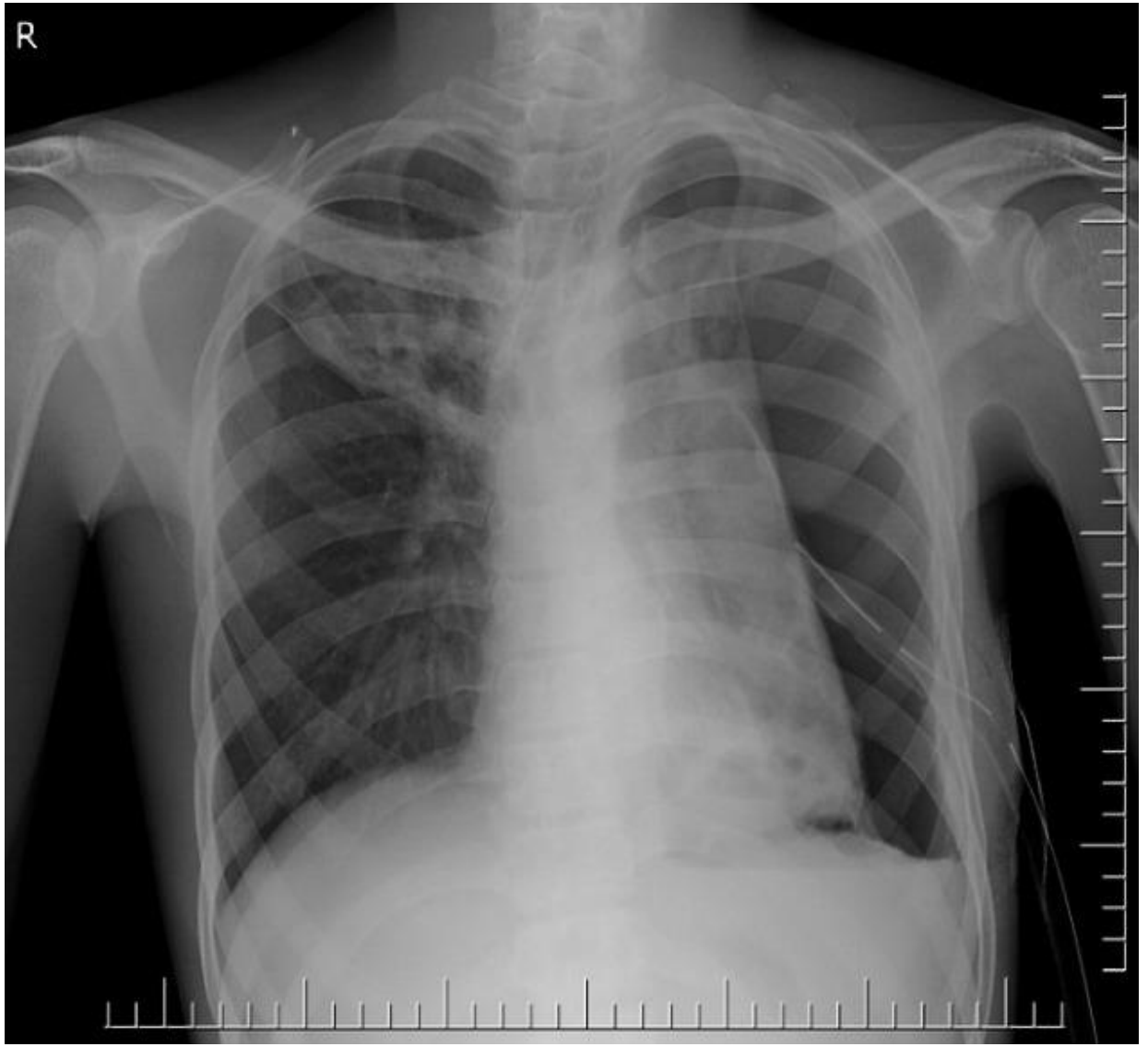

Figure 10: Left-sided pneumothorax with displaced chest tube. Case courtesy of Dr. Aditya Shetty, Radiopaedia.org, rID: 27673 [23]

