PNEUMONIA

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Pneumonia
- Infection of the lungs
- Three patterns
  - Lobar
  - Bronchopneumonia
  - Interstitial(atypical)

*Lobar Pneumonia
- Classic form of pneumonia (S. pneumoniae)
- Bacteria acquired in a new nasopharynx >> Aerosolized to alveolus >> Enter alveolar type II cells >> Pneumococci multiply in alveolus >> Invade alveolar epithelium >> Pass from one alveolus to next >> Inflammation/consolidation of lobes
- Can involve entire lung

*Bronchopneumonia
- Patchy inflammation of multiple lobules
- Primary involvement airways and surrounding interstitium
- Staphylococcus aureus

*Interstitial Pneumonia
- Inflammatory infiltrate of alveolar walls only
- More indolent course (benign)
- Viruses
- Legionella pneumophila
- Mycoplasma pneumoniae
- Chlamydophila pneumoniae

-Causes of Pneumonia

Adults:
- S. pneumoniae – most common
- H. influenzae
- Mycoplasma .P
- C. pneumoniae
- Legionella

Children :
- Gram-negative rods >> Klebsiella, E.Coli, Pseudomonas
- S. Aureus (post influenza pneumonia)
- Anaerobes (aspiration PNA; lungabscess)
- Viruses >> Influenza ,RSV

-Signs/Symptoms

High Fever + Cough + Sputum production + Elevated WBC + Pleuritic chest pain

-Diagnosis
- Usually: History >> Physical exam >> X-ray (CTscan)
- Sputum culture
- Bronchoalveolar lavage.

-Clinical Classes of Pneumonia

*Community acquired
- Usually (S.Pneumoniae,H.Influenza,S.Aureus)
- Sometimes Mycoplasma, Chlamydia, Legionella (atypicals)

*Nosocomial
- Bad bugs
- Often gram negatives (Pseudomonas, Klebsiella, E. Coli)
- Hospital Acquired or Ventilator-associated pneumonia (VAP)
- Healthcare-associated pneumonia (HCAP;nursing homes)

===> Legionella

* Symptoms
- Initially mild pneumonia symptoms >> Fever; mild, slightly productive cough
- Can progress to severe pneumonia
- GI symptoms >> Watery diarrhea, nausea, vomiting, and abdominal pain
- Hyponatremia (Na<130 meq/L) common >> confusion

* Treatment: Fluoroquinolone or Azithromycin

===> Mycop lasma Pneumonia
- Atypical pneumonia + Can't see on gram stain
- CXR looks worse than symptoms
- Can cause autoimmune hemolytic anemia >> IgM antibody >> RBC antigen >> "Cold hemolyticanemia"

===> Influenza Virus
- Atypical pneumonia
- Influenza A or B viruses
- Fever, headache, myalgia, and malaise
- Nonproductive cough, sore throat, runny nose
- Major complication is secondary pneumonia
  Strep pneumoniae, Staph aureus, H. influenza

if it's inflammation → pneumonitis ← infx in lung parenchyma

empyema: inflammation of pleural space

- Definition and epidemiology
- Pathophysiology and pathogenesis
- Clinical presentation
- Management :

✓ Investigation

✓ Assessment of severity

✓ Selection of antimicrobial agents

✓ Prevention

- Common causes of pyogenic pneumonia
- Self reading , lung abscess and un-resolving pneumonia

DEFINITION

An inflammatory process resulting from infection of the lung parenchyma by pathogenic microorganisms and usually associated with radiological evidence on CXR

1. ✓ Community acquired pneumonia (CAP)
2. ✓ Hospital acquired pneumonia (HAP)
3. ✓ Ventilator associated pneumonia (VAP)

→ Nosocomial (severe)

→ types of organisms are different

→ So we use different Abx

✓ The term Health care associated pneumonia(HCAP) is no longer exist with most recent HAP&VAP guidelines (ATS 2016)

4. Atypical pneumonea : different organism (Mycoplasma.P, Legionella.P) (Chlamydophila.P) + diffirent imaging (Bilateral infeltrate) + Dx → pt come with extra pulmonary manifistations + Different & Difficult culturing + Atypical Treatment

- The true incidence of CAP is uncertain because the illness

is not reportable and only 20% to 50% of patients require

hospitalization.

- Estimates of the incidence of CAP range from 2 to 15 cases per 1000 persons per year, with substantially higher rates in older adults.

- Pneumonia affects approximately 450 million people globally (7% of the population) and results in about 4 million deaths per year.

- 7th leading cause of death in the U.S

PATHOLOGY AND PATHOGENESIS

① Aspiration of oropharyngeal or nasopharyngeal secretions is the main mechanism of contamination of lower airways by bacteria.

→ Micro ⇒ Immune system can overcome it
→ Maero ⇒ may overcome Immune system

- The oropharynx of healthy individuals is colonized by diverse microorganisms that vary in their potential virulence.

- For example, Streptococcus pneumoniae, which contains multiple adhesions, binds to the receptor for platelet-activating factor on epithelial cells.

- Other pathogens enter the lower respiratory tract by ② inhalation.

③ + hematogenous spread

④ + By lymph nodes (TB)

- This interaction is enhanced by cigarette smoke, infection with respiratory viruses, and particulate air pollutants.

- Several mechanisms in the airways prevent adherence and colonization by potential bacterial pathogens:

✓Epithelial cells synthesize and secrete peptides, termed defensins and cathelicidins, that possess broad spectrum antimicrobial activity.

✓Pulmonary surfactant proteins A and C can inhibit bacterial binding to host cells and also promote phagocytosis of selected bacteria.

✓The presence of complement and immunoglobulins (particularly immunoglobulin A [IgA])

- Interactions between the virulence and quantity of aspirated or inhaled microorganisms and the individual's innate and adaptive immune responses determine whether pneumonia develops.

- Age , smoking , alcohol and comorbidity (resp. and non resp) all these factors increase risk of pneumonia.

- Geographic factors, seasonal timing, travel history, and occupational or unusual exposures modify the risk of various microbial aetiologies of CAP.

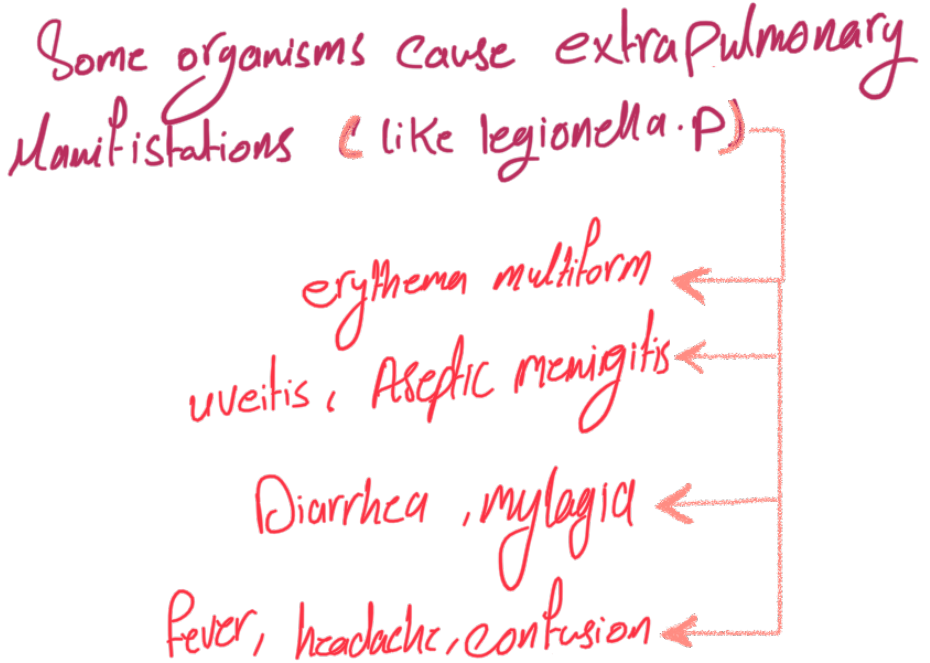
CLINICAL PRESENTATION

Pneumonia is characterized by the presence of:

fever, altered general well-being,

respiratory symptoms:

- ✓ cough (90%)
- ✓ sputum production (66%)
- ✓ dyspnea (66%)
- ✓ pleuritic pain (50%)
- ✓ hemoptysis (15%).



In older and immunocompromised patients, the signs and symptoms of pulmonary infection may be muted and overshadowed by nonspecific complaints. other systems, like GI

On physical examination : Consolidation(pneumonia),Increased fremitus on affected side ;Dullness ;Bronchial breath sounds; bronchophony; crackles. + fever + taechycardic

Or may complicated by parapneumonic effusion and they signs will be different .

