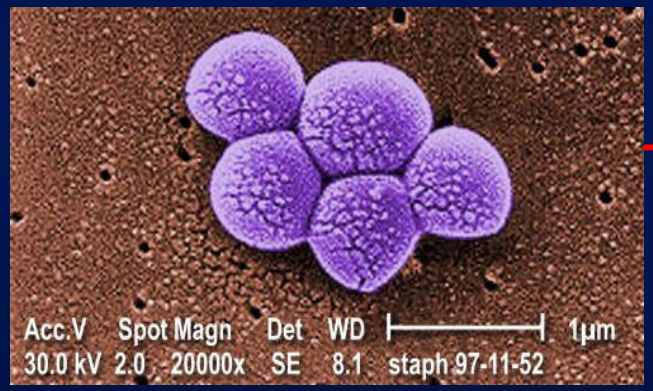
# Clinical Conditions Associated With Infections That Require Hospitalization




April 15, 2011

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Secretaria: Dra. Mónica Ana Rodríguez

# Case #1: History

- A previously healthy18-month-old male came to the clinic with 3 days of fever, rash, increasing upper and lower respiratory tract symptoms
- He was initially seen by his pediatrician 2 days before, was diagnosed empirically with influenza (fever $39^0$C) and given oseltamivir
- On the morning of the return visit, new problems:
  - Maculopapular rash
  - Increased respiratory distress, with the development of cyanosis

# Case #1 History

- Upon arrival at pediatrician's clinic, the child was noted to have serious respiratory symptoms: grunting, with nasal flaring and chest wall retracting, with cyanosis
- The Emergency Transport Team from Children's Hospital was called
- All immunizations have been provided

# Case #1: Examination

- GENERAL: Child was irritable, with increased work of breathing; $O_2$ sat: 60% to 70% in room air, increased to 85% with oxygen
- HEENT: Trachea is midline. No lymphadenopathy. Ears clear bilaterally. No conjuctivitis. Mild pharynx erythema.
- CARDIOVASCULAR: Tachycardia. No murmur
- PULMONARY: Coarse breath sounds, decreased on the left
- ABDOMEN: Soft, distended and nontender, no hepatosplenomegaly
- DERMATOLOGIC: Child has a fine, erythematous maculopapular rash over his trunk and back.

# Case #1: Laboratory

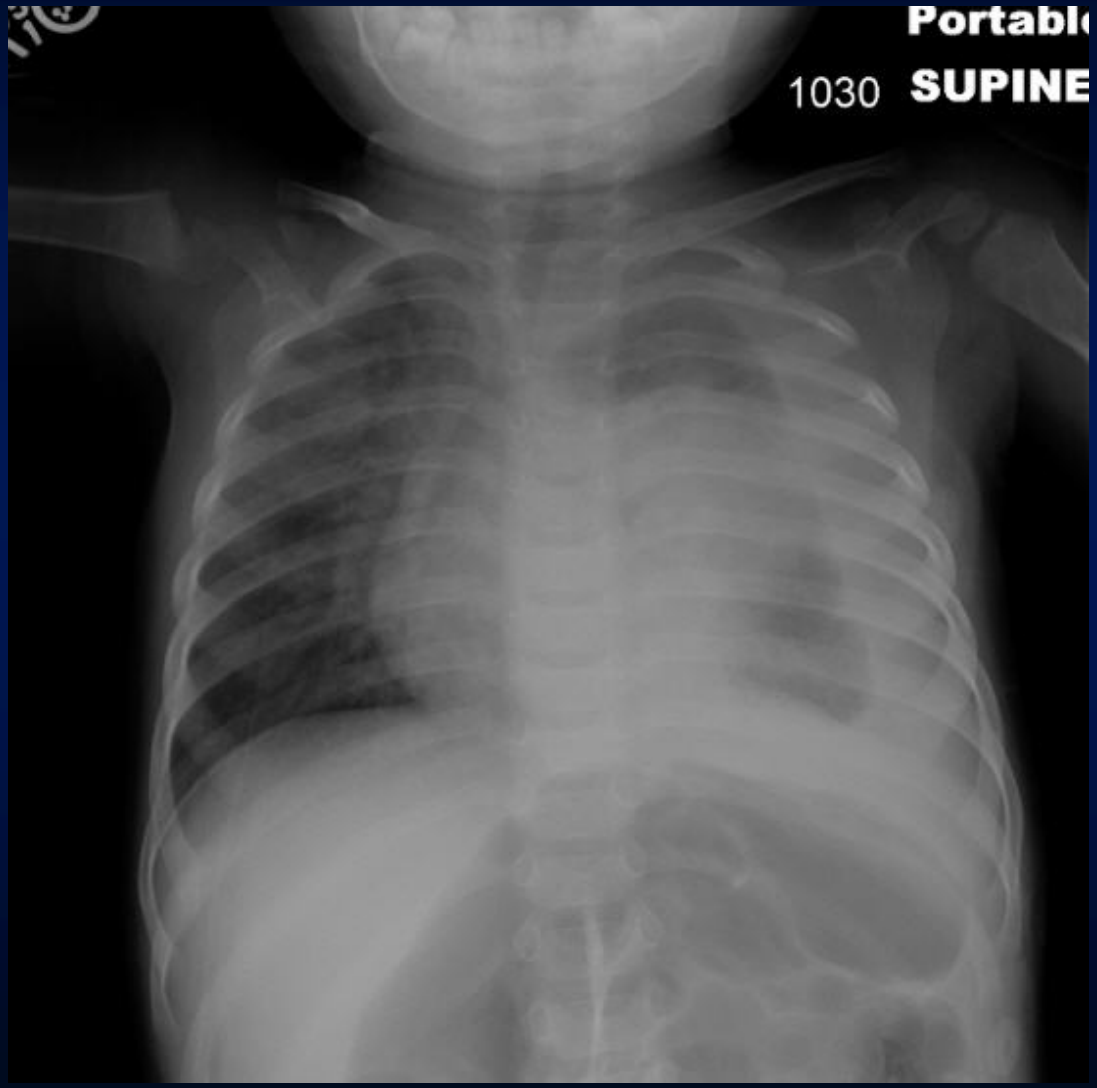
- White Blood Count: 2.3 x $10^3$/uL (segmented neutrophils 7%, band neutrophils 50%, lymphocytes 35%)
- Hemoglobin 10.4 Gm/dL, Hematocrit 31.4%
- Platelets 189 x $10^3$/uL
- CRP 53.3 (high) Normal: 0.0-0.99 mg/dL
- Electrolytes: Sodium 136, potassium 5.4, chloride 105, bicarbonate 16
- BUN 44; creatinine 1.2
- Urinalysis: normal
- Rapid Influenza EIA A/B Test: Negative (after 2 days of antiviral therapy
- ALT 30, GGT of 40.