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Disposition

- Discharge
- Admit
  - Floor
  - ICU

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ER Management Review

- Initial assessment (vitals, brief evaluation)
- Stabilization (as needed)
- Diagnosis (tests, imaging)
- Treatment (medications and procedures)
- Disposition (stay or go)

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Common Emergencies

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Common ER Presentations

- Chest pain
- Abdominal pain
- Respiratory distress
- Trauma

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Emergency Alerts

- Stroke alert
- STEMI alert (Heart attacks)
- Trauma alert

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Stroke Alert

- National Institute of Health Stroke Scale (NIHSS)
- Window for intervention:
  - Time from last known normal
  - 4.5 hours for thrombolytics ("clot buster")
  - 24 hours for thrombectomy (mechanical clearance) [24]

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Recognizing a Stroke

- BE FAST [25]
  - Balance (loss of coordination)
  - Eyes (vision changes)
  - Face (drooping on one side)
  - Arms (weakness of arm or leg on one side)
  - Speech (slurred speech, difficulty speaking or understanding)
  - Time
- Right side of the brain controls the left side of the body and vice versa [26]

STEMI Alert

- ST-Elevation Myocardial Infarction
  - MI = Heart attack
- Sudden, crushing chest pain
- Electrocardiogram (ECG/EKG) within 10 minutes
- Interventions: Aspirin, Nitroglycerin
- Treatment: Cath lab
  - Door-to-balloon time within 90 minutes [27]