INVESTIGATION

- Radiological: CXR , Computed tomography (CT)
  - leukocytosis, segmented PMN → Bacterial
  - leukopenia, lymphopenia → virus cause
  - + ↑ platelet → stress state as in infx
  - + Hb → Anemia → Mycoplasma.P
- Labs: blood cell counts, serum glucose, electrolyte measurements, pulse oximetry or ABG , C-reactive protein(CRP), Procalcitonin(PCT)
  - For daily checks
  - + ESR → ↑ in inflammation statuse
  - Procalcitonin → ↑ in Bacterial infx , Better for daily checks
- Microbiological: sputum culture (40%), blood culture(20%).
- Invasive: pleural tap(pleural fluid culture less commonly involved pleura). Bronchoscopy (specific indication, qualitative &quantitative cultures)

+ Liver function test (LFT)
  Kidney function test (KFT)
  → why we order them
  - to tell us that at some point we should start Tx
  - extrapulmonary manifestations → hypo
    can affect them (hyponatremia, ↑ liver enzyme
    regi

- Antigen detection and serology markers (→ Antibodies):

✓ The sensitivity of S. pneumoniae urinary antigen detection is 50% to 80% and the specificity is 90%.However, antigen test may also be applied on pleural fluid with a sensitivity and specificity of almost 100%

✓ For L. pneumophila serogroup1, the sensitivity is 60% to 80%, and the specificity is greater than 95%. Only testing serogroup 1!!

✓ Antigens for the many common respiratory viruses, influenza virus, respiratory syncytial virus, adenovirus, and parainfluenza viruses can be detected by direct immunofluorescence or by enzyme-linked immunoassay.

- ✓ Some pathogens should be detected by nucleic acid amplification (PCR) tests because culture procedures for viruses and fastidious bacteria(M.pneumoniae, C. pneumoniae, L. pneumophila, and Bordetella pertussis) is difficult.

- ✓ Serology test used to be done to establish a microbiologic diagnosis for pneumonia caused by pathogens that cannot be readily cultured.(not indicated nowadays)

Imaging
- Radiological abnormalities
  - Consolidations
    - Lung parenchyma are inflammed, Alveoli are full of pus & fluid
      - ⇒ appears dense white area
    - The most common cause of consolidation is pneumonia (classic.P)
  - Dense white area & you can't see the underlying lung tissue.
    - .... inside it you can see Black lines, called "Air Bronchograms" → which are air inside bronchi
- Bad picture with Bilateral infeltrations ⇒ But pt look normal → Atypical organisms (Atypical.P)
  - "Walk pneumonea"

Treatment ① risk stratify pt ② Abx ③ treat complications

critirca not required

قسم جزء

ASSESSMENT OF SEVERITY

CURB 65

PSI

* complications

→ RS:
Abscess, effusion, empysema, RF, ARDS

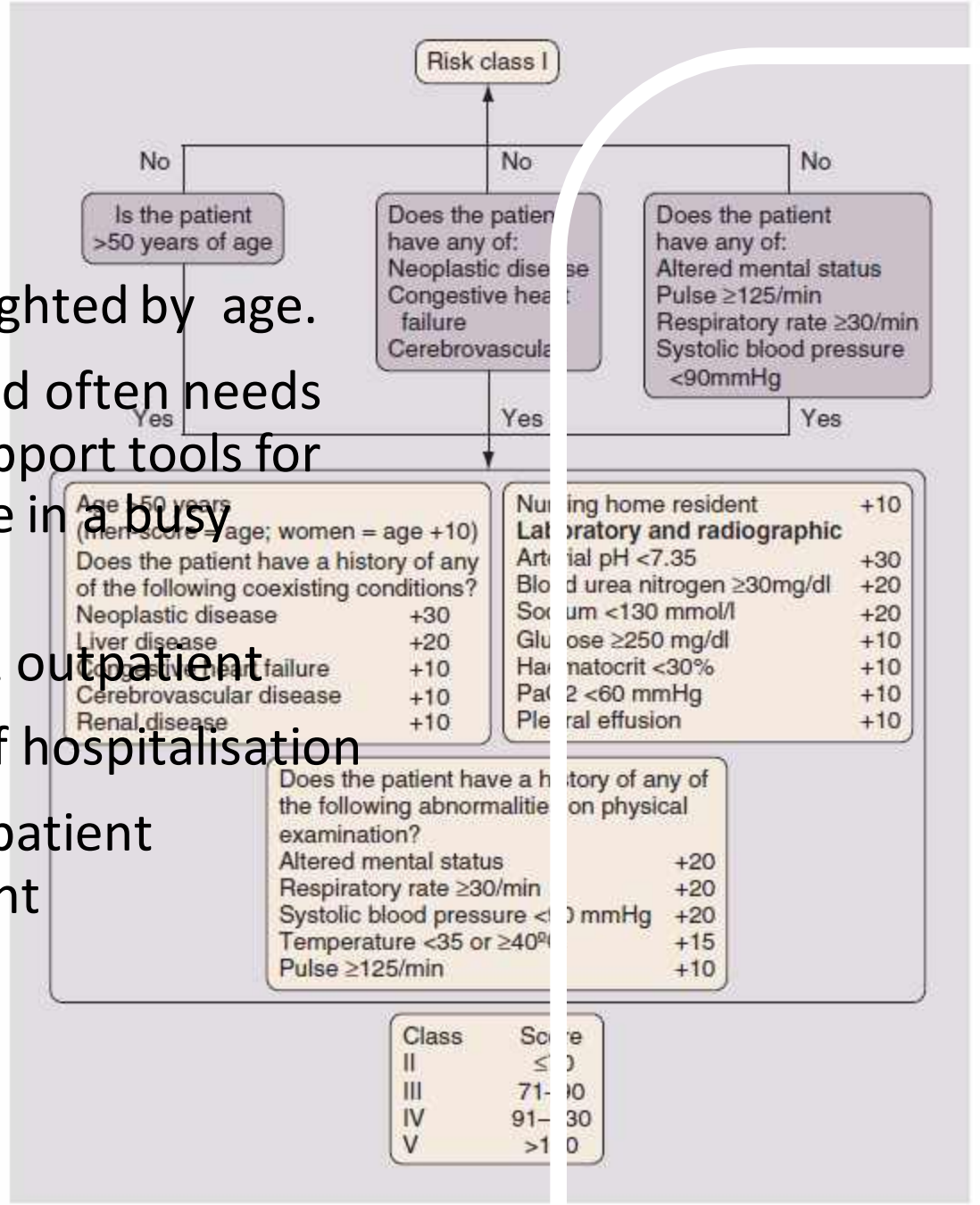
→ CVS: → MCC of Death
Acs, HF, Arrythmias

→ Renal.S:
AKI, AKF

→ CNS:
Delirum, stroke, Dementia

→ ES:
hypoglycemia & hyper.g

→ Hematological :
leukopenia, Thrombocytopenia,
Thrombocytosis, coa ulation Alterations



- Heavily weighted by age.
- Complex and often needs decision support tools for efficient use in a busy emergency.

✓ Class 1and2 outpatient

✓ Class 3 brief hospitalisation

✓ Class 4,5 inpatient management

CURB 65

- Easy to use in busy E.D
- ✓ Non severe :outpatient
- ✓ Intermediate: close out or brief inpatient
- ✓ Severe: inpatient (4,5 consider ICU)

