1 **50 SHADES of radiology**
- Vida Viliunas
- www.doctorvida.com.au

2 **Technique**
- Improve by actually presenting/ reporting
- Be systematic

3 **Basics**
- PA + lateral where possible
- AP for critically ill or trauma
- Expiration, lordotic or decubitus views

4

5

6 **DRSABCDE**
- have a system
- use it

7 **Basics**
- trachea
- mediastinum
- hila
- lungs
- review areas: apices, periphery, under + behind the H.diaphragms
- THE LATERAL FILM

8 **Surface anatomy anterior**

9
- lateral

10
- Surface anatomy posterior

11 **Diaphragm**
- Right dome higher because of the liver

12 **DRSABCDE**
- have a system
- use it

13 **Inspiration - Expiration**
- checking for pneomothorax

14 **checking for pneumothorax in expiration**
look for the radiolucency (darkness) on the ipsilateral side
identify the edge/ check for tension
look for a cause: rib #, the tall aesthenic male
associated surgical emphysema/ pneumomediastinum

15 **checking for pneumothorax in expiration**

16 **lordotic views**
- probably outdated now…

17 **try this quick quiz…**
- Identify the structures marked

18 **try this quick quiz…**
- Identify the structures marked
-
-
-
- 1 Aortic knuckle
- 2 pulmonary trunk
- 3 L atrial appendage
- 4 LV
- 5 RA (IVC is inferior to this)
- 6 SVC (R brachiocephallic v beyond this)
- 7 R hemidiaphragm

- 8 L hemidiaphragm
- 9 horizontal fissure
-
-

19

20 **Abnormal patterns: increased density**

- CONSOLIDATION
- INTERSTITIAL
- NODULE or MASS
- ATELECTASIS

21 **CONSOLIDATION**

- Lobar consolidation
- Diffuse consolidation
- Multifocal ill-defined consolidation
- Note “Silhouette sign” is the loss of lung/soft tissue interface

22 **CONSOLIDATION**

- The most common presentation is lobar
- the most common Dx is lobar pneumonia

23 **CONSOLIDATION**

- CAUSES list is broad: any FLUID/CELLS that replace GAS in alveolar space
- i.e. pulm edema, exudate, pus, inhaled water or blood
- Clinically: Ipsilateral expansion reduced, vocal fremitus increased, percussion dulled,insp crackles and possibly dec PaO2

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26 **COLLAPSE**

- appearance varies according to lobe involved
- features of volume loss distinguish collapse from opacification of consolidation without collapse
- FEATURES: elevation of ipsilateral h.diaphragm; crowding of ipsilateral ribs; shift of mediastinum to the side of collapse
- Identifying the collapse should be easy: then look for the cause

27 **RUL consolidation**

- Horizontal fissure as a border

28 **RUL consolidation**

29 **RUL Collapse**

- usually easy on frontal film: inc density on upper medial aspect; elevation of horizontal fissure + R hilum; loss of normal R medial cardiomediastinal contour; hyperinflation of the rest of the R side
- may be accompanied by non-specific signs of R atelectasis: elev R h.diaphragm; crowding of R ribs; mediastinal + tracheal shift to the right

30 **RUL collapse**

- CAUSE: commonly a hilar mass
- Golden S sign = reverse S formed by RUL shifted up + accentuating the R hilar mass

31

32 **RML consolidation**

- opacification of the RML abutting the horizontal fissure
- indistinct right heart border
- loss of medial aspect of R h.diaphragm
- airbronchograms; some RML collapse

33 **RML consolidation**

- patchy RML consolidation

34 **RML collapse**

- can be subtle on frontal film
- of all the lobes, the one most likely to be chronically collapsed

35 **RML collapse**

36 **RML collapse**

- horizontal fissure no longer visible
- blurred R heart border
- elevation of the R h.diaphragm
- crowding of R ribs
- shift of mediastinum to R

37

38 **RLL consolidation**

- loss of R h.diaphragm (subtle here)
- loss of R ht border
- opacity in RLL
- mainly a posterior structure

39 **RLL consolidation**

40 **RLL COLLAPSE**

- triangular opacity at medial base of R lung
- medial h.diaphragm is lost

41 **RLL collapse**

- R h.diaphragm outline lost posteriorly
- lower thoracic vertebrae appear denser than normal

42

43 **LUL consolidation**

- area of increased opacity within LUL
- characteristically NOT DENSE in PA view
- loss of upper mediastinal contour
- Note air bronchogram, some loss of L heart border

