

การอบรมระยะสั้นสมาคมโรคติดเชื้อแห่งประเทศไทยประจำปี 2559

Pearls & Pitfalls in Infectious Diseases

Difficult to **NOT** Treat Infections in ENT

Acute Bacterial Rhinosinusitis

นพ.สุสัณห์ อาศนะเสน

สาขาวิชาโรคติดเชื้อและอายุรศาสตร์เขตร้อน

ภาควิชาอายุรศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล

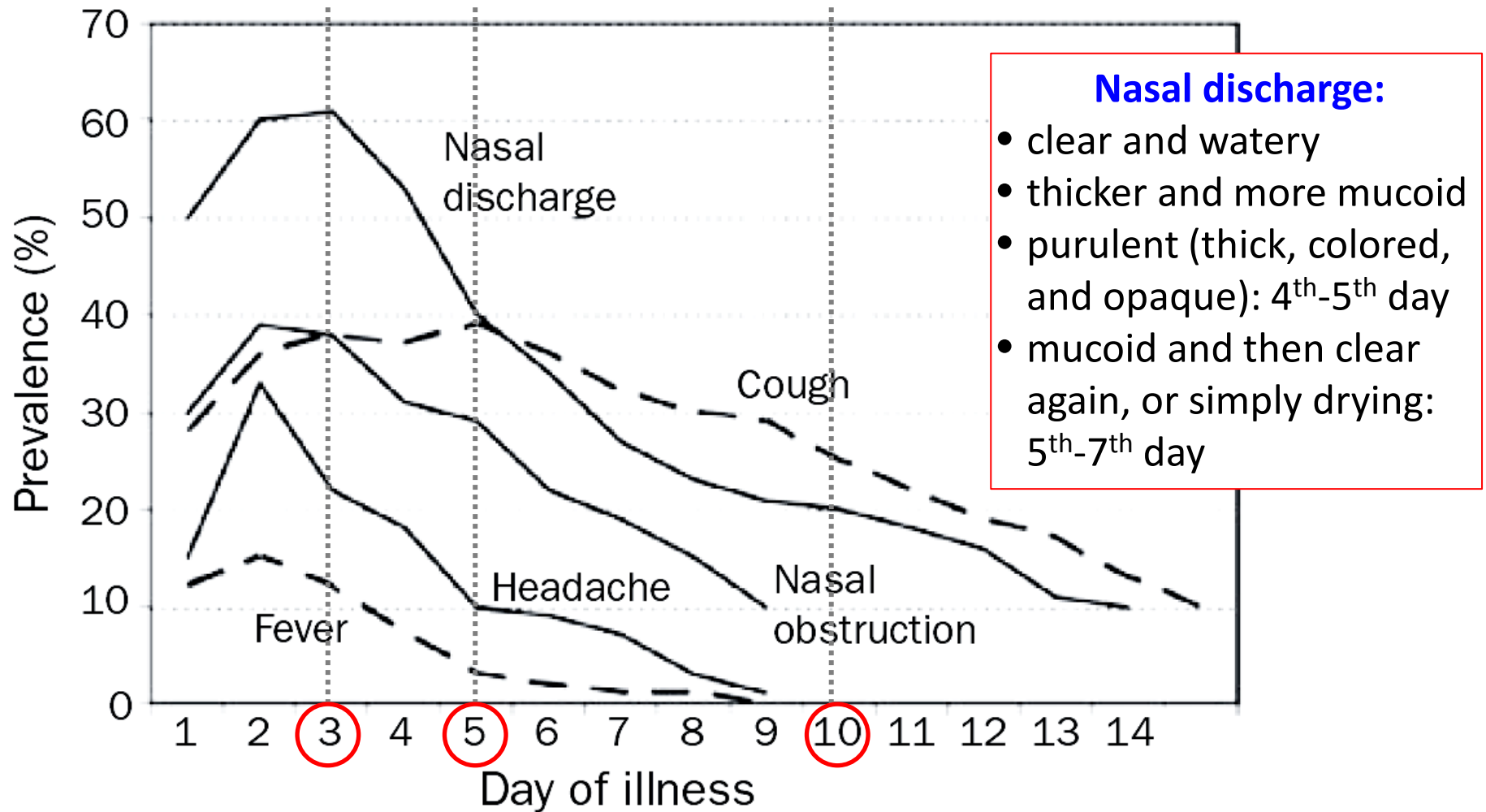
ห้องประชุม SALON 8 โรงแรมสวิสโฮเทล เลอ คองคอร์ด

วันที่ 18 มีนาคม 2559 เวลา 9:15 – 10:00 น.