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Normal EKG

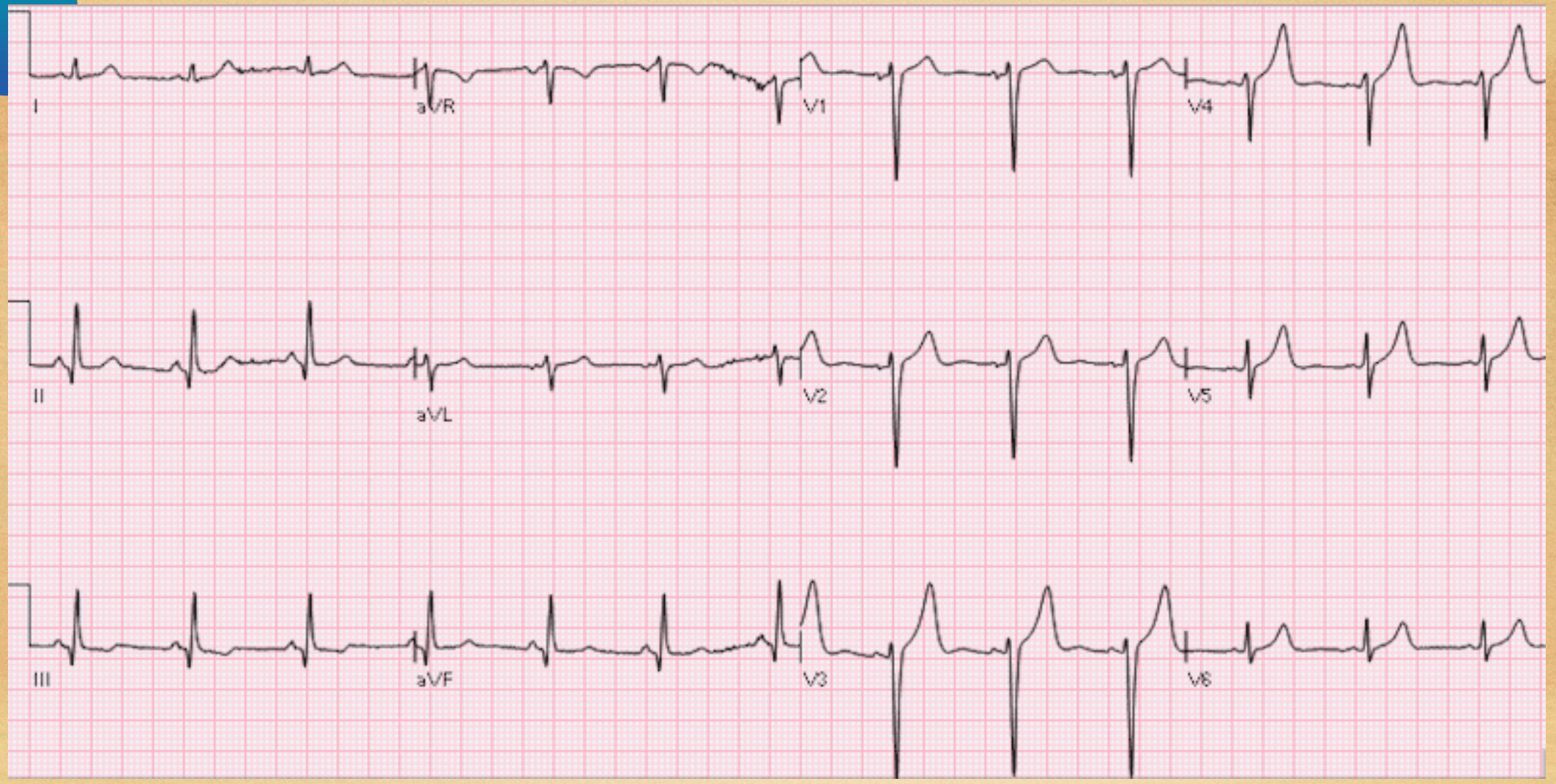

Figure 11: REBEL ECG of the Week #6, Old ECG by Dr. Salim Rezaie, CC BY-NC-ND 3.0 [28]

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STEMI

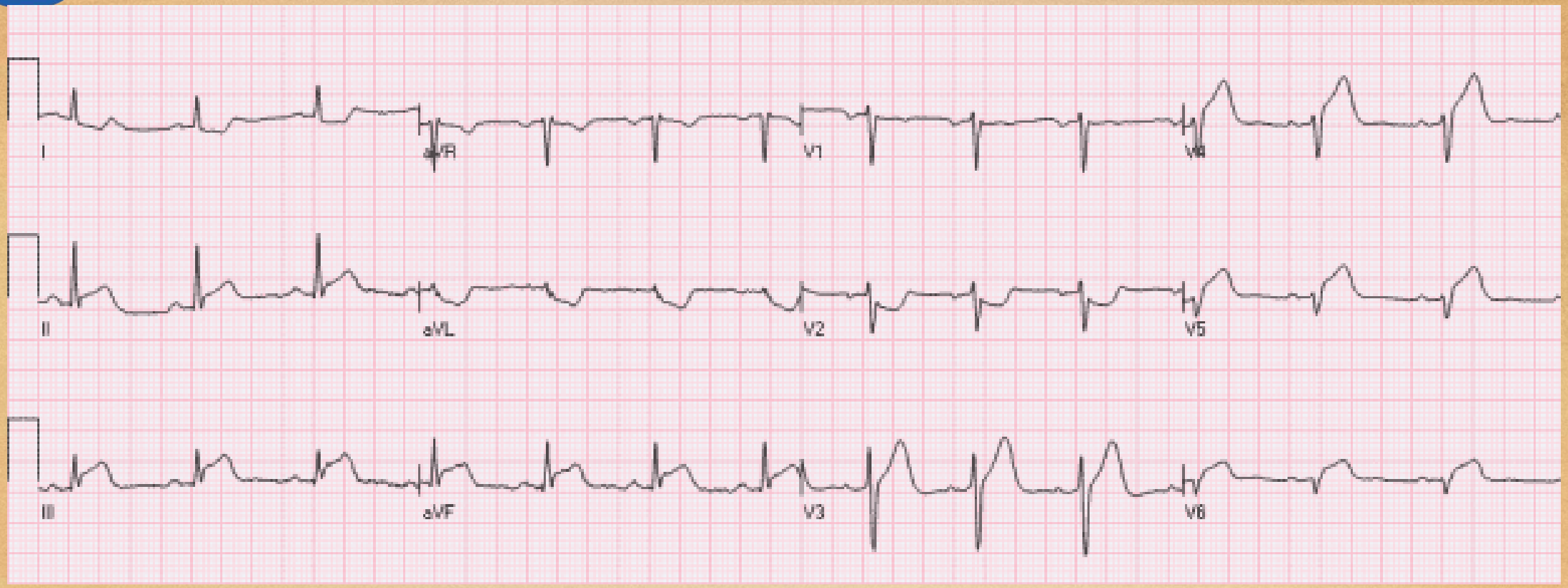

Figure 12: REBEL ECG of the Week #2 by Dr. Salim Rezaie, CC BY-NC-ND 3.0 [29]