# Case #1

- Antimicrobials started:

  vancomycin, cefepime and oseltamivir

- Pleural fluid examined at time of chest tube placement



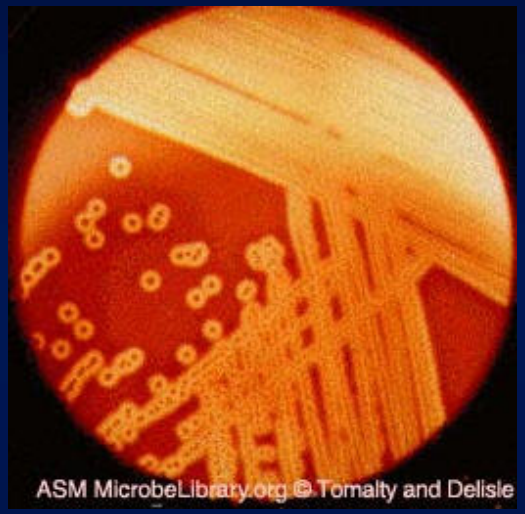
# Case #1 Question

**This child's sepsis/pneumonia is most likely to be caused by:**

1) ***Streptococcus pneumoniae***
2) ***Haemophilus influenzae,* type b**
3) ***Staphylococcus aureus* (MSSA or MRSA)**
4) ***Streptococcus pyogenes***
5) ***Pseudomonas aeruginosa***

# Case #1 Answer

- Pleural effusion cultures (and antigen test) yield:

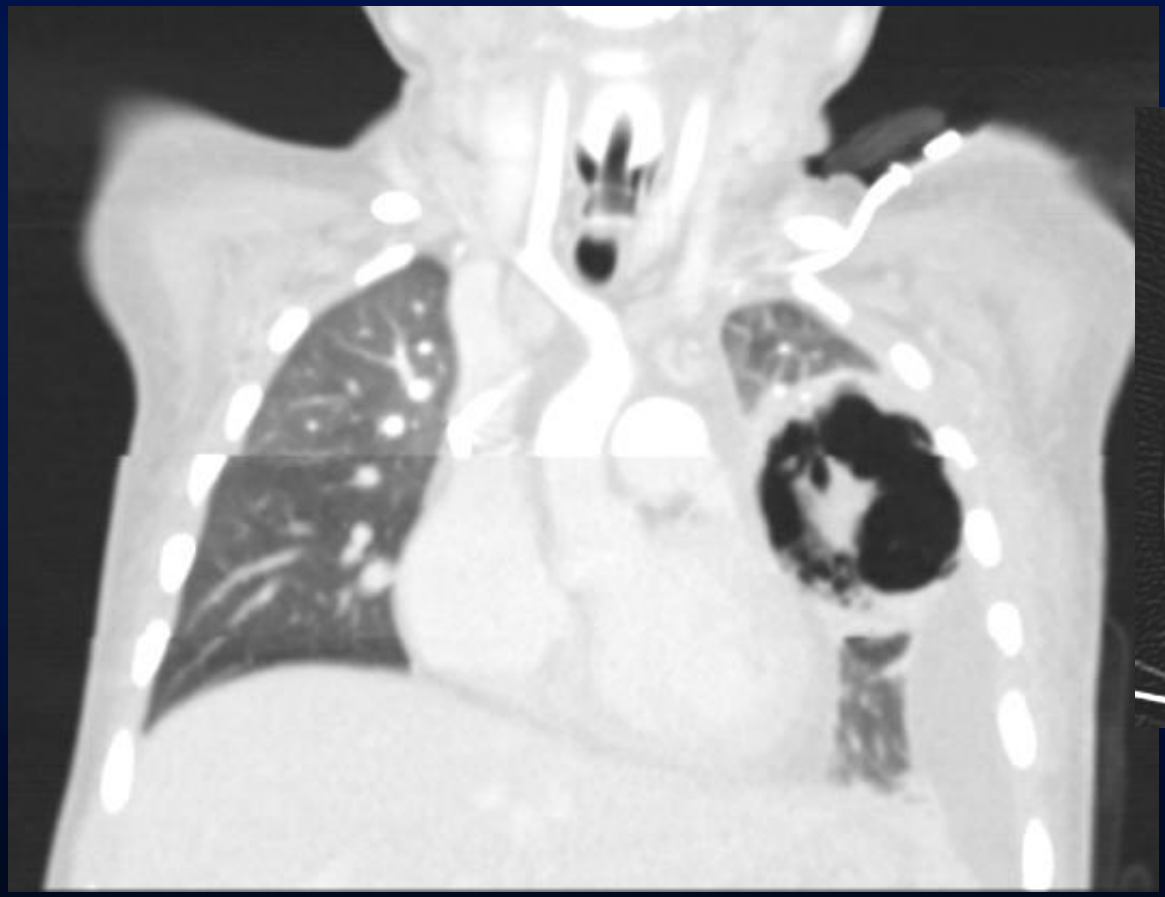


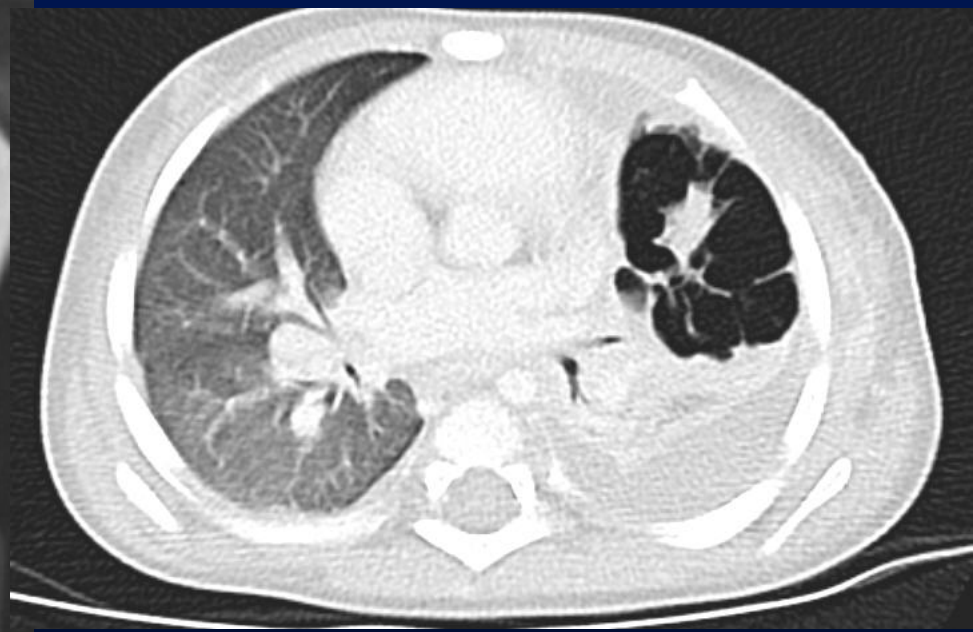

Group A streptococcus!

Vancomycin and cefepime changed to penicillin G!

# Case #1: Clinical Course

## Necrotizing Pneumonia





# Case #2: History

- A previously healthy 3 month old full term male comes to the Emergency Department (ED) in February (winter) with 3 days of fever, diarrhea and increased respiratory distress
- He was seen by his pediatrician 2 days prior to the ED visit for fever and irritability, and thought to have an upper respiratory tract viral infection
- He began to have diarrhea on the day of the ED visit, with 3 episodes of vomiting
- On the day of the ED visit, he had increased respiratory distress and persistent fever despite acetaminophen and ibuprofen

# Case #2: History

- Has received regular well-child care by his pediatrician, has received all of his 2 month immunizations (DTaP, HiB, PCV13, Rotavirus, Polio (IPV), Hepatitis B)
- Positive history of exposure to many other children with viral URI's at a Super Bowl party 5 days prior