Topics

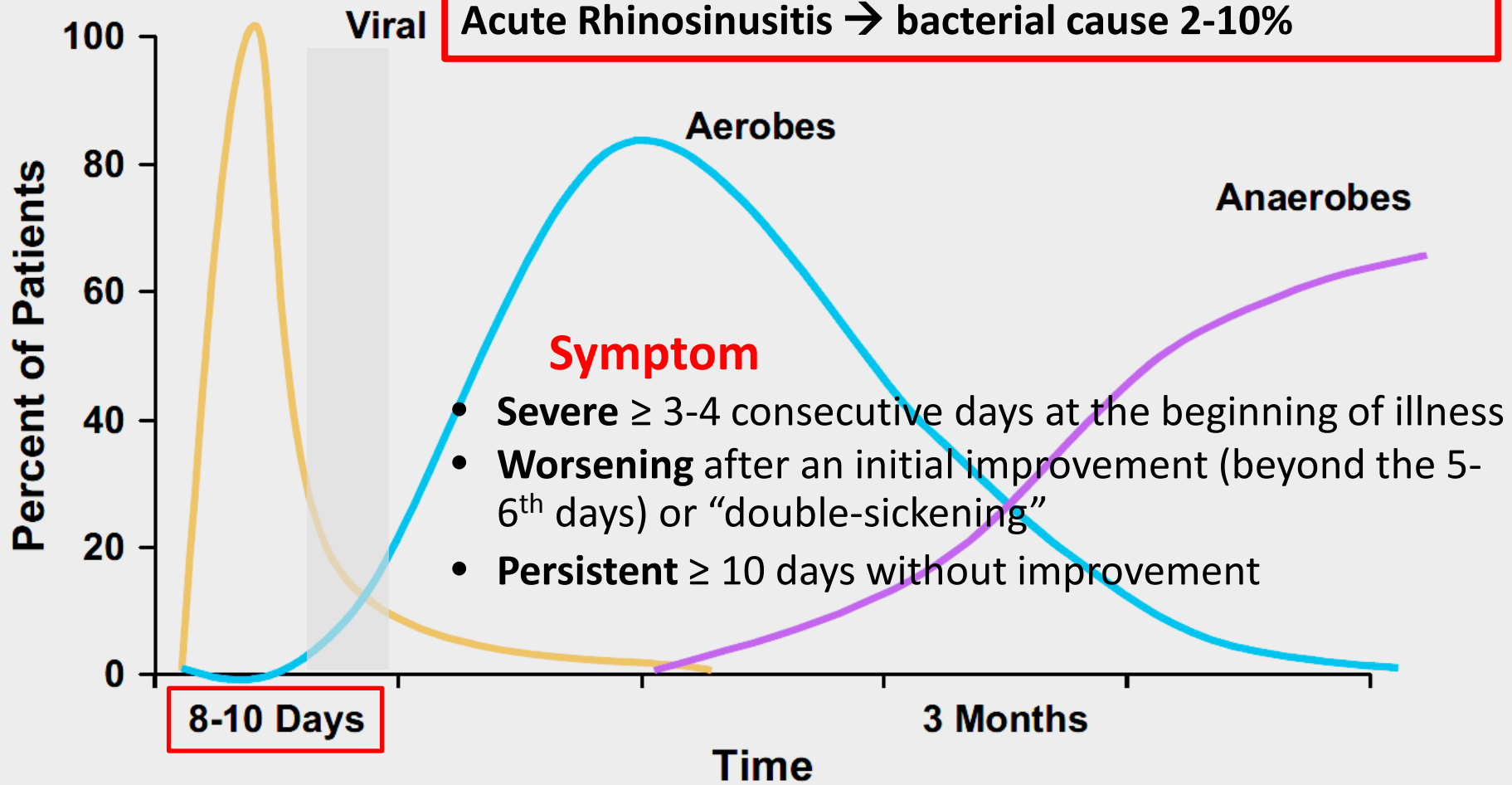
1. Are we really need an antibiotic for the management of acute uncomplicated rhinosinusitis in adults?
2. Can we believe the results of endoscopically directed cultures of the middle meatus in patients with rhinosinusitis?
3. What are the three most common causative bacteria for acute rhinisinusitis in Thai population?
4. Current in vitro susceptibility data of common causative organisms for acute bacterial rhinosinusitis

Symptom Prevalence by Day for Rhinovirus Illness



The Chronology of Viral and Bacterial Causes of Sinusitis

Viral URI → ABRS 0.5 -2.0 %(adults), 5% (children)
Acute Rhinosinusitis → bacterial cause 2-10%



ABRS: 3 – 5 – 10

Neuraminidase inhibitors for preventing and treating influenza in adults and children (Review)

Time to first symptom alleviation

Oseltamivir

- 7.0 vs. 6.3 days
- 16.8 hours (95% CI 8.4 to 25.1, $P < 0.0001$)

Zanamivir

- 6.6 vs. 6.0 days
- 0.6 days (95% CI 0.39 to 0.81, $P < 0.00001$)

Hospitalisations

no significant effect: risk difference 0.15% (95%CI -0.78 to 0.91)

Bronchitis, sinusitis and otitis media

Zanamivir significantly reduced the risk of bronchitis in adult treatment trials (RD 1.80%, 95% CI 0.65 to 2.80); NNTB = 56 (36 to 155), but not oseltamivir. **Neither NI significantly reduced the risk of otitis media and sinusitis in both adults and children**



