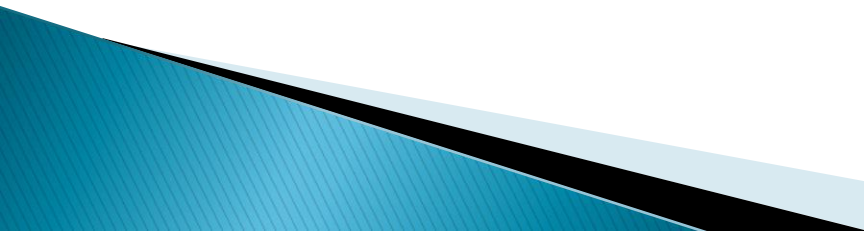



Sinusitis

Chelsea Gatcliffe


PGY 1

- ▶ Jessie is a 3 year old girl who presents to the ED late Monday night, with a 4 day history of rhinorrhea, fever and decreased appetite. Mother reports she started with a runny nose on Friday after coming home from daycare.
 - ▶ Overnight, her symptoms worsened and she had difficulty sleeping. On Saturday morning she was febrile to 39 C but mom treated with Tylenol and fever decreased.
 - ▶ Jessie had continued production of purulent sputum over the weekend but did not see a doctor.
- 

- ▶ Mother kept her home from school on Monday but patient still spiking fevers ‘on and off’. Jessie was still irritable and now complaining of headache and refused PO all day with one episode of vomiting after feeds.
 - ▶ Brought her to ED at 11 pm for evaluation.
 - ▶ Physical exam: Patient is febrile to 38, but vitals otherwise stable. Fussy on examination but no focus of infection found besides purulent nasal discharge and ‘mouth breathing.’
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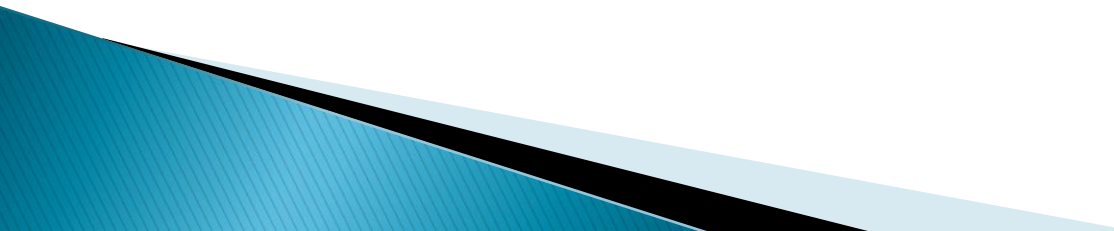
Acute Bacterial VS. Viral Rhinosinusitis

ABRS Defined as:

- 1.) Onset with persistent symptoms or signs compatible with acute rhinosinusitis, lasting for 10 days without any evidence of clinical improvement
 - 2.) Onset with severe symptoms or signs of high fever (39C or 102 F) and purulent nasal discharge or facial pain lasting for at least 3-4 consecutive days at the beginning of illness
- 

OR

3.) Onset with worsening symptoms or signs characterized by the new onset of fever, headache, or increase in nasal discharge following a typical viral upper respiratory infection (URI) that lasted 5–6 days and were initially improving (“doublesickening”)



How should Jessie be treated?

- A.) Amoxicillin– 40 mg/kg/day
- B.) Amoxicillin/ Clavulanic Acid– 40 mg/kg/day
- C.) Amoxicillin/ Clavulanic Acid– 90 mg/kg/day
- D.) Cefpodoxime/ Clindamycin– 10 mg/kg/day
- E.) Levofloxacin – 10 mg/kg/day

Correct Answer

- ▶ **C– High Dose Amoxicillin with Clavulanic Acid** recommended for children and adults with ABRS:
 - From geographic regions with high endemic rates (10%) of invasive penicillin–nonsusceptible (PNS) *S. pneumoniae*,
 - those with severe infection (eg, evidence of systemic toxicity with fever of 39C [102F] or higher, and threat of suppurative complications)
 - attendance at daycare, age < 2, recent hospitalization, antibiotic use within the past month, or who are immunocompromised.

Incorrect Answers

- ▶ **A– Amoxicillin**– The addition of clavulanate to amoxicillin will improve the coverage of both B–lactamase producing *H. influenzae* and *M. catarrhalis*.
- ▶ **B– High Dose Recommended** as above
- ▶ **D– Cephalosporin**– Used as first line in patients with Type 1 hypersensitivity to penicillin. Clinda added for coverage against resistant Strep Pneumo and HiB.
- ▶ **E– Levofloxacin**– no benefit over Augmentin in RCT. Added cost and increased adverse side effects.