# Case #2: Examination

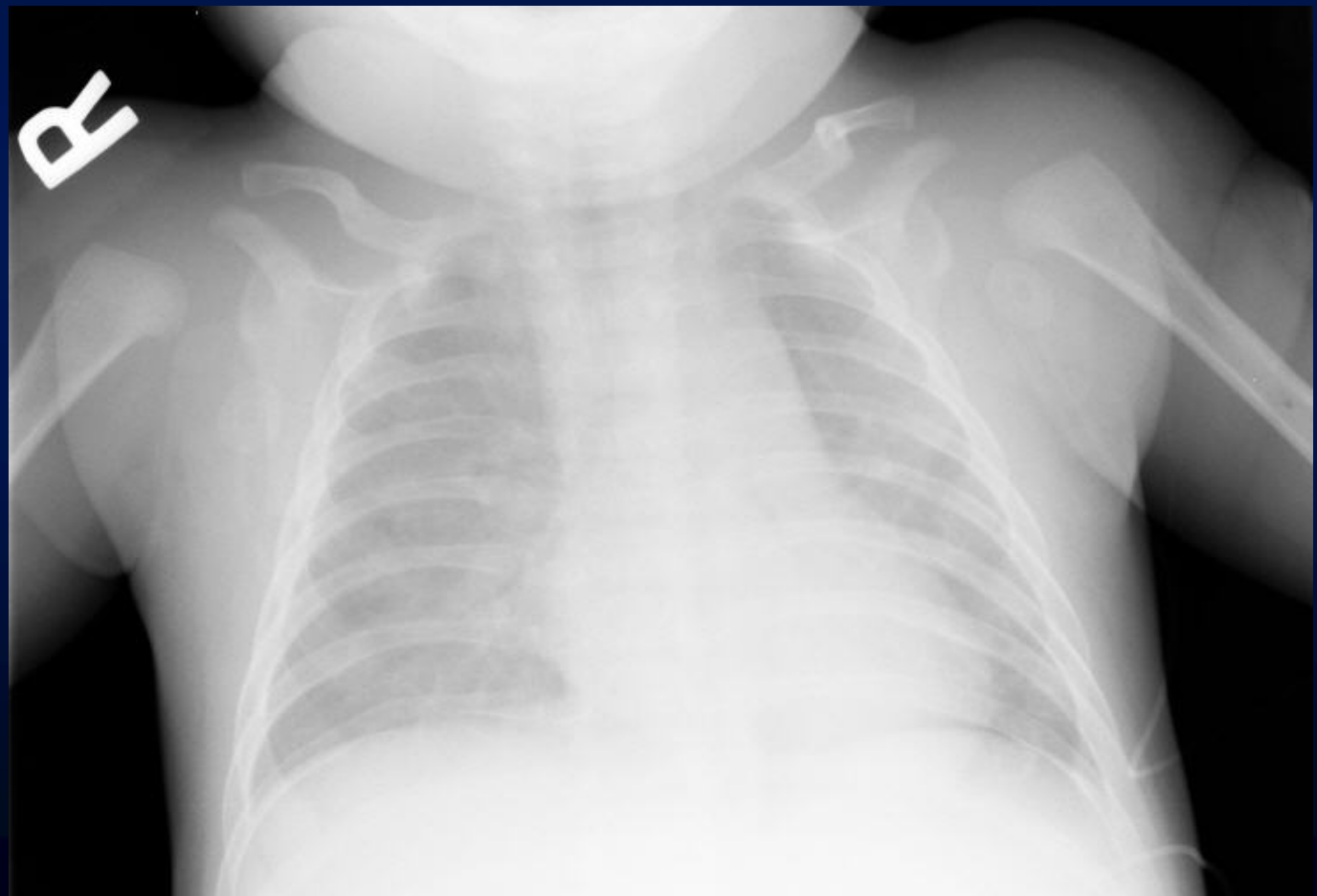
- Awake, alert, irritable but consolable; oxygen saturation 98% on nasal cannula $O_2$
- VITAL SIGNS: $41^0$C, HR 150/min, RR 45/min
- HEENT: Anterior fontanelle is soft. + Congestion
- CARDIAC: Tachycardic. No murmurs, warm and well perfused.
- PULMONARY: Coarse breath sounds. Mild increased work of breathing.
- ABDOMEN: Soft, nontender, nondistended with no hepatosplenomegaly
- EXTREMITIES: Warm and well perfused. Moving all extremities equally. No erythema or edema.
- SKIN: No rash

# Case #2: Laboratory

- White Blood Count: 3.2 x $10^3$/uL (segmented neutrophils 14% band neutrophils 9% myelocytes 2% metamyelocytes 1% lymphocytes 68%, atypical lymphocytes 2%)
- Hemoglobin 8.4 Gm/dL, Hematocrit 24.6%
- Platelets 65 x $10^3$/uL
- CRP 24.4 (high) Normal: 0.0-0.99 mg/dL
- Electrolytes: normal
- BUN 16; creatinine 0.5 (both normal)
- Urinalysis (by urine bag): nitrite negative; protein negative; leukocyte esterase positive; 2+ blood; 40 WBC/hpf
- Rapid Influenza A/B Test: Negative