Cochrane
Library

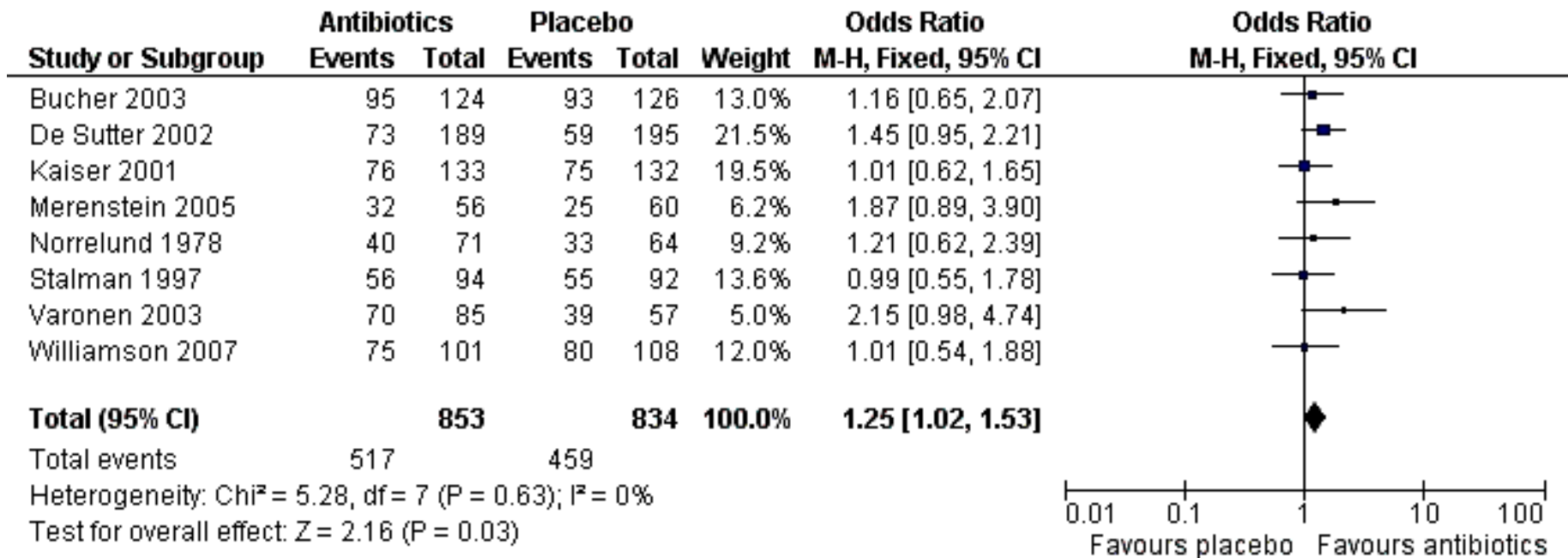
Cochrane Database of Systematic Reviews

Antibiotics for clinically diagnosed acute rhinosinusitis in adults (Review)

Lemienre MB, van Driel ML, Merenstein D, Young J, De Sutter AIM

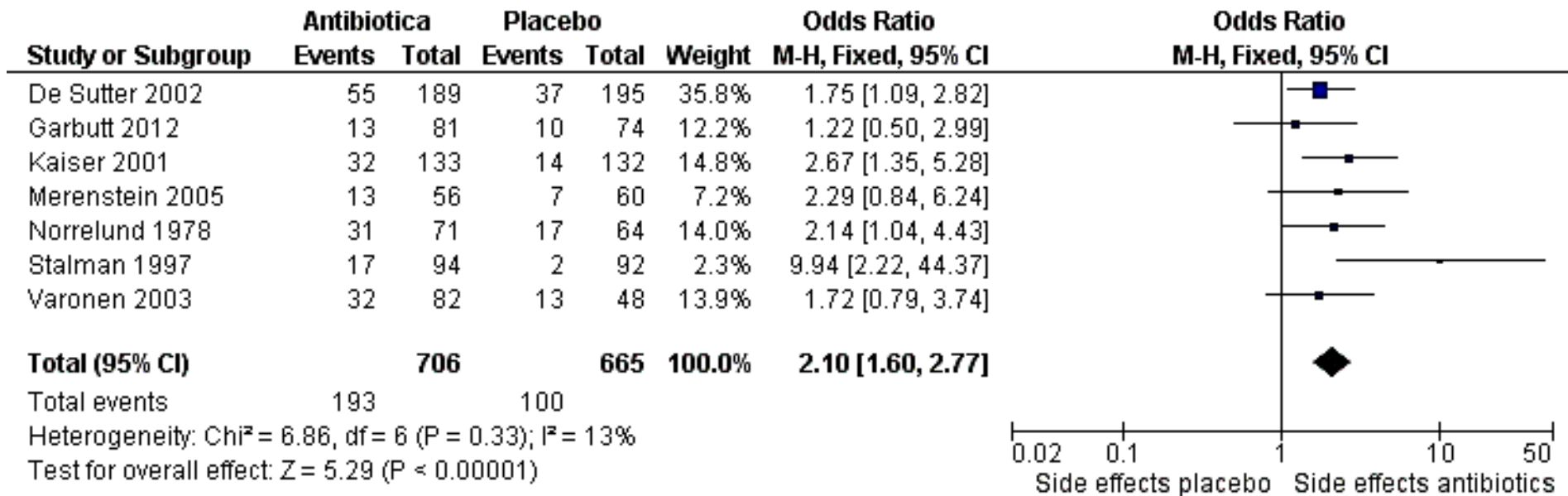
- 10 trials 2,450 participants
- The diagnosis of acute rhinosinusitis: **clinical symptoms only**, i.e. purulent discharge from the nose or other rhinosinusitis-like symptoms, such as unilateral facial pain or pressure, pain when bending forward, pain in the upper teeth or when chewing, and postnasal drip [*uncomplicated viral URI + ABRs*]