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Trauma Alert

- Significant traumatic injury requiring immediate evaluation and intervention
  - Life-threatening bleeding
  - Head injury causing confusion/coma
  - Injury to critical areas of the body
- Advanced Trauma Life Support (ATLS)
  - Primary survey (ABC)
  - Secondary survey (full physical exam)
  - Imaging
- Disposition

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ATLS

- Primary (ABCDE)
  - ABC
    - Airway, Breathing, Circulation
    - Intervene on each if needed before moving on
  - DE
    - Disability (Glasgow Coma Scale/GCS), Exposure
- Secondary
  - Full physical exam for signs of trauma
- Imaging: X-rays, Ultrasound (E-FAST), CT [30]

E-FAST

- Extended Focused Assessment with Sonography for Trauma
- 5 views [31]
  - Subxiphoid: Heart
  - Right Upper Quadrant (RUQ): Liver, Right kidney
  - Left Upper Quadrant (LUQ): Spleen, Left kidney
  - Pelvic: Bladder
  - Lungs

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Trauma Disposition

- Stable patient
  - E-FAST positive -> CT scan
  - E-FAST negative -> CT, serial E-FAST, or observation
- Unstable patient
  - E-FAST positive -> Operating room
  - E-FAST negative -> CT scan [32]
- Variation on case-by-case basis

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Cases

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Case #1

73 year old male presenting with drooping of the face and an inability to move or feel the left side of his body starting half an hour prior to arrival.

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What is the diagnosis?

A. Migraine headache

B. Meningitis

C. Stroke

D. He's faking

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What side of the brain is most likely affected?

A. Right

B. Left

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Case #2

42 year old man presents after falling off a ladder. Says he landed on his left leg and felt a “snap”. The left lower leg is deformed with a wound showing exposed bone. Xray results are shown above.

Figure 13: Distal leg fractures. Case courtesy of Dr. Kevan English, Radiopaedia.org, rID: 184724 [33]

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What bone is broken?

A. Humerus

B. Tibia

C. Rib

D. Clavicle

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What does the term "Open Fracture" mean?

A. A fracture involving more than two bones

B. A fracture that is exposed to the outside environment

C. A fracture associated with a dislocation

D. A fracture that feels comfortable sharing its feelings

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Case #3

55 year old male presenting with crushing central chest pain starting 1 hour prior to arrival. Pain goes into his neck and into his right arm. He is sweaty and vomiting when you see him. EKG results are shown.