# Case #2

- Blood, urine cultures taken (waiting on CSF)
- Ceftriaxone 50 mg/kg started



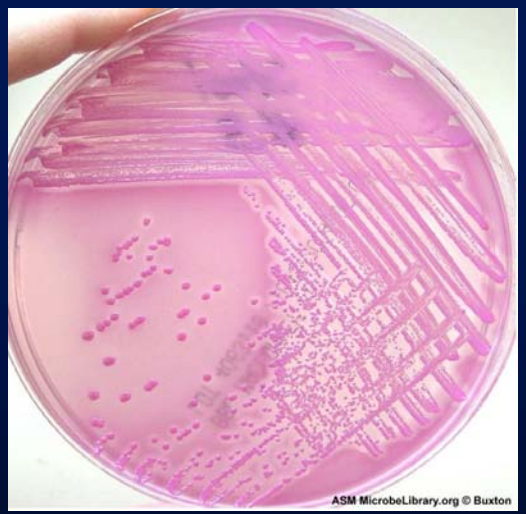
# Case #2 Question

**Which of the following infections is most likely in this 3 month old boy:**

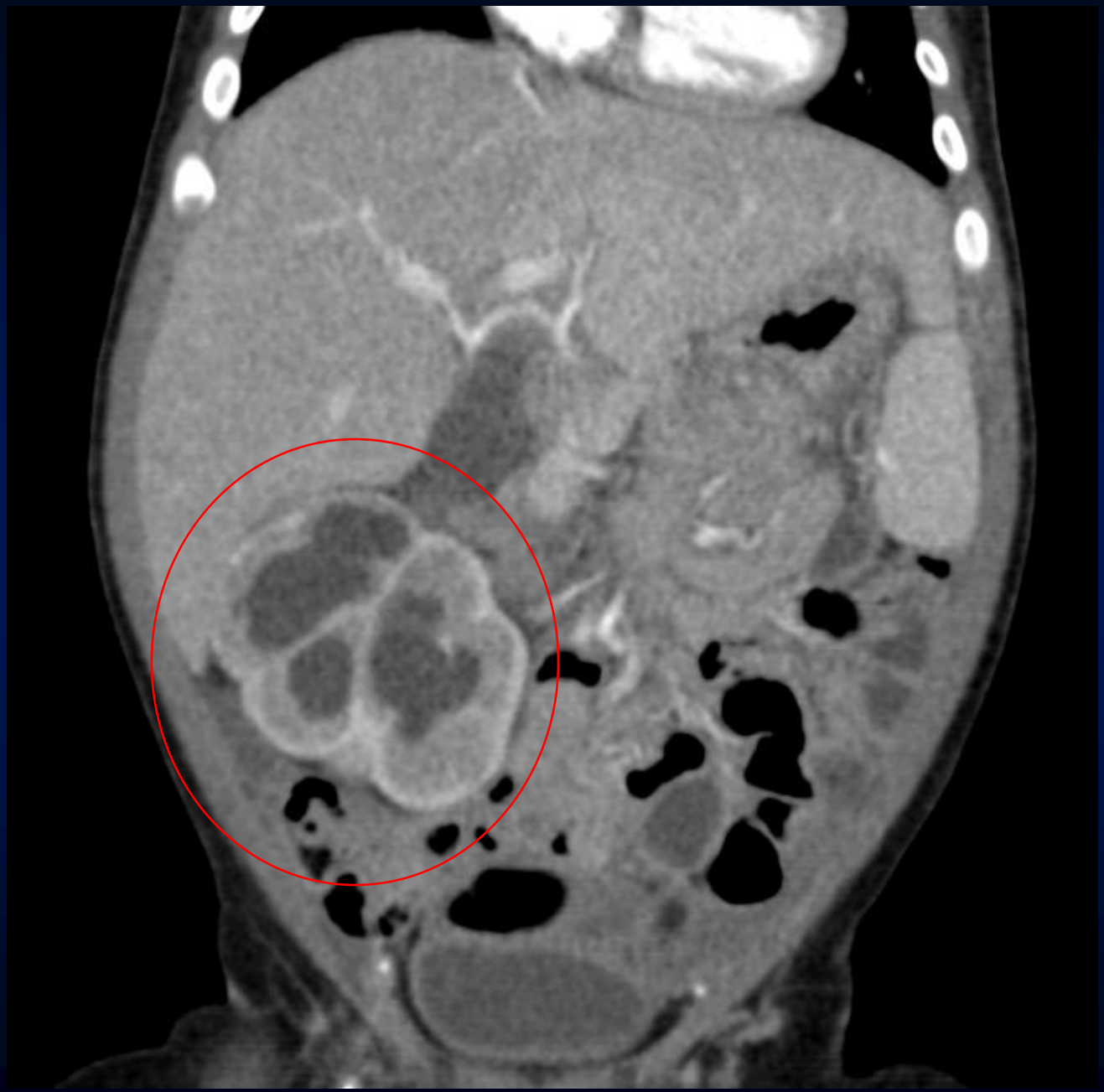
1) Viral sepsis (eg, adenovirus)
2) Pneumococcal sepsis
3) Meningococcal sepsis
4) Group A streptococcal sepsis
5) E. coli sepsis

# Case #2: Answer

- Blood Culture and Urine Culture are both positive for *E. coli*
  - Sensitive to Ampicillin, Cephalosporins, Aminoglycosides, and TMP/SMX