Overall Treatment Effect



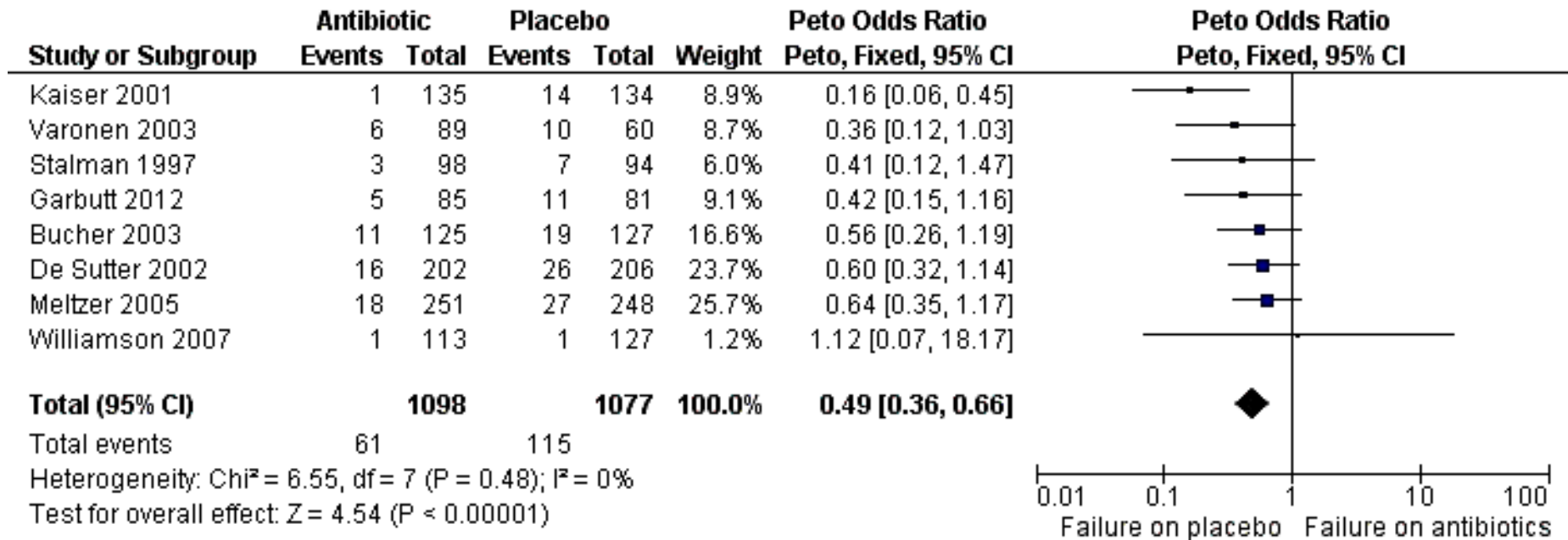
- Overall cure rate: 47% at D7, 49.5% at D10, and 71% at D14
- The estimated OR for the overall treatment effect of antibiotics relative to placebo was 1.25 (95%CI 1.02 to 1.53), NNTB = 18.0 (95%CI 9.7 to 114.9)
- Subgroup analysis, there were no significant differences between the groups:
 - after 7 days: OR 1.07 (95% CI 0.81 to 1.41)
 - after 10 days: OR 1.18 (95% CI 0.92 to 1.52)
 - after 14 days: OR 1.48 (95% CI 0.99 to 2.23)
- Irrespective of the timing of the endpoint, the estimated OR for the resolution of purulent secretion was 1.58 (95% CI 1.13 to 2.22), NNTB 10.8 (95% CI 6.1 to 50.8)

Side Effects



1. The common adverse effects: nausea, vomiting, abdominal pain, stomach pain, diarrhea, skin rash, dizziness, and fatigue.
2. Of the participants who experienced adverse effects, 27.3% received antibiotics and 15% received the placebo (OR 2.10, 95% CI 1.60 to 2.77), NNTH = 8.1 (95% CI 6.0 to 12.5)
3. Of those participants who received antibiotics, 15.9% reported suffering from diarrhea and 10.4% of participants who received placebo suffered from diarrhea (OR 1.81, 95% CI 1.18 to 2.78), NNTH 18.1 (95% CI 9.9 to 108.7).