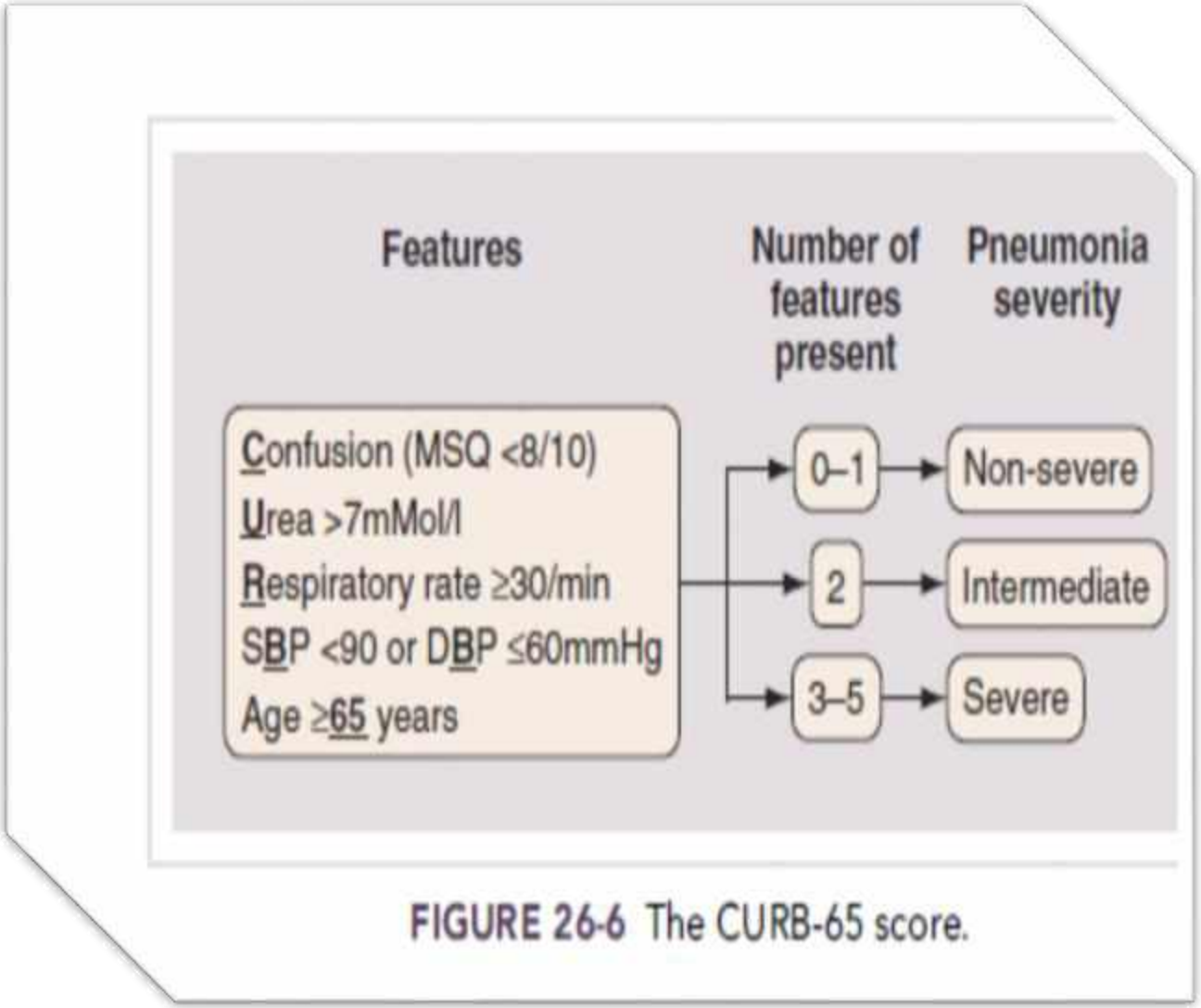


FIGURE 26-6 The CURB-65 score.

- Both are not sensitive to logistic and social issues such as reliability of oral intake, including antibiotics, and home support.

- Neither PSI nor CURB-65 are accurate for determining need for ICU care in patients without an obvious indication such as the need for mechanical ventilation or vasopressor support while still in the emergency department.

- Patients initially admitted to a general floor with subsequent transfer to the ICU have higher mortality than patients with equivalent severity of illness admitted directly to the ICU.

Criteria to Consider Admission to an Intensive Care Unit for Patients with Community-Acquired Pneumonia without Shock or Respiratory Failure

Respiratory rate > 30 breaths/min
PaO2/FIO2 ratio < 250 or arterial saturation ≤90% on room air
Multilobar or bilateral radiographic involvement or pleural effusion
Confusion or disorientation
Uremia (BUN level > 20 mg/dL)
Leukopenia (WBC count < 4000 cells/dL) or extreme leucocytosis >20,000 cells/dL
Thrombocytopenia (platelet count < 100,000 cells/dL
Hypothermia (core temperature < 36° C
Hypotension requiring aggressive fluid resuscitation
Acidosis (pH < 7.30)
Hypoalbuminemia (albumin < 3.5 g/dL)
Hyponatremia (sodium < 130 mEq/L)
Tachycardia (>125/min)

18-gauge needle in the chest wall. It carries a risk of pneumothorax and lung hemorrhage, and it cannot be recommended other than for research purposes in the hands of those experienced in the technique.

Open Lung Biopsy. The value of open lung biopsy has not been systematically evaluated because of the potential risks. Anecdotally, it has helped in all three types of pneumonia when the patient has failed to respond to empirical therapy and when other tests have been unhelpful.

Other Techniques

Molecular biologic methods, especially polymerase chain reaction (PCR), are beginning to be used selectively for pathogen identification. The potential of this technique lies in its exquisite sensitivity; the test can detect the DNA of a single microorganism. This may also limit its potential, however, because the separation of commensal organisms from pathogens may not be possible. In the respiratory tract it is beginning to be used to detect noncommensal organisms such as viruses and fungi in respiratory samples and commensal organisms in normally sterile sites (e.g., blood, pleural fluid). Its other roles may be to detect multiple organisms at the same time in a single sample (so-called multiplex PCR) and to identify antibiotic resistance by detection of the specific gene defect that determines such resistance (e.g., rifampicin resistance in tuberculosis).

There is also interest in "near-patient" tests that rely on antigen or nucleic acid detection, usually with a colorimetric

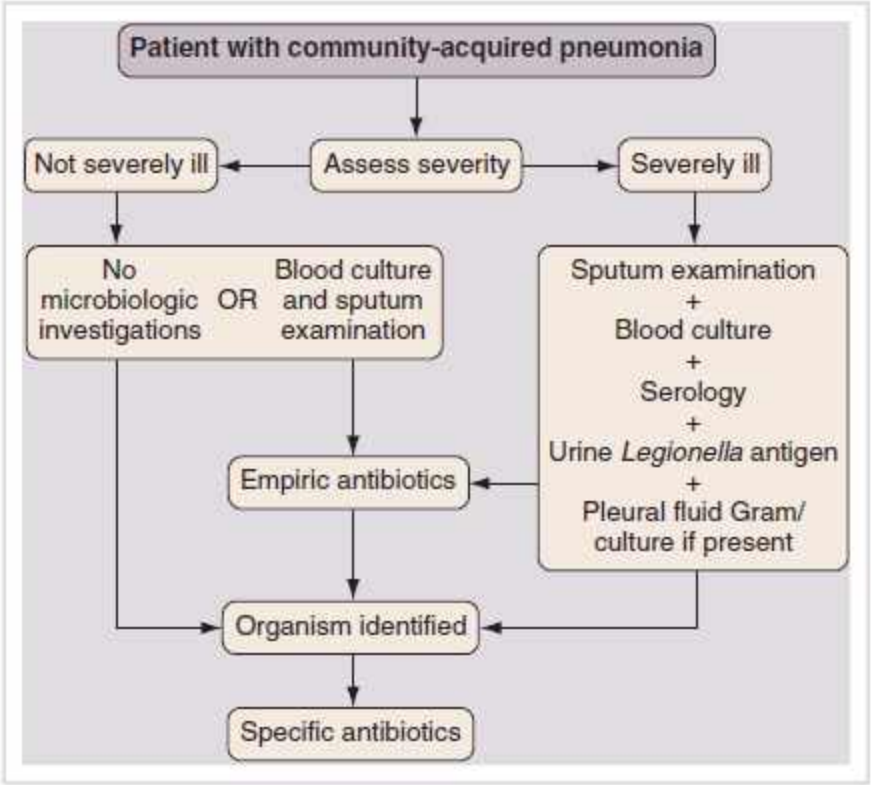


FIGURE 26-9 Diagnostic approach to the patient who has community-acquired pneumonia (CAP). A suggested algorithm to guide microbial investigation in CAP.

2

SELECTION OF ANTIMICROBIAL AGENTS

- Whenever possible, treatment for pneumonia should use the antibiotic with the narrowest spectrum possible, selected on the basis of the underlying pathogen .

- Pathogens are rarely identified at the time of presentation, especially when pneumonia is managed in the outpatient setting .