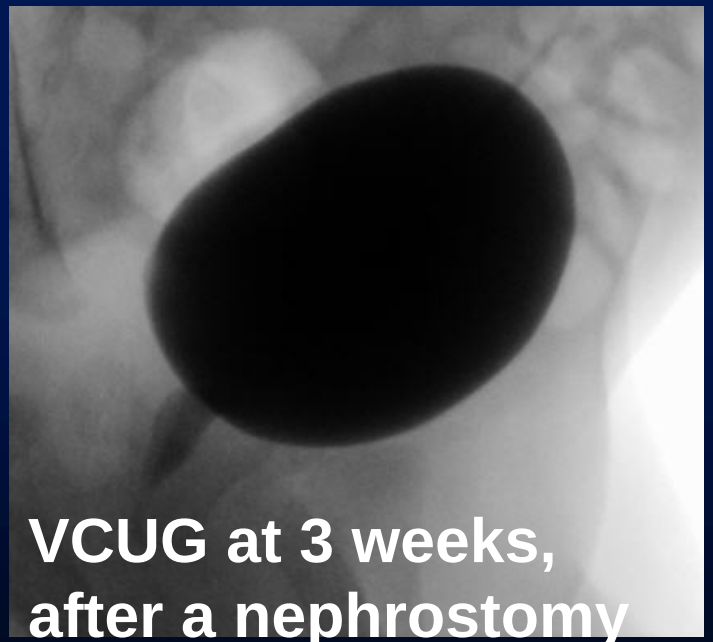



  - Antibiotics changed to ampicillin
- CT scan of the abdomen, with contrast:



# Case #2

## Hydronephrosis and Pyelonephritis of the Right Kidney with Urosepsis



VCUG at 3 weeks, after a nephrostomy is placed, is normal

# Case #3: History

- A 14 month old boy developed an upper respiratory tract infection 2 days before Christmas, at the time of a visit to “Santa Claus”

# Case #3: History

- He developed tachypnea, and some dyspnea 3 days later
- He was taken to his pediatrician who diagnosed a ‘chest cold’ caused by a virus, and sent him home without antibiotics, with reassurance to the parents
- No laboratory tests performed

# Case #3: History

- 2 days later (5 days into his illness), the parents called the pediatrician's office, as he was not improving
- The experienced "Advice Nurse" reassured the family that he did not need to come back to see the doctor if he was not getting worse
- He became **acutely dyspneic** at night 2 days later (New Year's Eve), and he was taken to the ED

# Case #3 History

- He had received regular well-child care by his pediatrician, and has received all of his immunizations appropriate for a 14 month old, including PCV7.

# Case #3 Examination

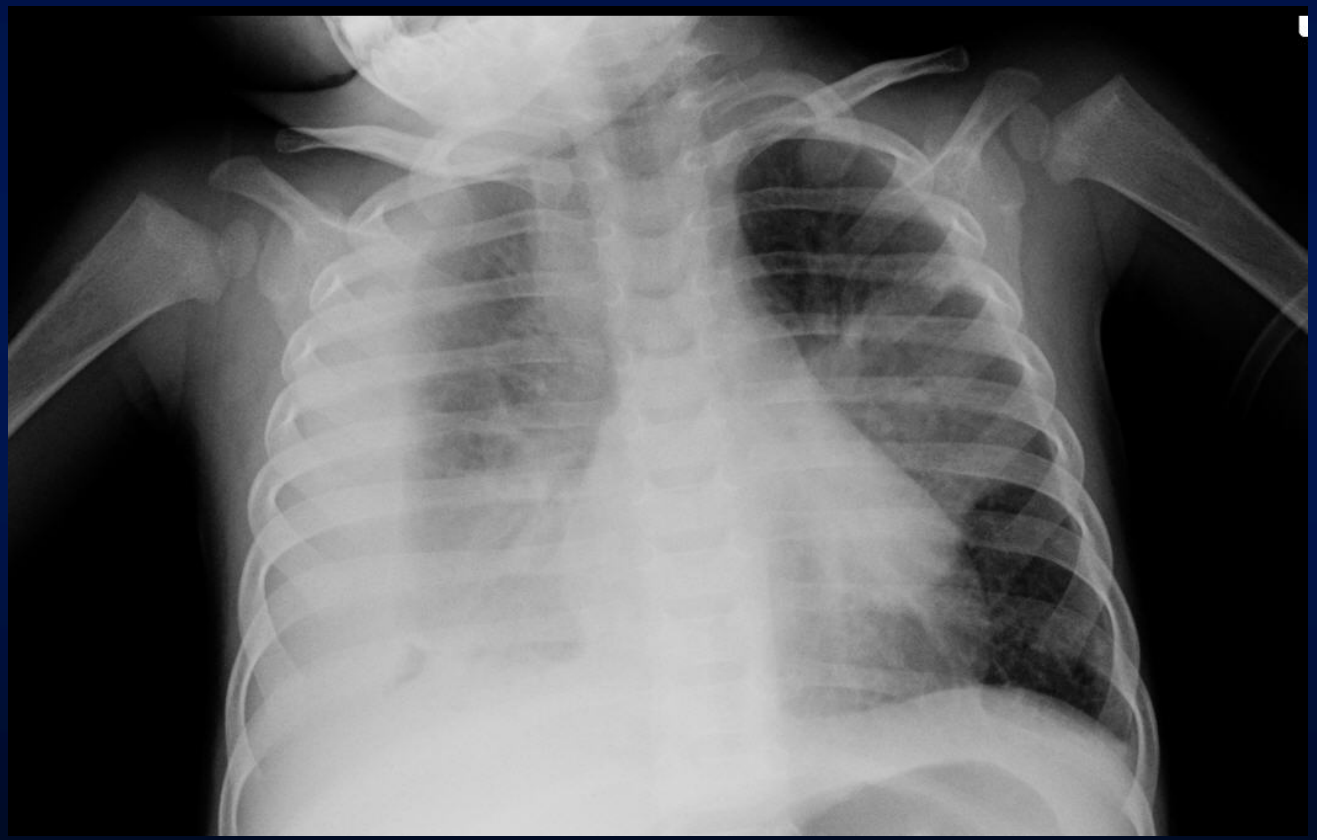
- The 14 mo infant is alert, anxious, in respiratory distress, grunting with $O_2$ sat: 83%
- VITAL SIGNS: 37.8$^0$C  HR 160/min, RR 68/min
- HEENT: no conjuctivitis; pharynx clear
- CARDIAC: Tachycardic. No murmur.
- PULMONARY: Bilateral coarse breath sounds, subcostal retractions
- ABDOMEN: Soft, nontender, markedly distended with no hepatosplenomegaly
- EXTREMITIES: Cool, but no cyanosis, no edema.
- SKIN: No rash. No erythema.