Treatment Failure



- More participants in the placebo group had to start antibiotic therapy in comparison to the antibiotic group because of an abnormal course of rhinosinusitis (exacerbation, ongoing symptoms, respiratory complications, treatment failure) 10.7% vs. 5.5%, OR 0.49 (95% CI 0.36 to 0.66), (NNTH 19.5, 95% CI 13.5 to 35.3) .

Antibiotics for clinically diagnosed acute rhinosinusitis in adults (Review)

Antibiotics compared to placebo for clinically diagnosed acute rhinosinusitis in adults

Patient or population: clinically diagnosed acute rhinosinusitis in adults
Settings: general practice (8 studies), otolaryngology outpatient clinics of a university hospital (2 studies), medical centres (1 study)
Intervention: antibiotics
Comparison: placebo

Acute Rhinosinusitis:
bacterial cause 2-10%

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No. of participants (studies)	Quality of the evidence (GRADE)	Comments	
	Assumed risk	Corresponding risk				Diff./100 Pts.	NNT
	Placebo	Antibiotics					
Cure	55 per 100	60 per 100 (56 to 65)	OR 1.25 (1.02 to 1.53)	1687 (8 studies)	⊕⊕⊕⊕ high	+ 5	18.0
Resolution of purulent secretion	60 per 100	70 per 100 (63 to 77)	OR 1.58 (1.13 to 2.22)	660 (3 studies)	⊕⊕⊕⊕ high	+ 10	10.8
Side effects	15 per 100	27 per 100 (22 to 33)	OR 2.10 (1.60 to 2.77)	1371 (7 studies)	⊕⊕⊕⊕ high	+ 12	8.1
Diarrhoea	10 per 100	17 per 100 (12 to 24)	OR 1.81 (1.18 to 2.78)	816 (4 studies)	⊕⊕⊕⊕ high	+ 7	18
Treatment failure	11 per 100	6 per 100 (4 to 7)	OR 0.49 (0.36 to 0.66)	2175 (8 studies)	⊕⊕⊕⊕ high	- 5	19.5

1. Antibiotics cannot fasten pain relief or the general feeling of illness.
2. Patients who take antibiotics do not resume their daily activities earlier and do not take less analgesics or nasal decongestants than patients treated with placebo.

Conclusions: ATB & Acute Rhinosinusitis

1. There is no place for routine antibiotics in the adult patient with clinically diagnosed, uncomplicated acute rhinosinusitis :

“symptomatic relief and watchful waiting”: 7-day waiting period after diagnosis without antibiotics to see if you get better on your own

2. Exceptions:

- Patients with severe disease (e.g. high fever, findings suggestive of severe sepsis such as hypotension, intracranial expansion, periorbital swelling, severe facial pain pressure etc.)
- Patients with a suppressed immune system
- Patients with symptom worsening or persisting > 5-7 days AFTER symptomatic relief e.g. analgesics, intranasal corticosteroids, saline irrigation, decongestants
- Children
- Patients referred to an ENT specialist because of confirmed or perceived complications
- Patients who are unlikely to return for follow-up

3. Evidence that serious complications can be prevented by giving antibiotics early is still lacking:

complications are so rare (1/2450 participants)



Comments by Prof. Ronald B. Kuppersmith, Editorial Boards of *Otolaryngology–Head and Neck Surgery*

1. Because practicing physicians cannot prescribe a placebo, a “placebo effect” cannot be obtained, and watchful waiting may not be an equivalent substitute for placebo in a clinical trial
2. Most clinicians understand the rationale for watchful waiting, including the cost, potential side effects for the individual patient, and the risk of increased bacterial resistance in the community.
3. Unfortunately, in clinical practice, implementation can be difficult. In a survey of parents offered “watchful waiting” as management for their child’s acute otitis media, 40% said they would be “somewhat or extremely dissatisfied.” Of surveyed physicians, 38% “never or almost never” recommended initial observation
4. In addition to treating symptoms and educating patients about the risks of antibiotic usage, informing patients that an antibiotic prescription will be provided, either written at the visit for use at a later time or by encouraging the patient to call back to the clinic after the required time has passed, frequently makes watchful waiting more palatable, provides the necessary reassurance, and results in a satisfied patient.