44

45 **LUL collapse**

- LUL collapses anteriorly
- mediastinal contour may be obliterated at ht border
- anterior Ao arch often obliterated
- L hilum drawn upwards
- elevated L h.diaphragm; tenting
- crowding of ribs

46

47 **LINGULAR consolidation**

48 **LLL consolidation**

49 **LLL consolidation**

50 **LLL collapse**

51 **LLL collapse**

- retrocardiac lung is dec
- desc Ao outline is lost
- loss of medial part of L h.diapragm

52

53 **Cardiac valves**

- BLUE aortic
- PINK mitral
- GREEN pulmonary
- YELLOW tricuspid

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55

- Aortic valve is above the red line
- Mitral valve is below the line
- The aortic valve is usually superior

56 **Non-cardiogenic**
Pulm oedema

- Near drowning
- Oxygen Rx/ neg pressure PE
- Trauma/ Tx/ TRALI
- CNS/ neurogenic
- Allergic alveolitis

- Renal failure (cardiog+non-cardiog)
- Drugs
- Inhaled toxins
- Altitude (HAPE)
- Contusion

57 **An enlarged heart**
- Congestive cardiac failure: Upper lobe blood diversion/ Kerley Blines/ Bat's wing haziness around the hila/ alveolar shadowing

58 **Cardiogenic Pulmonary edema**
- vascular redistribution
- indistinct hila
- alveolar infiltrates

59 **Cardiac failure**
- CT ratio >50%
- 1Upper zone vessel enlargement
- 2 pulmonary oedema (bat wings)
- 3 Kerley B
- 4 pl effusion

60 **LA enlargement etc…**

61 **Full description:**
- Cardiomegaly
- LA enlargement
- CAUSE: aortic and mitral valve disease
- Sternotomy wires + prosthetic valves noted

62

63

64

65 **Describe this CXR**
- What are the possible causes?

66 **Describe this CXR**

- Markedly enlarged cardiac silhouette; double contour of Rt ht border and splaying of the carina
-
- RA is blue
- LA orange
-
- CT showed dilatation of all chambers

67 **Mediastinal mass**

- Arrows show widened mediastinum
- poorly defined Ao knuckle
- *wide R paratracheal stripe
- lateral view helps to locate…

68 **…Anterior Mediastinal mass**

- the mass is actually in the anterior mediastinum

69 **Bilateral hilar enlargement**

- both hila enlarged + inc density
- remember the 3 structures: Pulm Artery, Bronchi, Nodes
- DDx: sarcoid, lymphoma, metastatic disease, infection or pulmonary arterial hypertension

70 **SUBARACHNOID haemorrhage**

- Worst headache ever
- CT is the modality of choice, high sensitivity within 24h
- blood appears as hyperdense compared with CSF
- ECG ischaemic changes are common (catechol surge?)

71 **EPIDURAL/EXTRADURAL Haematoma**

- arterial blood between skull + dura: often mass effect
- usu after blunt trauma/ mid.meningeal artery tear (+ so usu temporoparietal)
- Biconvex/ well-defined
- herniation can occur within hours
- classically: brief LOC then lucid period - “talk + die”

72 **SUBDURAL haematoma**

- blood collects betw dura + arachnoid - acute bleeds typically concave creScentic in shape, irregular inner margin
- EDH are ipsilateral, SDH are typically contra-coup
- SDH can extend beyond suture lines (unlike EDH)
- slow, low pressure venous bleed delays presentation (weeks)
- clinical picture is varied
- acute lesions are hyperdense; chronic are hyPOdense

73 **2 major classes of herniation:**
above or below the tentorial notch

- Supratentorial herniation
- 1 Uncal (transtentorial)
- 2 Central
- 3 Cingulate (subfalcine)
- 4 Transcalvarial
- 5 Tectal (posterior)
-
- Infratentorial herniation
- 5 Upward (upward cerebellar or upward transtentorial)
- 6 Tonsillar (downward cerebellar) = coning

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- SITE: supra or infra tentorial
- SEVERITY: volume, extension, mass effect
- CAUSE: eg signs of trauma

75

76 **Acknowledgements**

- radiopaedia.org
- wikiradiography.net
- lifeinthefastlane.com
- radiologyassistant.nl

• radiology masterclass.co.uk		
• E Dick Chest x rays made easy articles	Student BMJ Vols 8-9 Sept 2000-Feb 2001	An excellent series of 5