- Because optimal outcomes are associated with a rapid initiation of antibiotics, initial treatment for patients with pneumonia must be empirical

Atypicals
- Fluoroquinolones
  - levofloxacin
- Macroloids
  - Azithromycin
- Doxyclycine

Nosocomial
MRSA ⇒ (post Flu)
- Vancomycine
- Linezolid

⇒ if week as in CAP
- Doxycycline, clindamycine, Bactrim

Anerobic / Aspiration.P or Abscess
- Metranidazole
- Clindamycin
- B-lactamase inhibitors
- Monobactams
- Pencillins

See the table in last slide

Common Causes of Community-Acquired Pneumonia in Patients Who Do Not Require Hospitalization*

Mycoplasma pneumoniae

Streptococcus pneumoniae

Chlamydophila pneumoniae

Haemophilus influenzae

Respiratory viruses

Common Causes of Community-Acquired Pneumonia in Patients Who Require Hospitalization

Streptococcus pneumoniae
Mycoplasma pneumoniae
Chlamydophila pneumoniae
Haemophilus influenzae
Staphylococcus aureus
Mixed infections
Enteric gram-negative bacilli
Aspiration (anaerobes)
Respiratory viruses
Legionella species

Common Causes of Severe Community-Acquired Pneumonia

Streptococcus pneumoniae
Enteric gram-negative bacilli
Staphylococcus aureus
Legionella species
Mycoplasma pneumoniae
Respiratory viruses
Pseudomonas aeruginosa (relative frequency determined by the presence or absence of specific risk factors)

TABLE 2 Epidemiological Conditions Related to Specific Pathogens in Patients with Community-Acquired Pneumonia

Condition	Commonly Encountered Pathogen(s)
Elderly	*S. pneumoniae*, gram-negative bacilli, *H. influenzae*, *Staphylococcus aureus*, anaerobes, *Pseudomonas aeruginosa*, and *Legionella* species
Alcoholism	*Streptococcus pneumoniae* and anaerobes
COPD and/or smoking	*S. pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Legionella* species, *Pseudomonas aeruginosa*
Nursing home residency	*S. pneumoniae*, gram-negative bacilli, *H. influenzae*, *Staphylococcus aureus*, anaerobes, *Chlamydia pneumoniae*
Poor dental hygiene	Anaerobes
HIV infection—early stage	*S. pneumoniae*, *H. influenzae*, and *Mycobacterium tuberculosis*
HIV infection—late stage	*S. pneumoniae*, *H. influenzae*, *Pseudonomas aeruginosa*, *Mycobacterium tuberculosis* *P. carinii*, *Cryptococcus*, *Histoplasma* species and *Aspergillus* species
Influenza active in community	Influenza, *S. pneumoniae*, *S. aureus*, *Streptococcus pyogenes*, and *H. influenzae*
Conditions that predispose to aspiration pneumonias (see Table 27-1)	Anaerobes
Structural disease of lung (bronchiectasis, cystic fibrosis, etc.)—early stage	*S. pneumoniae*, *S. aureus*, and *H. influenzae*
Structural disease of lung (bronchiectasis, cystic fibrosis, etc.)—late stage	*Pseudonomas aeruginosa*, *Burkholderia (Pseudomonas) cepacia*, *S. aureus*, and *Aspergillus* sp.
Injection drug use	*S. aureus*, anaerobes, *M. tuberculosis*, and *S. pneumoniae*
Airway obstruction	Anaerobes, *S. pneumoniae*, *H. influenzae*, and *S. aureus*
Travel to southwestern U.S.	*Coccidioides* species
Exposure to farm animals or parturient cats	*Coxiella burnetii* (Q fever)
Exposure to cooling towers, large air-conditioning systems, spas, hot tubs, humidifiers	*Legionella* species
Exposure to bats or soil enriched with bird droppings	*Histoplasma capsulatum*
Exposure to birds	*Chlamydia psittaci*
Exposure to poultry farm in area with previous H5N1 infection	*Influenzae H5N1*
Exposure to rabbits	*Francisella tularensis*

Common pathogens for HAP

setting	pathogen
2 TO 5 DAYS IN HOSPITAL Mild to moderate pneumonia Severe pneumonia “low-risk”	Enterobacteriaceae Streptococcus pneumoniae Haemophilus influenza Methicillin-sensitive Staphylococcus
≥5 DAYS IN HOSPITAL Mild to moderate pneumonia	as above
≥5 DAYS IN HOSPITAL Severe HAP “low risk”	Pseudomonas aeruginosa Enterobacter spp. Acinetobacter spp.
≥2 DAYS IN HOSPITAL Severe HAP “high risk”	as above
Recent abdominal surgery or witnessed aspiration	Anaerobes

HIGH RISK GROUP

Age older than 65 years

Pancreatitis

Chronic obstructive pulmonary disease

Central nervous system dysfunction (stroke, drug overdose, coma, status epilepticus)

Congestive heart failure

Malnutrition

Diabetes mellitus

Endotracheal intubation

Renal failure

Complicated thoracoabdominal surgery

Alcoholism

Common pathogens for VAP

Pseudomonas
S. aureus(MRSA 56%)
Enterobacteriacea
Haemophilus spp.
Streptococcus spp.
Acinetobacter spp.
S. pneumoniae
Neisseria spp.
S. Maltophilia

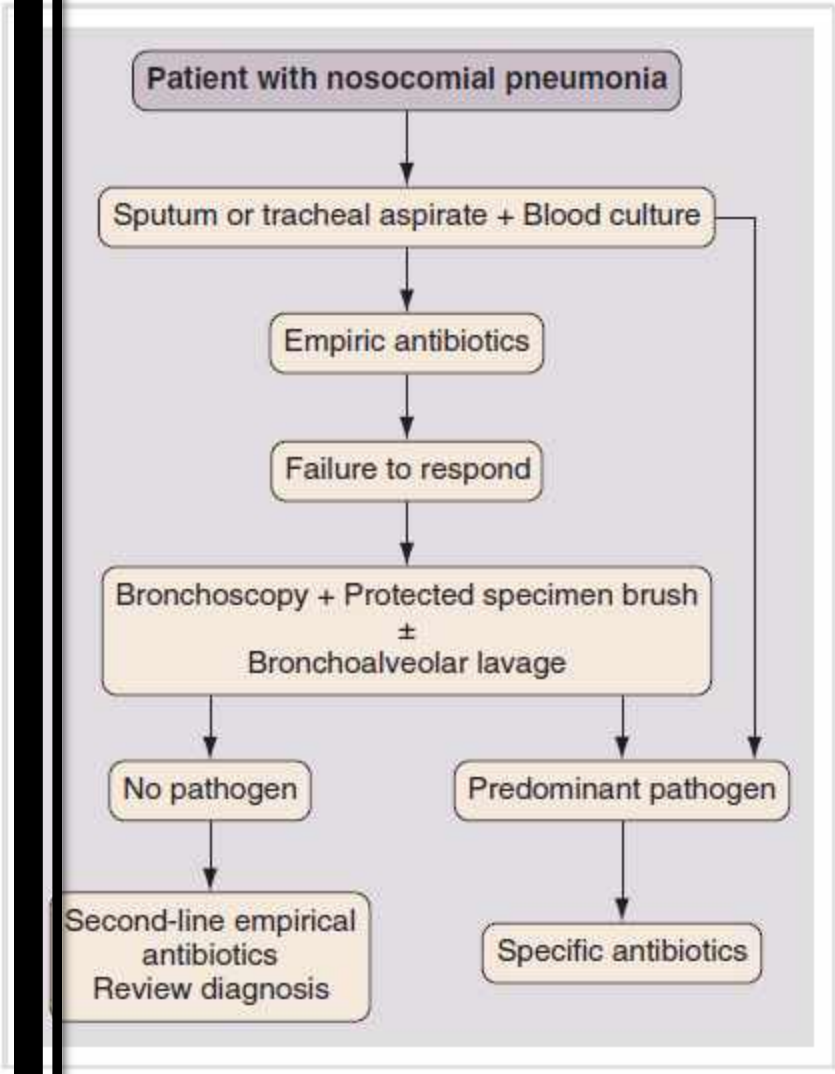


FIGURE 26-10 Diagnostic approach to the patient who has nosocomial pneumonia (NP). A suggested algorithm to guide microbial investigation in NP.

Pitfalls and Controversies

Pitfalls

1. The symptoms and physical signs of respiratory infection are shared with other respiratory tract diseases.
2. The elderly, the very young, and the immunosuppressed may not manifest typical features of respiratory infection.
3. Bacteria present in respiratory secretions may be commensal rather than pathogenic.
4. Pneumococcal respiratory infections may usually still be treated by antibiotics to which a bacterium is resistant *in vitro* if used in an appropriate dose.

Controversies

1. Pneumonia cannot be diagnosed without a chest radiograph.
2. The distinction between typical and atypical pneumonias is clinically accurate and useful.
3. Routine sputum examination is useful in CAP.
4. Bronchoscopic sampling is useful in NP.

SUGGESTED READINGS

American Thoracic Society: Infectious Diseases Society of America guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. Am J Respir Crit Care Med 2005; 171(4):388–416. www.thoracic.org.

Bartlett JG, Dowell SF, Mandell LA, *et al:* Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. Clin Infect Dis 2000; 31:347–382.

BTS Guidelines for the Management of Community Acquired Pneumonia in Adults. Thorax 2001; 56(suppl 4):IV1–IV64. www.brit-thoracic.org.