Signs & Symptoms either:

- a) Persistent & not improving (≥ 10 days);
- b) Severe ($\geq 3-4$ days); or
- c) Worsening or "double-sickening" ($\geq 3-4$ days)

Risk for antibiotic resistance

- Age < 2 or > 65 , daycare
- Prior antibiotics within the past month
- Prior hospitalization past 5 days
- Comorbidities
- Immunocompromised

Risk for Resistance

No

Yes

Symptomatic management

Initiate first-line antimicrobial therapy

Initiate second-line antimicrobial therapy

Improvement after 3-5 days

Worsening or no improvement after 3-5 days

7 Days?

Improvement after 3-5 days

Complete 5-7 days of antimicrobial therapy

Broaden coverage or switch to different antimicrobial class

Complete 7-10 days of antimicrobial therapy

Improvement

Worsening or no improvement after 3-5 days

Improvement

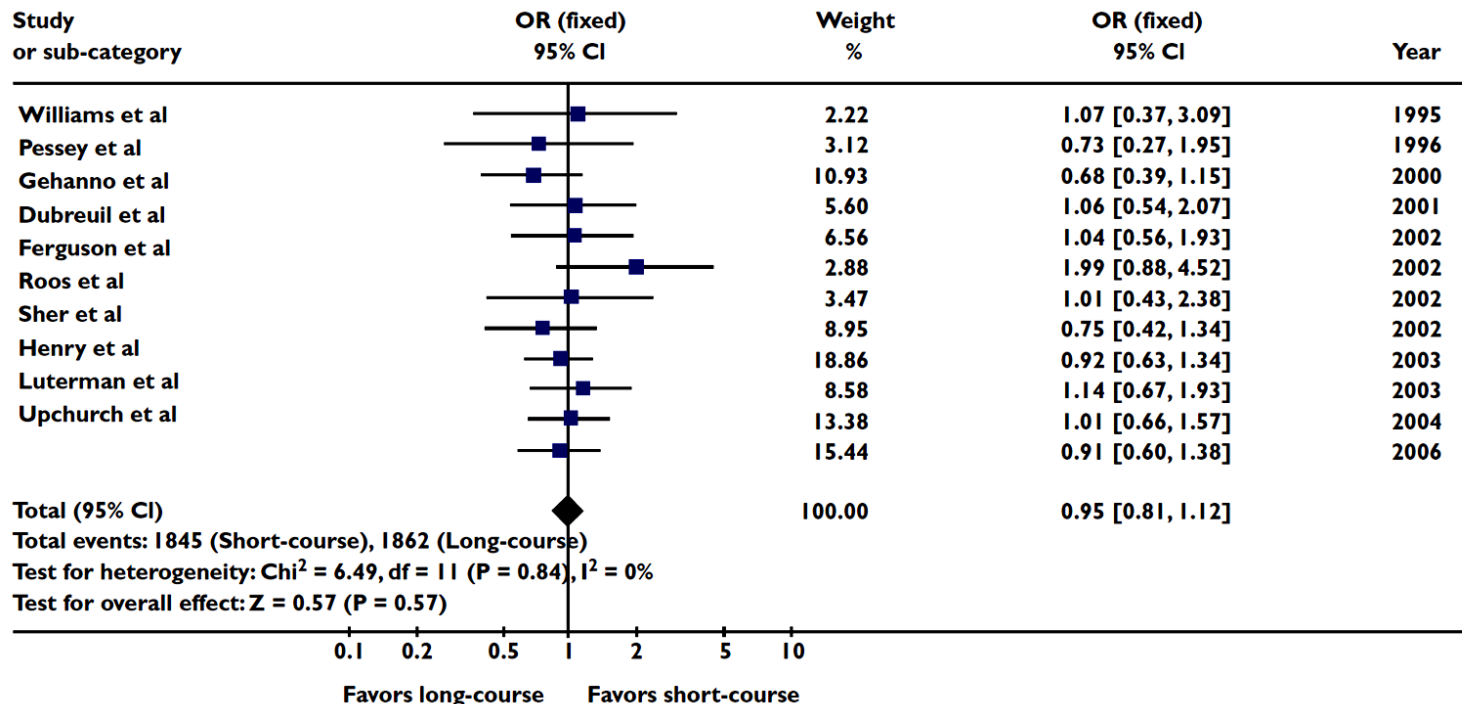
Complete 5-7 days of antimicrobial therapy

Refer to specialist

Complete 7-10 days of antimicrobial therapy

- CT or MRI to investigate noninfectious causes or suppurative complications
- Sinus or meatal cultures for pathogen-specific therapy

Effectiveness and safety of short vs. long duration of antibiotic therapy for acute bacterial sinusitis



- Short-course antibiotic treatment had comparable effectiveness to a longer course of therapy for ABS.
- Shortened treatment, particularly for patients without severe disease and complicating factors, might lead to fewer adverse events, better patient compliance, lower rates of resistance development and fewer costs.

