BASIC CHEST DDxs for Boards
JJ and Co., 2008

UNIVERSAL
* TIC MTV but in the right order to sound wise
  * "initially" INIT(INAL)
  * but if I forget these at the end there will be a crash: MVC

INIT(INAL) MVC
Infection
Neoplasm
Inflammation
Trauma
(Inhalational, Allergic) for chest only

Metabolic (for MSK, two subcategories: hormones and vitamins)
Vascular
Congenital

ACUTE CONSOLIDATION
IAPH: 4 big ones - pus, water x 2 and blood
* Infection - bact, viral, fungal, mycobact
* Aspiration
* Pulm edema - cardiogenic or noncardiogenic
* Hemorrhage (pulm/renal, infarct)

CHRONIC CONSOLIDATION
3 big ones, plus 2 x 2 funny ones. Could use "BALLS"
* Recurrent acute
* Organizing pneumonia
* Tumor: Lymphoma or BAC
* Two funny pneumonias: "eosinophilic or lipid pneumonia"
* Two alveolar things: alveolar proteinosis, alveolar sarcoidosis (MUST be on the list)
* If peds, skip these, replace with congenital Big 4 (CCAM, CDH, sequestration, CLE) and mediastinal mass (ant: thymus, mid: bronchogenic cyst or cardiomegaly, post: neuroblastoma)

PULMONARY EDEMA
Flow = K * dP * d(pi), ie "toxins, cardiogenic, or organ failure"
* k = permeability (batwing, no effusion or kerley B)
  - toxic inhalation (ARDS, AIP, eg. to CO poisoning)
  - aspiration: gastric contents or drowning
  - hematogenous toxins: sepsis, drugs
  - neurogenic

  * dP = mostly cardiogenic (effusions, kerley B)
    - myocardium (MI)
    - valves (mitral stenosis or regurg - can be a jet to RUL)
    - PV's: pulm veno-occlusive disease
    - pericardium: (tamponade)
    - pediatric - TTN or congenital heart disease (eg. Infracardiac TAPVR)
    - re-expansion

  * d(pi) = oncotic (organ failure)
    - hepatic or renal failure
    - fluid overload - CHF, overhydration (technically dP but put here)

UNILATERAL PULMONARY EDEMA
* position - lying on side
* abn lung
  - lobar emphysema, bullae, unilateral transplant, reexpansion
* abn vessels
  - PE or congenital hypoperfusion
  - jet of mitral regurg to RUL

MASS AT LUNG BASE
* Pulmonary nodule/mass, plus:
  * Congen: sequestration
  * Acquired: hernia

PULMONARY NODULE/S (CAVITARY OR NOT)
* push through to MVC, every time.
* "...and abn airways" to finish.

  * Infec (up to 5 parts)
    - mycobacterial - granuloma (TB)
    - fungal - cocci, histo, PCP
    - bacterial - abscess (staph)
    - viral (CMV nodule)
    - hydatid cyst

  * Neoplasm
    - benign: hamartoma
    - low grade: carcinoid
    - malig: primary lung ca (SCC), met (mucinous GI, serous ovarian), lymphoma

  * Inflamm "WoRSe"
    - Wegeners (shaggy, multiple)
    - Rheumatoid (with fibrosis)
    - Sarcoïd

  * Trauma - laceration, hematoma

  (InAl, M a bit of a stretch, but VC part is important, keep going)

  * Vascular - AVM (!?) - feeding, draining vessels
  * Congen - bronchogenic cyst - central location

  * ...And abn airways:
    - laryngotracheal papillomatosis (child, endotracheal lesions)
    - cystic bronchiectasis, if fluid filled, mimics a nodule

NODULAR INTERSTITIAL PATTERN ON CXR
* if specifically miliary, go to that list.
* Otherwise it's broad, primarily in the I-InAl part of the list; remember EG:
  * "CT would show distribution better"

  * Acute:
    - infectious (TB, atypical bact, viral)
  * Chronic
    - (N) PTLD, lymphoma, BAC, mets
    - (I) sarcoïd
    - (In) pneumoconiosis (esp. coal workers) or smokers
    - (Al) HP, EG

  - try (P)CESTS as backup, did you remember all of them?