# Case #3 Laboratory

- White Blood Count: 4.8 x $10^3$/uL (segmented neutrophils 2%; band neutrophils 27%; myelocytes 3%; metamyelocytes 4%; lymphocytes 27%)
- Hemoglobin 11.0 Gm/dL, Hematocrit 33.3%
- Platelets 256 x $10^3$/uL
- CRP 29.5 (high) Normal: 0.0-0.99 mg/dL
- Electrolytes: normal
- BUN 21; creatinine 0.3 (both normal)
- Urinalysis (by catheter): nitrite negative; protein 2+; leukocyte esterase negative; 1+ blood; 6 WBC/hpf
- Rapid Influenza A/B Test: Negative
- Blood and urine cultures obtained

# Case #3 CXR

- CXR at hospitalization
- Vancomycin and ceftriaxone started



# Case #3 Question

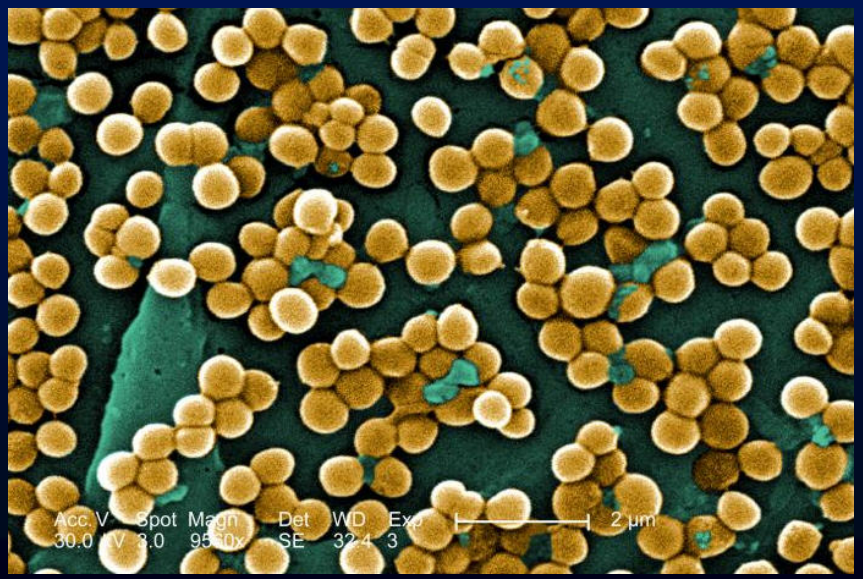
**Which of the following infections is most likely in this 14 month old boy:**

1) **Viral Sepsis/pneumonia (eg, influenza)**
2) **Pneumococcal bacteremia /pneumonia**
3) **Hantavirus sepsis/pneumonia**
4) **Group A streptococcal bacteremia/pneumonia**
5) **Staphylococcal bacteremia/pneumonia**