Maxillary Sinus Puncture

- Culture is not generally recommended for the routine work-up of uncomplicated ARS except in the event of treatment failure or complications
- Sinus aspiration: gold standard for describing the microbiology of acute bacterial sinusitis $\geq 10^4$ CFU/ml.
- Invasive, time-consuming, and potentially painful procedure
- Nasal, nasopharyngeal, and pharyngeal cultures (surface cultures) cannot be used as surrogates for a maxillary sinus aspirate

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 (%)
1 <i>Streptococcus pneumoniae</i>	30–43	44	38	21–33
2 <i>Haemophilus influenzae</i>	31–35	30	36	31–32
3 <i>Moraxella catarrhalis</i>	2–10	30	16	8–11
4 <i>Streptococcus pyogenes</i>	2–7	2	4	...
5 <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

Studies of Bacteriological Culture In Acute Rhinosinusitis in Thailand, 1986 - 2003

Authors/sites of study	Year of Study	Participants (Number of cases/ number of sinus aspirates)	Methods of specimen collection	Results	Note
					THAILAND
Foanant et al. / Maharaj Nakorn Chiang Mai ⁶	1986-1987	Adults- Acute 6/6	MST	Acute - Growth 5/6 (83.3%) (7 bacterial isolates) - <i>S. pneumoniae</i> 4/7 - <i>H. influenzae</i> 1/7	Culture positive 65-83% • Aerobe 50-70% • Anaerobe 2-15% • Mixed 4-10%
Prakunhangsit et al./ Ramathibodi Hospital ⁷	1992-1993	Acute rhinosinusitis, age 13- 65 years (40/45)	MST	- Growth 36/45 (80%) (48 bacterial isolates) anaerobe 2.2%, aerob - <i>H. influenzae</i> 20/48 - <i>S. pneumoniae</i> 5/48 - <i>Streptococcus</i> spp.	Aerobe • <i>H. Influenzae</i> 14-42% (Beta-lactamase-20-73%) • <i>S.pneumoniae</i> 9-57% • <i>Streptococcus</i> spp. 17-21% • <i>M. Catarrhalis</i> 2%
Kongkaew et al./ Ramathibodi Hospital ⁸	1998-1999	Acute & subacute rhinosinusitis, ages 16-65 years (39/47)	MST	Acute & subacute - Growth 74.47% (33) (53 bacterial isolates) anaerobe 14.89%, aer 4.26 %) - <i>H. influenzae</i> 11/53 - <i>S. pneumoniae</i> 6/53 - <i>Streptococcus</i> spp.	
Charoencharsri et al./ Siriraj Hospital ⁹	1999-2000	Adults - Acute rhinosinusitis (48/48)	MST	- Growth 64.6% (31) (60 bacterial isolates) anaerobes 4.2%, aerob 10.4%) - <i>H. influenzae</i> 34.3% - <i>S. pneumoniae</i> 17.1% - <i>Streptococcus</i> spp.	WESTERN COUNTRIES
Moungthong et al./ Phramongkutklao Hospital ¹⁰	2002-2003	Adults - Acute rhinosinusitis (44/44)	MST	Growth 77.2% (34/44) isolates)(aerobes 70.4% aerobes + anaerobes 77.2% - <i>H. influenzae</i> 29.5% - <i>S. pneumoniae</i> 9% - <i>M. catarrhalis</i> 2.3%	Culture positive 50-60% 1. <i>S.pneumoniae</i> 30-43% 2. <i>H.influenzae</i> 31-35% 3. <i>M.catarrhalis</i> 2-10 % 4. <i>S.pyogenes</i> 2-7 % 5. <i>S.aureus</i> 2-3%

MST = Maxillary sinus tap

Bacteriologic Profile of Acute and Chronic Maxillary Sinusitis

	AMS (n=48)	AECS (n=16)	CMS (n=21)
Positive culture (%)	64.6	93.8	92.6
Total No. of bacterial isolates	60	40	65
No. of bacterial isolates/specimen	1.3	2.5	2.4
Aerobes (%)	50	56.3	25.9
Anaerobes (%)	4.2	31.3	22.2
Mixed (%)	10.4	6.2	44.4
Gram-positive bacteria (%)	47.2	29.4	32.0
Gram-negative bacteria (%)	52.8	70.6	68.0