NODULAR INTERSTITIAL PATTERN ON CT:
* ie, small (few mm), not big nodules
* 3 categories, 2-3 in each

  * Random (uniform, no subpleural sparing) = hematogenous
    - miliary TB
    - mets (papillary thyroid, renal)

  * Centrilobular (halo sparing subpleural) = airway centred, usually patchy. Same as constrictive bronchiolitis DDx.
    - infection (TB, fungal) - tree in bud
    - noninfectious - usually no tree in bud. SMOKING AND ASTHMA, others.
      - n: BAC (lepidic spread endobronchial)
      - i: sarcoïd, B.O. post tx
      - in: RB (smokers!), asthma, silicosis (esp acute)
      - al: HP, EG

  * Perilymphatic (periBV and subpleural - no "halo")
    - P edema or lymphangitic carcinomatosis if smooth septal thickening
    - sarcoïd if nodular septal thickening
UPPER LOBE PREDOMINANT INTERSTITIAL NODULES.

(PC) CYSTS (Y sounds like E, for EG; P is silent but deadly) or CASSET (A = ank spond)
PCP, CF, EG, sarcoid, talc, silicosis.

If you must go to basics, it should be ok:
* (I): TB
* (I): sarcoidosis (with hilar nodes), ank spond
* (T): Radiation (for breast, H&N ca, can cause PMF)
* (In) Silicosis - with calcified nodes, PMF; Coal workers Pneumoconiosis - diffuse nodules including some subpleural; Talcosis - with lower lobe emphysemia; preserved lung volumes
* (AI): EG/LCH; maybe eosinophilic pneumonia
* Look for 2’ findings.

PROGRESSIVE MASSIVE FIBROSIS
* bilat upper lobe suprahilar consolidation >1 cm each
* very narrow ddx.

* sarcoild
* silicosis, talcosis, coal workers pneumoconiosis
* maybe on a good day amyloidosis?

BASEAL INTERSTITIAL OPACITIES: USUAL INTERSTITIAL PNEUMONITIS
* “Coarse reticular” on CXR; low lung volumes, probably chronic, would compare to prev
* 5 causes: two blood, two air, and sarcoid. (pretty much on every chest DDX)

* blood (2)
  - connective tissue disease (SLE - effusions, RA - shoulders, nodules, scleroderma - esophagus)
  - drug toxicity (liver hi atten?)
* air (2)
  - asbestososis (pleural plaques)
  - hypersensitivity pneumonitis HP (asthma, g-gl?)
* sarcoild (nodes)
look closely for a more specific septal pattern
- edema or lymphangitic carcinomatosis, sarcoild

HYPERINFLATED LUNGS / CYSTIC DISEASE
* Short but surprisingly tough ddx, esp if young with lower lobe lucency and upper lobe pattern
(Most of “(PC)ESTS” – PCP, CF, EG (or LAM), sarcoild, talc, silosis - the fine print don’t apply)

Diffuse
COPD
LAM (esp if female, pneumothorax or chylous effusion; cysts only, uniform shape, should be diffuse)

Upper lobes, old pt: COPD
Upper lobe nodules and cysts, lucent lower lobes:
(I) PCP especially if HIV positive
(T) talcosis (PMF, granular)
(AI) - EG (M or F, kids too, upper lobe cysts and nodules, bizarre shapes)
(C) CF (!!); still consider LAM

Cystic Lower Lobes
- LiP (2 peaks: child with HIV, 60 F with RA or Sjogrens)
- NF1 (scoliosis, rib abn?)