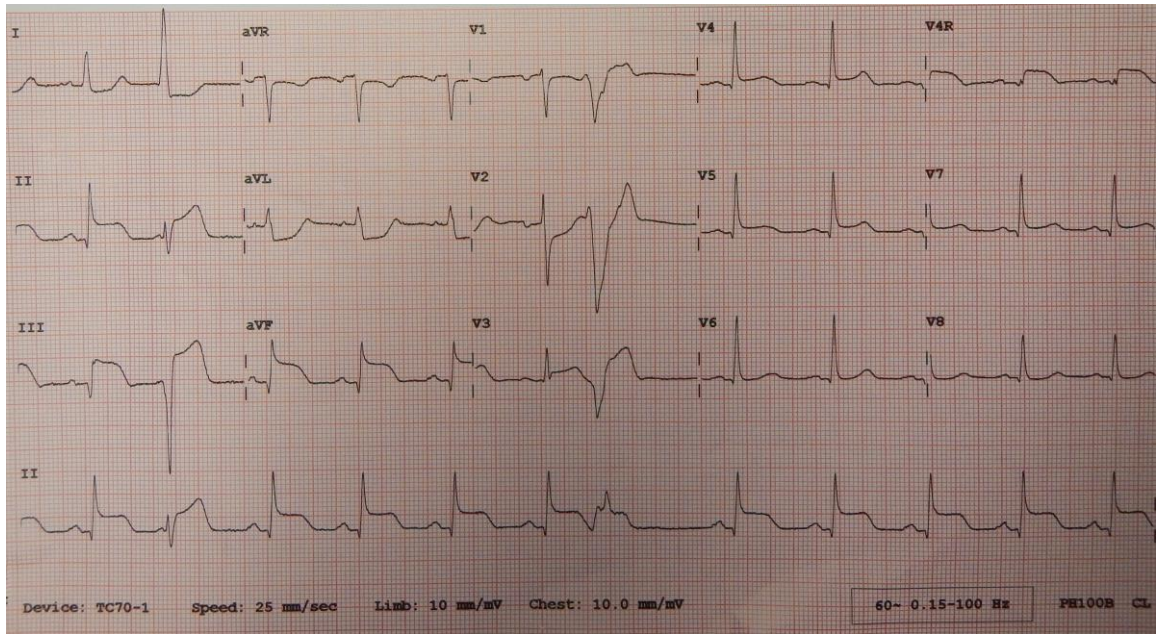

Figure 14: 15 lead ECG showing inferior and right ventricular infarct by Dr. James Heilman, CC BY-SA 4.0 [34]

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What is the diagnosis?

A. Acid Reflux

B. Gallstones

C. Pneumonia

D. Heart Attack

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Which of the following medications has been proven to help prevent this patient from dying?

A. Tylenol

B. Ibuprofen

C. Aspirin

D. Acetaminophen

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Case #4

A 15 year old female presents to the hospital with fever, nausea/vomiting, and abdominal pain. The symptoms have been present for about a day. The pain was initially in the middle but has now moved to the right lower part of her stomach.

What is the diagnosis?

A. Pneumonia

B. Pancreatitis

C. Urinary Tract Infection

D. Appendicitis

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Which of the following organs can you NOT live without?

A. Liver

B. Spleen

C. Gallbladder

D. Appendix

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Case #5

27 year old male presenting with a gunshot wound to the left chest. He is in severe distress. He is having difficulty breathing, has low oxygen counts, and low blood pressure. Chest Xray results are shown.