Mandell LA, Bartlett JG, Dowell SF, File TM Jr, Musher DM, Whitney C;

Recommended empirical antibiotics for community acquired pneumonia

Outpatient treatment

1. Previously healthy and no use of antimicrobials within the previous 3 months

A macrolide (strong recommendation; level I evidence)
Doxycyline (weak recommendation; level III evidence)

2. Presence of comorbidities or use of antimicrobials within the previous 3 months (in which case an alternative from a different class should be selected)

A respiratory fluoroquinolone (moxifloxacin, gemifloxacin, levofloxacin [750 mg]) (strong recommendation)

or

A b-lactam plus a macrolide (strong recommendation)

3. In regions with a high rate (>25%) of infection with high-level (MIC >6 mg/mL) macrolide-resistant Streptococcus pneumoniae, consider use of alternative agents listed above in (2) for patients without comorbidities (moderate recommendation;level III evidence)

Inpatients, ICU treatment

A b-lactam (cefotaxime, ceftriaxone, or ampicillin-sulbactam)
plus either azithromycin (level II evidence) or
a respiratory fluoroquinolone (level I evidence) (strong recommendation)
(for penicillin-allergic patients, a respiratory fluoroquinolone
and aztreonam are recommended)

If Pseudomonas is a consideration

An antipneumococcal, antipseudomonal b-lactam (piperacillintazobactam,
cefepime, imipenem, or meropenem) plus either ciprofloxacin or levofloxacin (750 mg)

or

The above b-lactam plus an aminoglycoside and azithromycin

or

The above b-lactam plus an aminoglycoside and an antipneumococcal
fluoroquinolone (for penicillin-allergic patients,
substitute aztreonam for above b-lactam)
(moderate recommendation; level III evidence)

If CA-MRSA is a consideration, add vancomycin or linezolid
(moderate recommendation; level III evidence)

NOTE. CA-MRSA, community-acquired methicillin-resistant Staphylococcus

RECOMMENDED INITIAL EMPIRIC ANTIBIOTIC THERAPY FOR HOSPITAL-ACQUIRED PNEUMONIA (NON-VENTILATOR-ASSOCIATED PNEUMONIA)

Not at High Risk of Mortality and no Factors Increasing the Likelihood of MRSA	Not at High Risk of Mortality but With Factors Increasing the Likelihood of MRSA	High Risk of Mortality or Receipt of Intravenous Antibiotics During the Prior 90
Piperacillin-tazobactam Or Cefepime Or Levofloxacin Or Imipenem Or Meropenem	Piperacillin-tazobactam Or Cefepime or ceftazidime Or Levofloxacin Or Imipenem Or Meropenem Or Aztreonam Plus Vancomycin Or Linezolid	Two of the following avoid 2B-lactams: Piperacillin-tazobactam Or Cefepime or ceftazidime Or Levofloxacin Or Imipenem Or Meropenem Or Aztreonam Or Aminoglycoside Plus Vancomycin Or

SUGGESTED EMPIRIC TREATMENT OPTIONS FOR CLINICALLY SUSPECTED VAP IN UNITS WHERE EMPIRIC MRSA COVERAGE AND DOUBLE ANTIPSEUDOMONAL/GRAM-NEGATIVE COVERAGE ARE APPROPRIATE

CHOOSE ONE GRAM-POSITIVE OPTION FROM COLUMN **A**, ONE GRAM-NEGATIVE OPTION FROM COLUMN **B**, AND ONE GRAM-NEGATIVE OPTION FROM COLUMN **C**

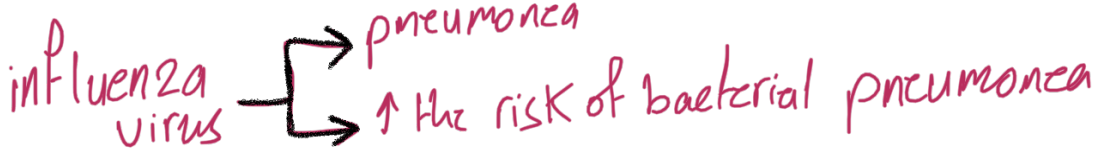
A. Gram-Positive Antibiotics With MRSA Activity	**B. Gram-Negative Antibiotics With Antipseudomonal Activity: β-Lactam–Based Agents**	**C. Gram-Negative Antibiotics With Antipseudomonal Activity: Non-β-Lactam–Based Agents**
Vancomycin	Piperacillin-tazobactam	Ciprofloxacin, Levofloxacin
Or	Or	Or
Linezolid	Cefepime , Ceftazidime	Aminoglycosides
	Or	Or
	Imipenem , Meropenem	Polymyxins: Colistin
	Or	
	Monobactam: Aztreonam	

PREVENTION OF PNEUMONIA

1

Vaccine :

- influenza vaccine

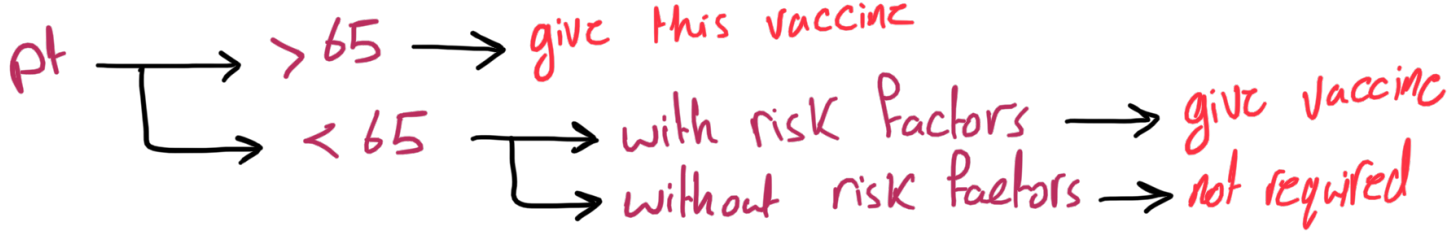


✓ Inactivated influenza vaccination is recommended annually for all persons aged 6 months and older, including pregnant women.

✓ The optimal period for vaccination is October to November. However, it is acceptable to provide vaccine from September to early march.

❖ pneumococcal vaccine

✓The purified polysaccharide vaccine (PPSV23) contains capsular antigens isolated from 23 of the most prevalent capsule types and is immunogenic in adults.



✓The pneumococcal conjugate vaccine (PCV13) contains the polysaccharide antigens from 13 of the most prevalent capsule types, conjugated to a nontoxic mutant of diphtheria toxin protein, which generates T-cell help and long lived memory B cells specific for the pneumococcal antigens.

Corona Vaccine

- ✓In 2014, the updated older Advisory Committee on Immunization Practices (ACIP). recommendations are that both PCV13 and PPSV23 should be administered in series to all adults 65 years of age.

- ✓ patients 19 to 64 years of age with chronic conditions that increase the risk of invasive pneumococcal infection (e.g., diabetes mellitus, chronic lung,heart, or liver disease; cigarette smoking or alcoholism).

2

Smoking cessation: → ↑ Risk & Severity of pneumonia & other infx

- ✓ Not only is smoking a risk factor for pneumococcal disease, but also quitting smoking reduces the risk.

- ✓ The IDSA/ATS recommend smoking cessation counselling as well as pneumococcal vaccination for smokers who are hospitalized with pneumonia.

STREPTOCCOCUS PNEUMONIA

- S. pneumoniae is the most common bacterium isolated from patients with CAP.

- Classically, the onset is abrupt, characterized by intense and prolonged chills and considerable thoracic pain .