GROUND GLASS, MOSAIC ATTENUATION

TIGER COUNTRY. WHICH LUNG IS ABNORMAL?
3 possibilities:
* geographic, no septal thickening: the LUCENT is abn, this is air trapping, ask for expiratory scan. Ddx constrictive bronchiolitis (5: smoking/asthma/sarcoild, HP, postinfec like Swyer James)
* geographic, with septal thickening: this is crazy paving. Acute, ddx like consolidation. Chronic, probably alveolar proteinosis, consider BAC/lymph carcin
* hazy edges, no septal thickening: true ground-glass – ddx like consolidation.

AIR TRAPPING
* Dr Barrie’s 5 causes – trapped under the “CHASSis” – c bronch, HP, asthma, smoking, sarcoild
* or if you can’t remember that, causes of constrictive bronchiolitis / BO / air trapping:
(I) post infectious – Swyer James
(N) PTLD – post transplant
(I) inflamm, vascultis, SLE/RA, sarcoild
(T. In) cigarette smoke, asthma, acid, drug toxicity
(AI) HP

CRAZY PAVING: g-gl with septal thickening
Acute: probably ground glass (see below)
Chronic: alveolar proteinosis (may be infected with nocardia), add BAC, lymph carcinomatosis

TRUE GROUND GLASS
* HRCT version of “consolidation” DDX.
* Acute is “IAPH” exactly like consolidation
* Chronic is ‘interstitial pneumonia’ instead of organizing pneumonia

Acute
* infec: PCP in HIV (95%), others CMV, aspergillosis (halo)
* aspiration: dependent areas
* Pulm edema: - cardiogenic with effusions, septal thickening
  - noncardiogenic: (k) toxins hematogenous (drugs) or inhaled (ARDS/AIP), or (d(Pi)) organ failure
* Hemorrhage: (Goodpasture)

Chronic - add interstitial pneumonitis
* infec: PCP in HIV (95%), others CMV, aspergillosis (halo)
* neoplasm: BAC, vascular mets
* inflamm: NSIP (RA, SLE, scleroderma), DIP (smoking)
* not UIP
* trauma: contusion
* inhal: silicosis (acute form)
* allergic: HP ("ground glass nodules")
* vas: hemorrhage - Goodpasture, Wegeners, eosinophilic pneumonia
* cong: alveolar proteinosis (is it actually crazy paving pattern)

PLEURAL BASED MASS
* fluid or solid, and is it actually extrapleural?

* Fluid: loculated effusion, cyst
* Benign solid: lipoma, fibrous tumor
* Malig solid: drop met, mesothelioma

Almost always add to this:
* Extrapleural: herna, paraspinal mass, chest wall mass

FIBROTHORAX - UNILATERAL EXTENSIVE PLEURAL THICKENING
* Infection or bleed (smooth edges, calcified) - esp TB
* Three tumors (lumpy): lung ca mets, thymoma mets, and mesothelioma

UNILATERAL PLEURAL EFFUSION
* exudative most likely
* pus: infection, aspiration
* blood: trauma
* chyle: LAM, postop
* water: CHF (unilat R or bilat)
* sympathetic
  - to pleura: asbestos (L)
  - to abdomen: (L) pancreatitis; hepatic hydrothorax in cirrhosis
  - to connective tissues: SLE, RA (both usu unilateral)
ANTEROIOR MEDIASTINAL MASS
* The obvious medical student differential, limited by age and sex!
* Young woman: teratoma
* Older woman: thymoma or thyroid
* Young man: germ cell tumor or lymphoma

Thyroid: continuous with neck ONLY; usu older pt
Teratoma:
* Young male: malignant germ cell tumor (non- or seminoma; calcifies, but no fat)
* Young female: benign teratoma (calc and fat) - also seen in M

Thymoma:
* Older F: thymoma (calc, no fat) - NOT in males or young pts
* misc: thymolipoma, thymic cyst, rebound hyperplasia

Terrible Lymphoma:
* Hodgkins in young, NHL in old: homog solid noncalciified

MIDDLE MEDIASTINAL MASS
* ...or is it LOBAR COLLAPSE or a PARENCHYMAL MASS?
* Keep it simple, 3 categories.