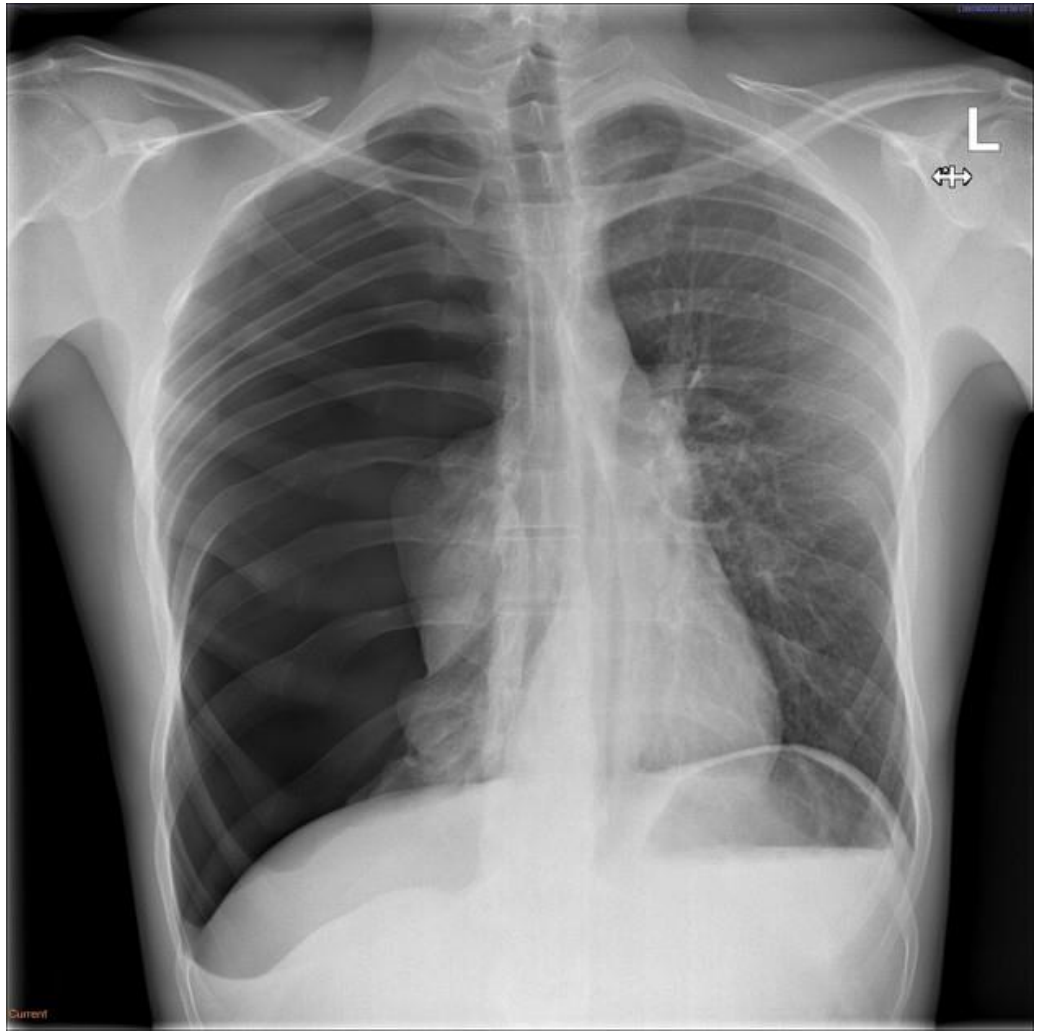

Figure 15: Tension pneumothorax. Case courtesy of Dr. Jack Garnham, Radiopaedia.org, rID: 82478 [35]

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Which of the following procedures will fix the problem?

A. Chest compressions

B. Pain control

C. Central line placement

D. Re-inflate the lung

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How will you Re-Inflate the lung?

A. Placing a chest tube

B. Placing an arterial line

C. Transfusing blood

D. Panicking

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Case #6

A 26 year old football player collapses on the field after being struck in the chest during a play. He has no pulse. Initial rhythm check shows an irregular electrical pattern in the heart called ventricular fibrillation. Chest compressions are started.

Which of the following songs has a beat that matches the tempo at which you are supposed to perform chest compressions?

A. Don't Stop Believing (Journey)

B. Staying Alive (Bee Gees)

C. Bad Medicine (Bon Jovi)

D. Another One Bites the Dust (Queen)

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What is the name for this condition?

A. Second impact syndrome

B. Commotio cordis

C. Concussion

D. Unnecessary roughness (15 yard penalty)

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Case #7

18 year old female college student presents with worsening headache and fever over the past several days. She also says that she is having trouble moving her neck. A lumbar puncture is performed that shows bacteria in the cerebrospinal fluid.

What is the diagnosis?

A. Complicated migraine

B. Sinusitis

C. Meningitis

D. Muscle strain

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Which of the following types of medicines should be started immediately?

A. Blood pressure medication

B. Insulin

C. Vitamins

D. Antibiotics

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Case #8

23 year old male with history of type 1 diabetes presents with nausea, vomiting, and abdominal pain that has been worsening for several days. He ran out of his normal medicines about a week ago. His blood sugar is extremely high and his blood is acidic.

What is the diagnosis?

A. Lupus

B. Diabetic Ketoacidosis (DKA)

C. Bowel Obstruction

D. Cancer

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Which of the following medications will correct his condition?

A. Aspirin

B. Insulin

C. Antibiotics

D. Nitroglycerin

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Case #9

A 17y/o male presents with a sore throat. On exam, he has palpable lymph nodes in his neck and exudates on his tonsils which are shown. A swab is performed which is positive for a Group A beta-hemolytic bacteria.

Figure 16: Strep throat by Dr. James Heilman, CC BY-SA 4.0 [36]

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What is the diagnosis?