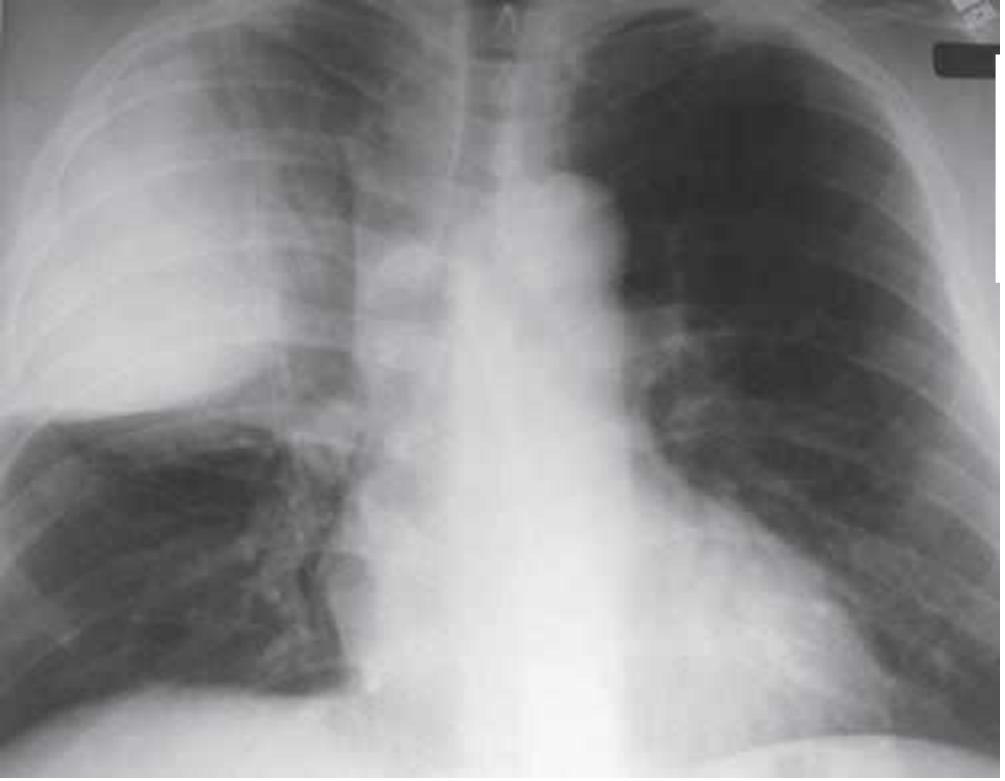
- Symptoms are rapidly progressive, with fever close to 40C (104F), tachycardia, and tachypnea; cough is common, as are oliguria and cyanosis

- Nasolabial herpes simplex lesion may develop, crackles are heard, and chest radiographs show homogeneous lobar or segmental consolidation .

- Leucocytosis is frequent, and blood cultures are positive in 10–20% of patients if these are obtained before antibiotic therapy.

- Radiologic and physical signs characteristically improve rapidly and considerably with treatment .

- High risk of secondary complications (e.g., empyema, meningitis, septicemia)



FRONTAL CHEST
RADIOGRAPH SHOWS HOMOGENEOUS INCREASED OPACITY CONFORMING TO THE SHAPE OF THE RIGHT UPPER LOBE, EXTENDING TO THE PLEURAL SURFACES, ASSOCIATED WITH AIR BRONCHOGRAMS

MYCOPLASMA PNEUMONIAE

- Usually occur in small epidemics, particularly in closed populations.

- A history of a preceding upper respiratory tract infection may be found in up to 50% of patients.

- Progressive onset, fever without chills, dry cough, headache, myalgia, diffuse crackles, modest leukocytosis, interstitial infiltrates on chest radiograph(atypical presentation)

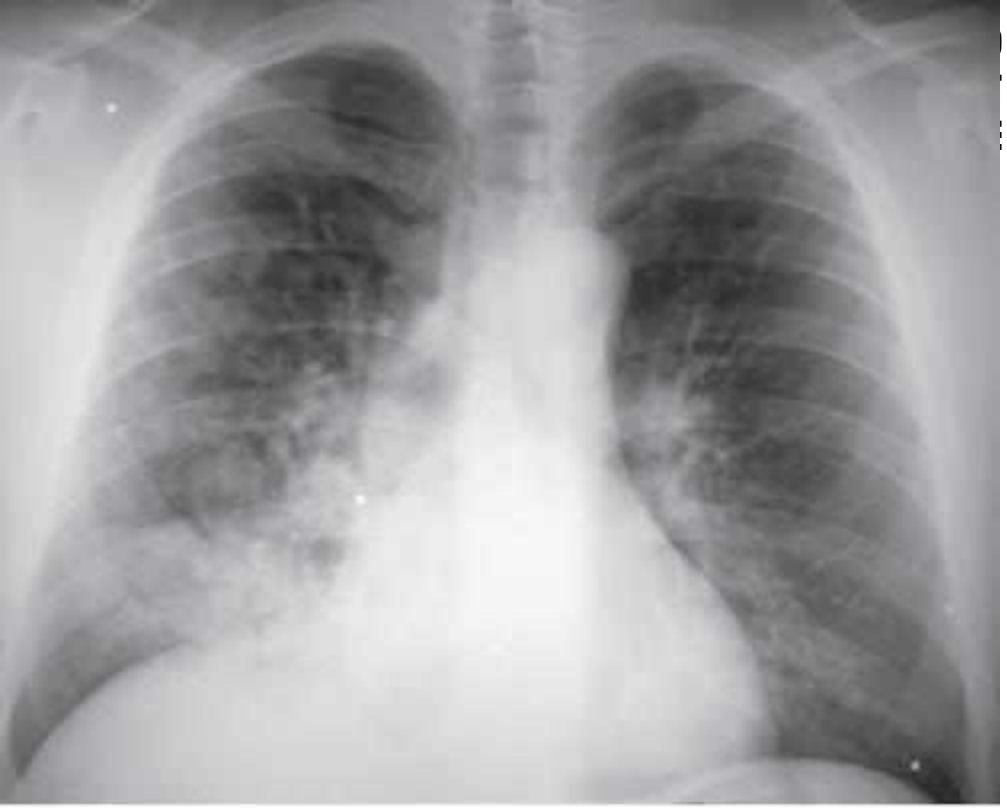
- The presentation of viral respiratory infections, but the incubation period is longer (10–20 days) than for viruses, and the fever is generally below 39C.

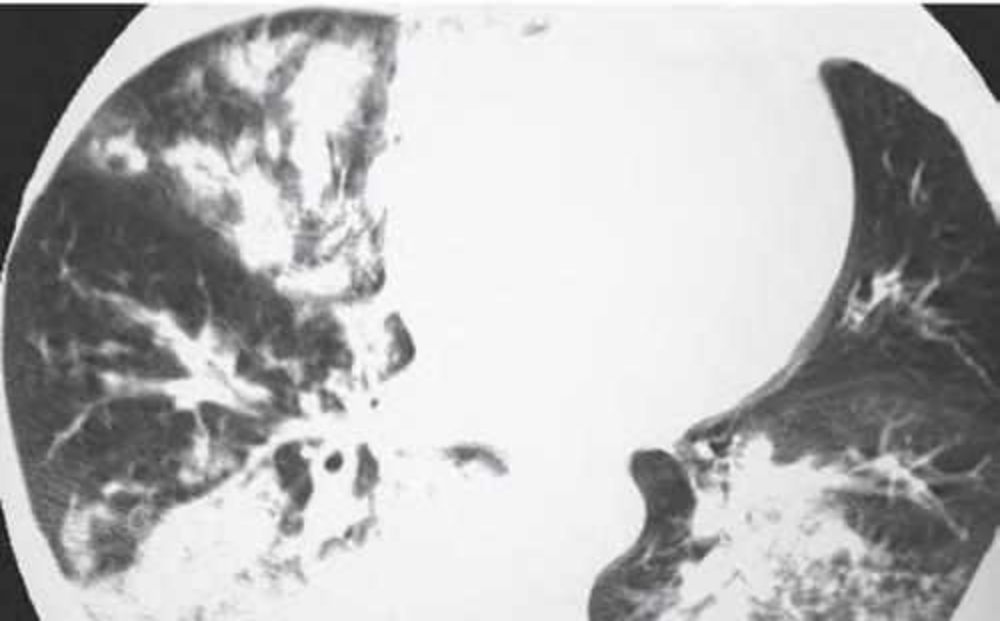
- Within a few days, most symptoms improve, although the low-grade fever and cough frequently persist.

- Variety of extr-apulmonary manifestations may be encountered, including arthralgia, cervical lymphadenopathy, bullous myringitis, diarrhea, immune hemolytic anemia, meningitis ,meningoencephalitis , myalgia, myocarditis, hepatitis ,nausea, pericarditis, skin eruptions, and vomiting.