Table 6. Prevalence (Mean Percentage of Positive Specimens) of Various Respiratory Pathogens From Sinus Aspirates in Patients With Acute Bacterial Rhinosinusitis

Microbial Agent	Publications Before 2000		Publications in 2010	
	Adults ^a (%)	Children ^b (%)	Adults ^c (%)	Children ^d (%)
<i>Streptococcus pneumoniae</i>	30–43	44	38	21–33
<i>Haemophilus influenzae</i>	31–35	30	36	31–32
<i>Moraxella catarrhalis</i>	2–10	30	16	8–11
<i>Streptococcus pyogenes</i>	2–7	2	4	...
<i>Staphylococcus aureus</i>	2–3	...	13	1
Gram-negative bacilli (includes <i>Enterobacteriaceae</i> spp)	0–24	2
Anaerobes (<i>Bacteroides</i> , <i>Fusobacterium</i> , <i>Peptostreptococcus</i>) ^e	0–12	2
Respiratory viruses	3–15
No growth	40–50	30	36	29

^a Data compiled from [87–89].

^b Data compiled from [81, 90].

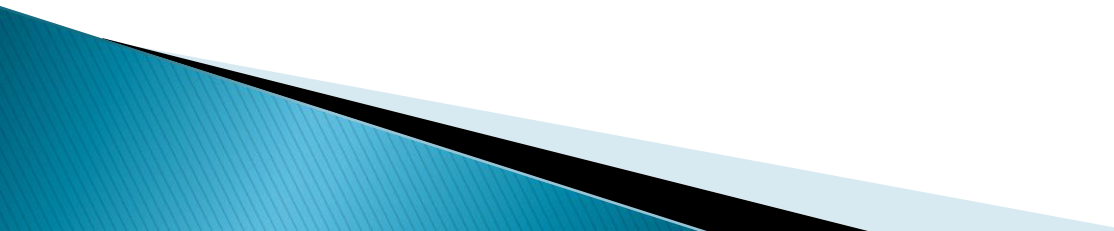
^c Data from [45].

^d Data extrapolated from middle ear fluid of children with acute otitis media [86, 91].

^e Primarily in odontogenic infections [92].

Duration of Treatment

Treatment still recommended for 10–14 days. An alternative management strategy is recommended if symptoms worsen after 48–72 hours of initial empiric antimicrobial therapy or failure to improve despite 3–5 days of initial empiric antimicrobial therapy.



Reference

https://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/IDSA%20Clinical%20Practice%20Guideline%20for%20Acute%20Bacterial%20Rhinosinusitis%20in%20Children%20and%20Adults.pdf

IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and Adults.
Chow et al. March 20, 2012

- ▶ Patient is started on High Dose Augmentin per IDSA Guidelines and sent home. She then represents one week later with persistent fever and swelling in L eye. PE reveals pain with EO movement and proptosis.



▶ What is the best imaging option to identify sinus inflammation and to rule out complications?

A.) Plain Film X Ray of Sinuses

B.) Sinus Ultrasound

C.) MRI

D.) CT

CT VS. MRI

- ▶ D.) CT– Considered gold standard for assessing bony and anatomical changes associated with acute or chronic sinusitis, whereas MRI is useful to further delineate the extent of soft tissue and inflammation.
- ▶ CT also preferred due to shorter study and lack of need for sedation for patients under 5.
- ▶ MRI may be preferable for older patients or if intracranial complications are more likely.
- ▶ Plain Film XR not adequately sensitive– viral vs bacterial?– Will usually be abnormal.
- ▶ Paranasal sinus U/S not effective in evaluating orbital/ intracranial involvement.

Remember!

By 12 years of age, the development of the nasal cavity and the paranasal sinuses is nearly completed and they have reached adult proportions. One way to remember the sequence of how sinuses develop is the following mnemonic:

"Maxillaries Early, Sphenoids Follow" =
1. Maxillary, 2. Ethmoids, 3. Sphenoids,
4. Frontals

References

- ▶ Picture– Google Images – “Orbital Cellulitis Children”, <http://simple-health-secrets.com/pathophysiology-of-orbital-cellulitis-images-pathophysiology-of-orbital-cellulitis-pictures/>
- ▶ IDSA Guidelines– As Above
- ▶ <http://pediatrics.aappublications.org/content/132/1/e262.full.pdf> Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years. Wald et al. Pediatrics. June 24 2013