A. Strep throat

B. Measles

C. Mononucleosis

D. Retropharyngeal abscess

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In the past, if left untreated this condition could lead to which of the following feared complications?

A. Rheumatic heart disease

B. Vasculitis

C. Abdominal adhesions

D. Halitosis

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References (Part 1)

1. Rosen B, Rosen P, Schofer J, Asher S, Wald D, Cheaito MA, et al. Is Emergency Medicine the Right Choice for Me? The Journal of Emergency Medicine. 2019 Mar;56(3):e35–8.
2. Huecker M, Shreffler J, Platt M, O'Brien D, Stanton R, Mulligan T, et al. Emergency Medicine History and Expansion into the Future: A Narrative Review. Western Journal of Emergency Medicine. 2022 Apr 4;23(3):418–23.
3. Alumni | Christiana Care Emergency Medicine Residency Program in Delaware [Internet]. Christianacare.org. 2025. Available from: https://residency.christianacare.org/em/alumni.
4. Zibulewsky J. The Emergency Medical Treatment and Active Labor Act (EMTALA): what it is and what it means for physicians. Proceedings (Baylor University Medical Center) [Internet]. 2021 Oct 14;14(4):339–46. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1305897/.
5. Scott N, Rodos A, Dwyer R, Tyo C, Martin D. Emergency Medicine/Internal Medicine Combined Residency Graduates Have High Career Satisfaction and Commonly Practice in Both Specialties. AEM Education and Training. 2020 Jul 24;5(2).
6. First Emergency and Family Medicine residency program graduate exemplifies a synergy of two disciplines - ChristianaCare News [Internet]. ChristianaCare News. 2012 Jun 6 [cited 2025 Apr 14]. Available from: https://news.christianacare.org/2012/06/first-emergency-and-family-medicine-residency-program-graduate-exemplifies-a-synergy-of-two-disciplines/.
7. Dixit-Patel P. Should I Go To the Emergency Room, Urgent Care or Primary Care? [Internet]. Christianacare.org. 2022 Dec 22 [cited 2025 Mar 26]. Available from: https://news.christianacare.org/2022/12/should-i-go-to-the-emergency-room-urgent-care-or-primary-care/.
8. American Trauma Society. Trauma center levels explained [Internet]. Amtrauma.org. 2019 [cited 2025 Mar 26]. Available from: https://www.amtrauma.org/page/traumalevels.
9. Trauma Department [Internet]. Christianacare.org. [cited 2025 Apr 14]. Available from: https://christianacare.org/us/en/emergency/trauma.
10. Newman RK, Heba Mahdy. Laceration(Archived) [Internet]. Nih.gov. StatPearls Publishing; 2022 Oct 8 [cited 2025 Apr 14]. Available from: https://www.ncbi.nlm.nih.gov/sites/books/NBK545166/.
11. Pastorino A, Tavarez MM. Incision and Drainage [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2023 Jul 24 [cited 2025 Apr 14]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK556072/.
12. Friedman EM. Removal of Foreign Bodies from the Ear and Nose. New England Journal of Medicine. 2016 Feb 18;374(7):e7.
13. Closed reduction of a fractured bone: MedlinePlus Medical Encyclopedia [Internet]. medlineplus.gov. 2022 [cited 2025 Apr 14]. Available from: https://medlineplus.gov/ency/patientinstructions/000521.htm.
14. Abidin MRB. Normal left wrist radiograph. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2022 Apr 15 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/98946. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).
15. Gerstenmaier JF. Smith fracture. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2013 Oct 12 [cited 2025 Apr 15]. Available from: https://radiopaedia.org/cases/25199. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).
16. Gaillard F. Normal shoulder. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2009 Nov 5 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/7505. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).
17. Jones J. Anterior shoulder dislocation. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2009 Sep 8 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/7132. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).
18. Avva U, Lata JM, Kiel J. Airway Management [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2025 Jan 19 [cited 2025 Apr 14]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470403/.
19. Ravi C, McKnight CL. Chest tube [Internet]. Nih.gov. StatPearls Publishing; 2022 Oct 3 [cited 2025 Apr 14]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459199/.
20. Smith D. Normal chest radiograph. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2018 Aug 1 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/62093. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