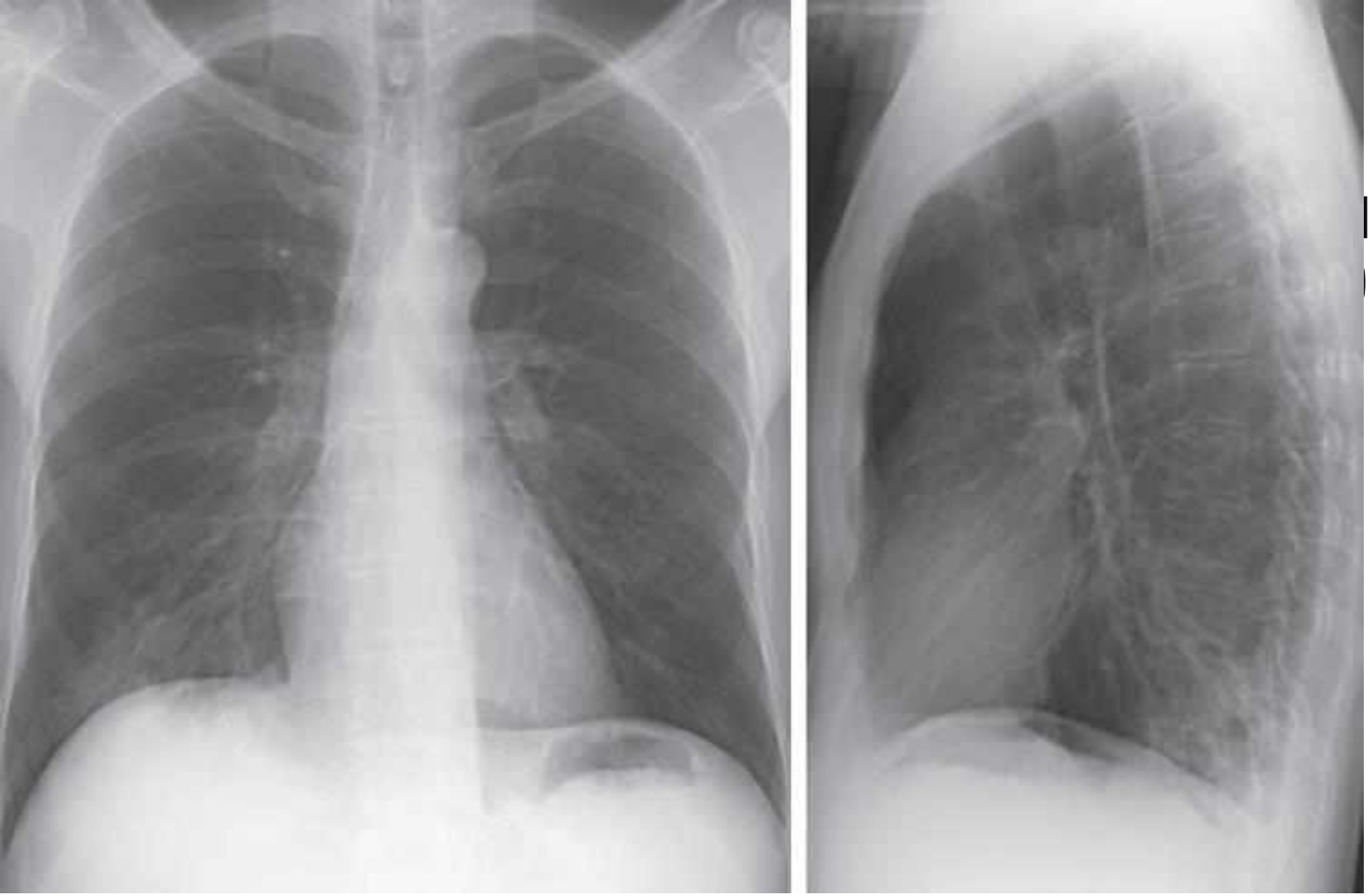
Diffuse crackles are occasionally heard. Infiltrates are usually localized in the lower lobes and regress very slowly over 4–6 weeks.

Pleural effusions and mediastinal lymphadenopathy are rare





FRONTAL CHEST RADIOGRAPH SHOWS RIGHT LOWER LOBE CONSOLIDATION ASSOCIATED WITH SEVERAL SMALL NODULAR OPACITIES , THE LATTER CONSISTENT WITH “ACINAR” OR “AIR SPACE” NODULES



Y RIGHT LOWER LOBE
NIA

MYCOPLASMA PNEUMONIAE PNEUMONIA SHOW PATCHY RIGHT LOWER LOBE CONSOLIDATION CONSISTENT WITH BRONCHOPNEUMONIA

LEGIONELLA PNEUMOPHILA

- Gram-negative intracellular bacilli; approximately 30 species have been identified, the most common being L. pneumophila.

- Water and air-conditioning systems are their natural reservoirs.

- Spreading of the bacilli occurs by air, but no transmission between human beings has been reported.

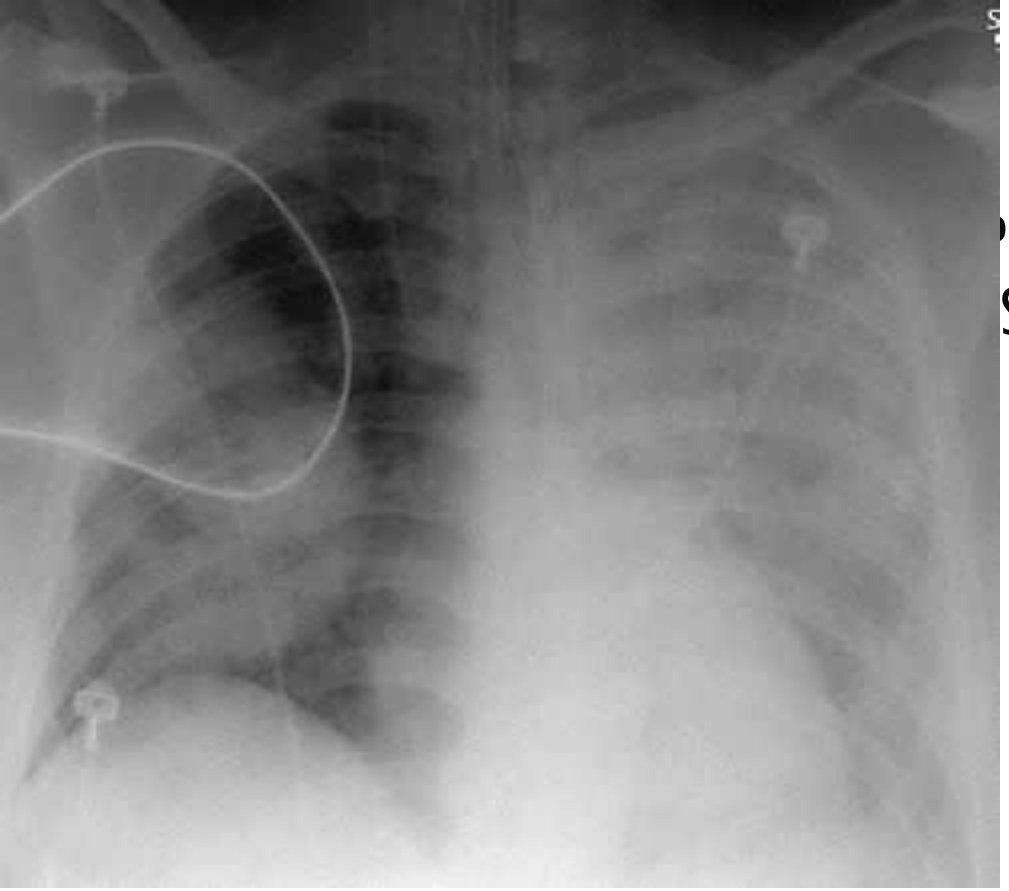
- After 2–8 days of incubation, headache, myalgia, high fever, and chills precede pneumonia by a few days
- Pneumonia occurs either sporadically or in small epidemics and is more likely to occur in immunocompromised hosts
- Dyspnea, hemoptysis, and chest pain frequently occur.

- Extra-pulmonary symptoms and signs are numerous and include abdominal pain, agitation, watery diarrhoea, arthralgia, confusion, skin rash, headache, haematuria, hyponatremia, hypophosphatemia, myalgia, nausea, oliguria, proteinuria, renal failure, seizures, splenomegaly, and vomiting.

- Leucocytosis , neutropenia, lymphopenia, and hepatic inflammation may be observed.

- Pleural effusion is frequently present; cavitation is rare.

- The outcome depends on the early clinical recognition and treatment and on comorbidities.



PH IN A PATIENT WITH LEGIONELLA PNEUMONIA
SHOWS LEFT-GREATER-THAN-RIGHT MULTILOBAR
CONSOLIDATION

FRONTAL CHEST RADIOGRAPH IN A PATIENT WITH LEGIONELLA PNEUMONIA AND RESPIRATORY FAILURE SHOWS LEFT-GREATER-THAN-RIGHT MULTILOBAR CONSOLIDATION

GRAM-NEGATIVE BACILLI

- More often responsible for nosocomial pneumonia than for CAP, but CAP attributable to these agents may result from their colonization of the oropharynx followed by inhalation or microaspiration of the organisms.

- The clinical presentation is that of a typical pneumonia and the prognosis is poor, particularly in cases of immuno-depression, alcoholism, neutropenia, and old age.