* Lymph nodes
  - infec
  - inflamm (sarcoid)
  - neoplasm (lung ca, mets, lymphoma)

* Vessels
  - arterial: aneurysm, anomalous
  - venous: obstructed, anomalous

* Congenital cysts
  - bronchogenic, pericardial

POSTERIOR MEDIASTINAL MASS
* ...or is it LOBAR COLLAPSE or a PARENCHYMAL MASS?
* age, and unilat or bilat, vertical or horizontal orientation.
  * paraspinous or the esophagus.

Child: neuroblastoma

Adult:
* Neurogenic tumor
  - nerve sheath (schwannoma, neurofibroma) - round, unilat
  - paraganglioma (ganglioneuroblastoma) - vertical orient

* Other extradural masses, solid and cystic
  - I: Discitis/abscess - bilat, with vertebral changes
  - I: Extramedullary hematopoiesis - bilat, multi level, sclerotic vert
  - Cystic: Dural ectasia, meningocele (NF1)
  - T: hematomata

* Esophagus (don’t forget)
  - enteric cyst
  - hernia, diverticulum
  - dilation (scleroderma air filled, achalasia with AFL)

* Ectopic organs (for bonus points): splenosis, thoracic kidney

ASYMMETRIC LUCENT HEMITHORAX
* go from outside in; the abn lung is the one with abn vasculature.
* remember both the airways and the vessels!

Technical
- rotation (pt turns to his left, L side is more lucent)

Chest Wall
- Poland syn
- mastectomy
- contralateral mass

Pleura
- pneumothorax
- contralateral effusion

Lung
- airways: Swyer James
- vessels: PA stenosis, chronic PE
- parenchyma: cystic lung disease, bullae

OPAQUE HEMITHORAX
* Collapse or pneumonectomy (med shift towards opaque side) - obstructing mass?
* Mass (no med shift, or shift away):
  - parenchymal (abscess, tumor)
  - pleural effusion (exudative ddx)
  - mediastinal (usu post med neurogenic tumor; ‘behind’ the effusion)
  - chest wall (breast, sarcoma, rib lesion)
  - diaphragm hernia or rupture

BRONCHIOECTASIS
* 3 simple categories.

ENDOBRONCHIAL LESION
* basic things and three common tumors

* Infection
  - normal patient with bad bug - TB, MAC, childhood viral (measles)
  - immunocompromised patient - ‘chronic granulomatous disease’, hypogammaglobulinemia

* Bronchial obstruction (usu. focal)
  - congen or childhood: bronch stenosis or atresia (Swyer James)
  - acquired: endobronchial mass or mucus (ABPA), bronchial wall thickening, extrinsic mass

* Congenital bronchial abn (probably diffuse)
  - wall: Mounier Kuhn (...megaly)
  - mucus: CF (big lungs, upper lobe disease)
  - cilia: Kartagener’s (situs inversus), 1' ciliary dyskinesia

TRACHEAL/BRONCHIAL WALL LESION
* is it circumferential thickening or a cartilage lesion?
* “…and 3 rare cartilage lesions, TRACHEa”

* infec: TB, Klebsiella (rhinoscleroma), fungal (mucormycosis, + sinuses)
* neoplasm: SCC or adenoid cystic ca, others rare - mets, melanoma, lymphoma
* inflam: Wegener’s (+ sinuses), sarcoma
* trauma: tracheomalacia (eg. intubation)
* congen “and 3 rare cartilage lesions sparing posterior edges…”: Tracheobronchopathia osteochondroplastica (mult calc nodules), Relapsing polychondritis (+ nose), Amyloidosis.

Foreign body
* Mucus (CF, ABPA)
* Clot
* Infec: papilloma (HPV)

low grade malig: Carcinoid
* true malig: SCC or Adenoid cystic ca (in that order)
* Other rare neoplasms: mets (melanoma), lymphoma, mucoepidermoid ca,