References (Part 2)

21. Bickle I. Large spontaneous pneumothorax. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2021 Feb 18 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/86926. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

22. Hacking C. Malignant pleural effusion. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2020 Jul 23 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/80388. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

23. Shetty A. Pneumothorax with displaced chest tube. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2014 Feb 13 [cited 2025 Apr 14]. Available from: https://radiopaedia.org/cases/27673. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

24. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the Early Management of Patients with Acute Ischemic stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic stroke: a Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association. Stroke [Internet]. 2019 Oct 30;50(12). Available from: https://www.ahajournals.org/doi/10.1161/STR.0000000000000211.

25. Darkhabani MZ, Homa-Bonell JK, Thoreson L, Bobholz JA, Spaulding D, Engebose M. BE FAST Versus FAST: A Randomized Pilot Trial Comparing Retention of Stroke Symptoms Between 2 Mnemonics. Journal of the American Heart Association. 2024 Sep 18;13(19).

26. Effects of stroke [Internet]. American Stroke Association. 2019 [cited 2025 Apr 14]. Available from: https://www.stroke.org/en/about-stroke/effects-of-stroke.

27. Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, et al. ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction—Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). Circulation [Internet]. 2004 Aug 3 [cited 2025 Apr 14];110(5). Available from: https://www.ahajournals.org/doi/10.1161/01.CIR.0000134791.68010.FA.

28. Rezaie S. REBEL ECG of the Week #6 - REBEL EM - Emergency Medicine Blog [Internet]. REBEL EM - Emergency Medicine Blog. 2013 Dec 12 [cited 2025 Apr 14]. Available from: https://rebelem.com/r-e-b-e-l-ecg-week-6/. Used under Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported (https://creativecommons.org/licenses/by-nc-nd/3.0/).

29. Rezaie S. REBEL ECG of the Week #2 - REBEL EM - Emergency Medicine Blog [Internet]. REBEL EM - Emergency Medicine Blog. 2013 Nov 11 [cited 2025 Apr 14]. Available from: https://rebelem.com/r-e-b-e-l-ecg-week-2/. Used under Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported (https://creativecommons.org/licenses/by-nc-nd/3.0/).

30. Kool DR, Blickman JG. Advanced Trauma Life Support®. ABCDE from a radiological point of view. Emergency Radiology. 2007 Jun 12;14(3):135–41.

31. White S, Dinh V. eFAST Ultrasound Exam Made Easy: Step-By-Step Guide [Internet]. POCUS 101. [cited 2025 Apr 14]. Available from: https://www.pocus101.com/efast-ultrasound-exam-made-easy-step-by-step-guide/.

32. Richards JR, McGahan JP. Focused Assessment with Sonography in Trauma (FAST) in 2017: What Radiologists Can Learn. Radiology. 2017 Apr;283(1):30–48.

33. English K. Distal tibia-fibula fractures. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2024 Feb 29 [cited 2025 Apr 15]. Available from: https://radiopaedia.org/cases/184724. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

34. Heilman J. 15 lead ECG showing inferior and right ventricular infarct [Internet]. 2015 Jun 1 [cited 2025 Apr 15]. Available from: https://commons.wikimedia.org/wiki/File:Inferior_and_RtV_MI_with_PVC_15_lead.jpg. Used under Creative Commons Attribution-ShareAlike 4.0 International (https://creativecommons.org/licenses/by-sa/4.0/).

35. Garnham J. Tension pneumothorax. Case study, Radiopaedia.org [Internet]. Radiopaedia. 2020 Sep 27 [cited 2025 Apr 15]. Available from: https://radiopaedia.org/cases/82478. Used under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (https://creativecommons.org/licenses/by-nc-sa/3.0/).

36. Heilman J. Strep throat [Internet]. 2015 Jun 14 [cited 2025 Apr 15]. Available from: https://commons.wikimedia.org/wiki/File:IDApp.JPG. Used under Creative Commons Attribution-ShareAlike 4.0 International (https://creativecommons.org/licenses/by-sa/4.0/).

Questions?

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