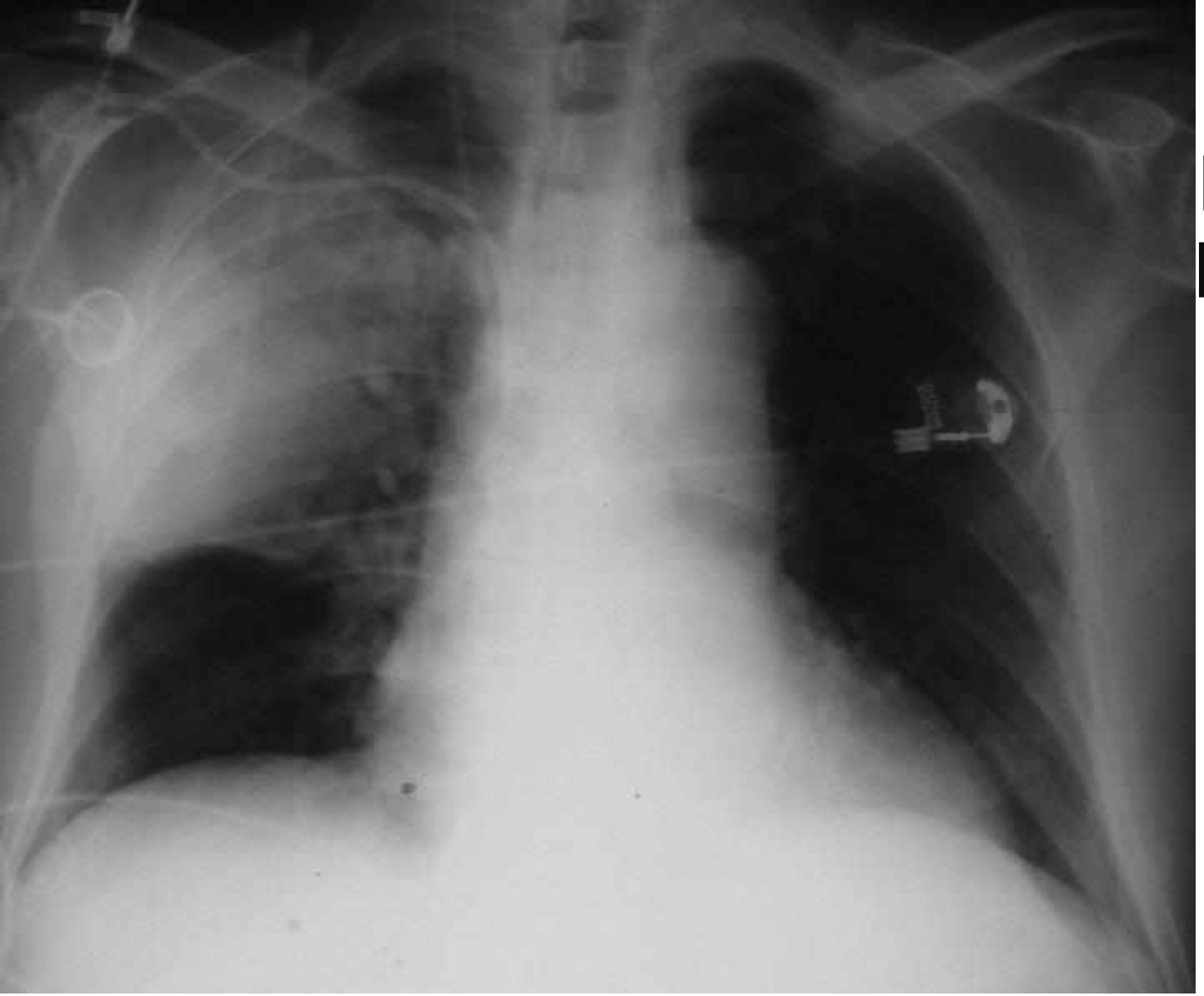
pt with Risk factors

K. pneumoniae:

- ✓ Typically occurs in men older than 40 years; alcoholism, diabetes mellitus,and chronic lung disease are predisposing factors.

- ✓ Patients were thought to produce particularly large volumes of thick and bloody sputum.

- ✓ They were likely to present with hypotension and to have multiple patches of consolidation, particularly in the upper lobes, with bulging fissures.



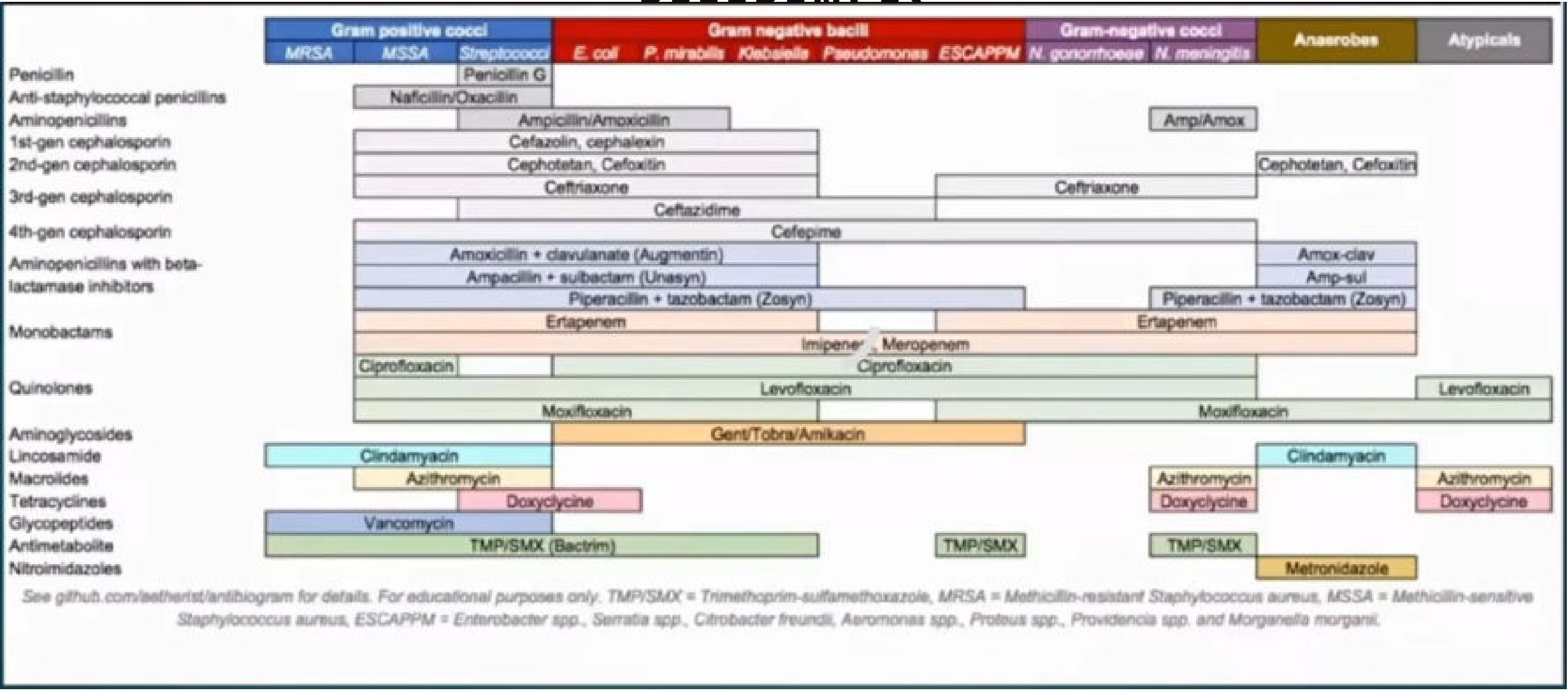
DIOGRAPH SHOWING A RE.

KLEBSIELLA PNEUMONIA.
CHEST RADIOGRAPH SHOWING A BULGING FISSURE

E. coli pneumonia and P. aeruginosa pneumonia usually occur in chronically ill patients; hemoptysis is rare, and pneumonia usually involves the lower lobes. Abscess and empyema occur frequently.

Acinetobacter pneumonia progresses very quickly, leading to severe hypoxemia, shock, bilateral consolidation, empyema, and even death within a few days

REFERENCES



See github.com/aetherist/antibiogram for details. For educational purposes only. TMP/SMX = Trimethoprim-sulfamethoxazole, MRSA = Methicillin-resistant Staphylococcus aureus, MSSA = Methicillin-sensitive Staphylococcus aureus, ESCAPPM = Enterobacter spp., Serratia spp., Citrobacter freundii, Aeromonas spp., Proteus spp., Providencia spp. and Morganella morganii.

Self reading , lung abscess and unresolving pneumonia

Thank you