# Case #3

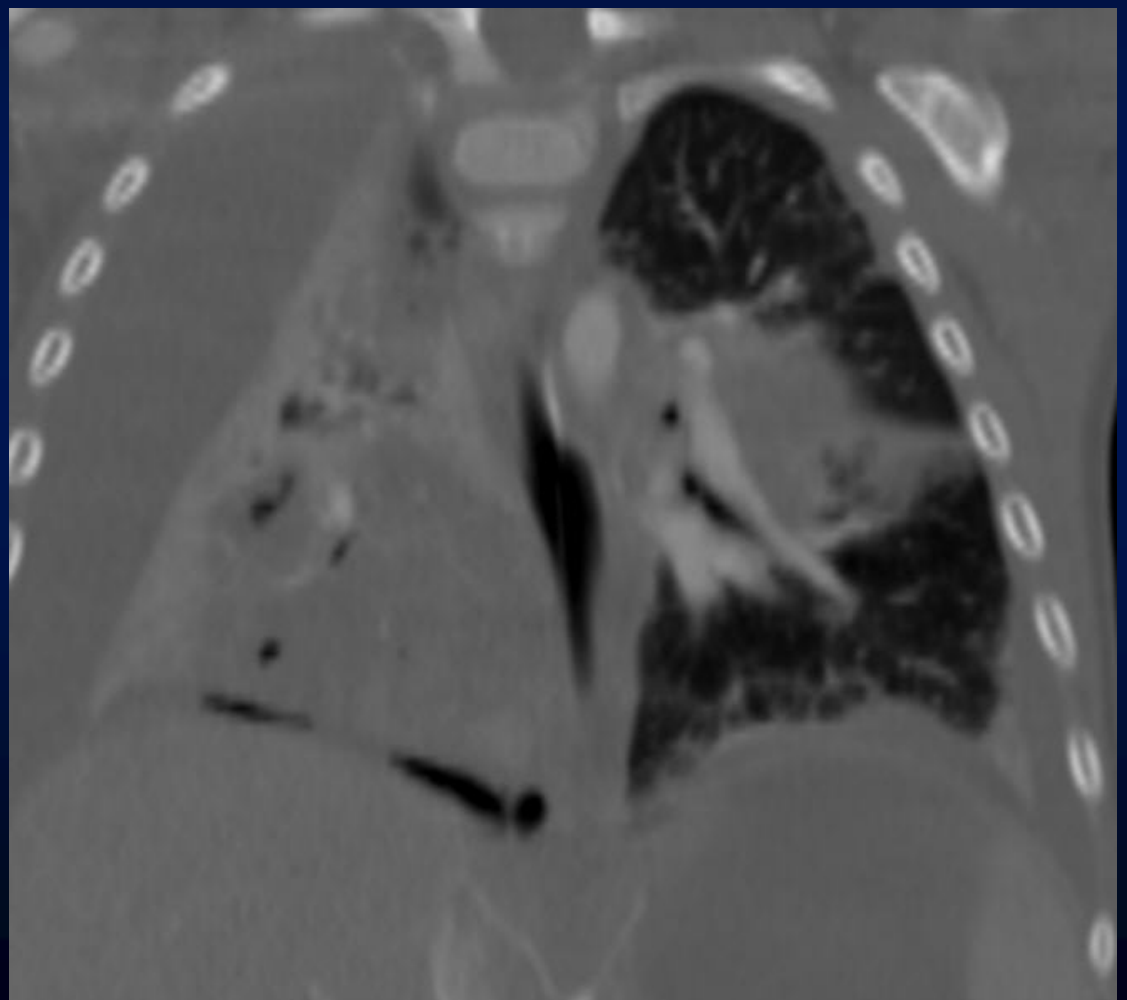
- Blood Culture and Pleural fluid culture both positive for MRSA
- Urine Culture negative

- Vancomycin continued (with clindamycin)



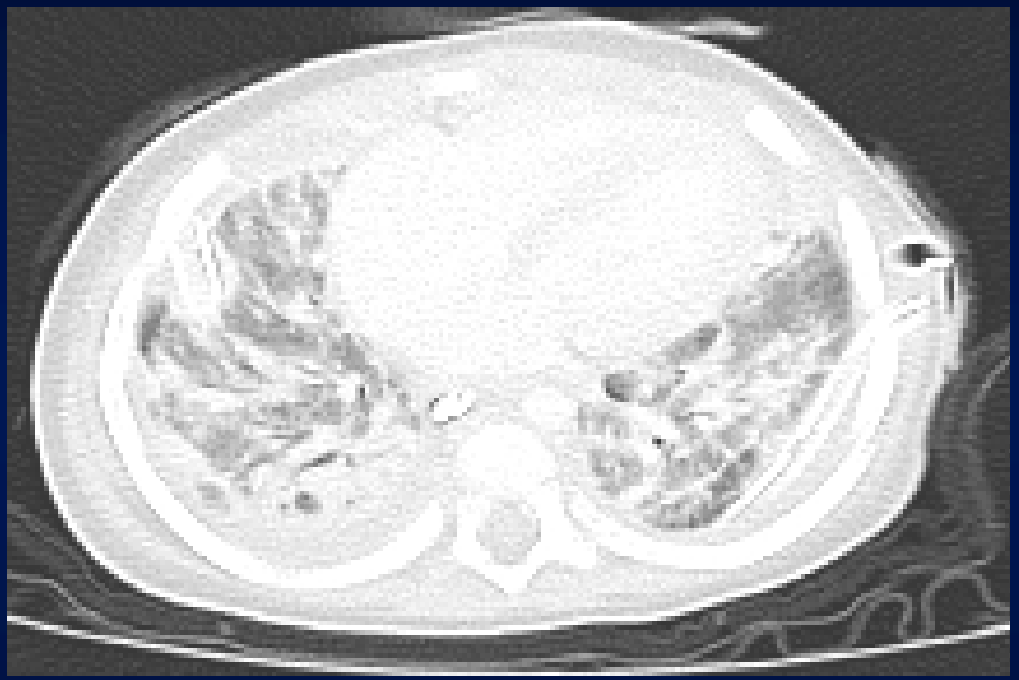
# Case #3: Clinical Course

- Within 4 hours, he was intubated and ventilated



# Case #3 Follow-up

- CT 1 month later



- CXR 2 years later