Pneumonia

Pneumonia is a clinical diagnosis: fever, dyspnea, sputum production. Airspace opacities on CXR can be a lot of things (as you know) and some studies say CXR has a 30% false negative rate compared with CT.

Some fun facts on culture data in pneumonia:

- Sputum cultures positive in ~60% (as long as sputum is adequate. 60% of these are strep
- Urine strep antigen positive in 50% of those with confirmed Strep pneumoniae
- Blood cultures positive in only 16%
- Bronchoscopy helpful in about 50% of patient who do not make sputum.

Again… pneumonia is a clinical diagnosis.

So what's up with procalcitonin? You will probably get a question about this on your boards. Know that in a Cochrane meta-analysis use of procalcitonin decreased antibiotic exposure from 8 to 4 days without increase in mortality. Low level supports viral or non-bacterial etiology. Use is not guideline supported however..

Risk Stratification. There are a number of tools out there. You should know the PSI and CURB-65. PSI is the gold standard however it's complicated and needs a calculator.

CURB 65	**30 day Mortality**
C - Confusion	1 = 0.7%
U – Urea (BUN >20)	2 = 2%
R – respiratory rate >30	3 = 9%
B – blood pressure, systolic <90, diastolic <60	4 = 15%
Age > 65 years	5 = 40%

Score of 3 or higher usually merits ICU admission.

Treatment. Note here that treatments are highly influenced by local resistance patterns and the dementia of local antibiotic stewardship programs. In general go for:

Ceftriaxone	P	Azithromcyin	O	Levofloxacin
Cefotaxime	L	clarithromycin	R	moxifloxacin
Ceftaroline	U			
Ertapenem	S			
Amp-Sulbactam				

A note on tigecycline because it may be on your boards. Tigecycline has a black box warning for increased mortality with hospital acquired pneumonia, in particular ventilator associated pneumonia. So only use it if fluoroquinolone or beta-lactam is not an option.

Concern for multidrug resistant Pseudomonas or other MDR GNRs – like CF, bronchiectasis, severe COPD- it is not unreasonable to double up with something like pip/tazo + levofloxacin. Just know that there is absolutely no data to support this practice.

What about steroids? It's kind of controversial but a recent meta-analysis showed a modest mortality benefit in hospitalized patients with more severe pneumonia. If you're going to do it, pick more severely ill patients, be wary of those that may have influenza or Aspergillus, and make a note of risks for adverse events like GI bleeding, neuropsychiatric illness, immunocompromised patients, and pregnant women.

And finally, a note about treatment duration. A meta-analysis of 15 RCTs showed no difference in less than 7 days versus more than 7 days. In fact, in the more than 7 days group there was a signal of harm with increased antibiotic side effects. So, less is more people. Give patients 72 hours to respond to your therapy and if they do, you can stop after another couple of days.

HCAP does not exist anymore because there is no data that nursing home residence, hemodialysis, etc increases the risk for MRSA and Pseudomonas pneumonia. The 2016 HAP/VAP guidelines are on your website for you but are mostly expert consensus-type recommendations.