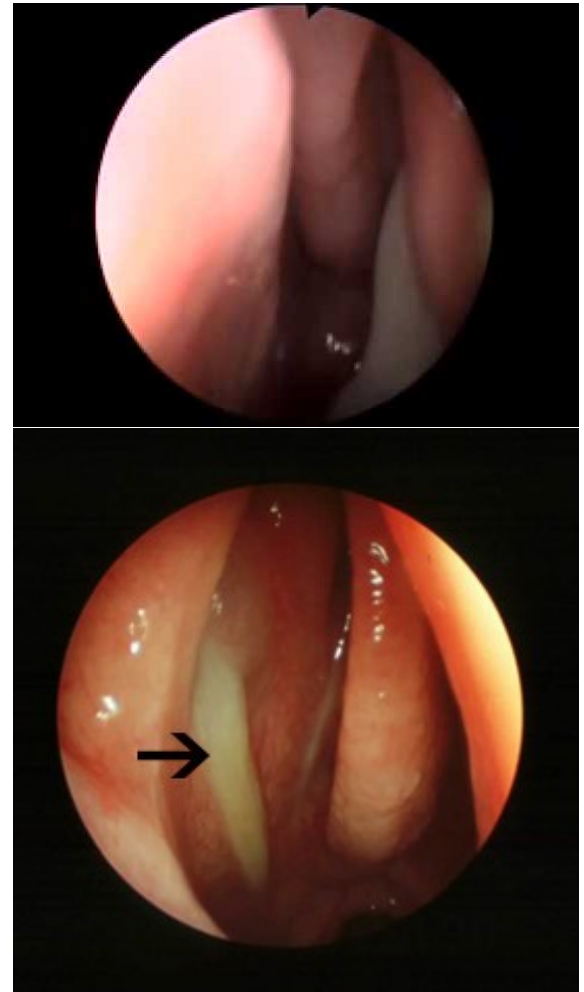
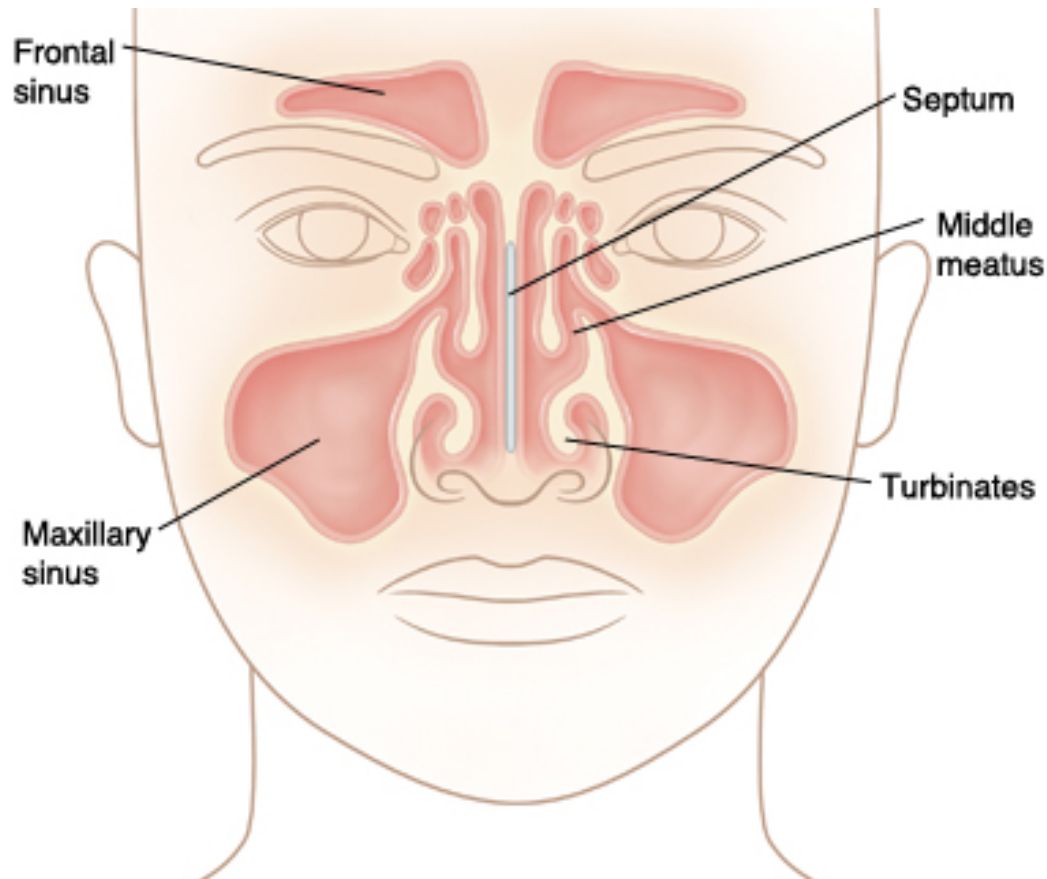
Note: AMS = acute maxillary sinusitis, AECS = acute exacerbation on chronic sinusitis,
CMS = chronic maxillary sinusitis.

- 1999-2000
- Maxillary antral aspiration using sterile technique.

Bacteriologic Profile of Acute and Chronic Maxillary Sinusitis

AMS (35 isolates)		AECS (17 isolates)		CMS (25 isolates)	
1	<i>H. influenzae</i> 34.3%	<i>P. aeruginosa</i> 23.5%	<i>H. influenzae</i> 28.0%		
2	<i>S. pneumoniae</i> 17.1%	<i>H. influenzae</i> 17.6%	NF. GNR 20.0%		
3	Other <i>Streptococcus</i> spp. 17.1%	<i>K. pneumoniae</i> 11.8%	<i>K. pneumoniae</i> 12.0%		
4	<i>P. aeruginosa</i> 11.4%	NF. GNR 11.8%	β -hemo. <i>Strep.</i> 8.0%		
5	<i>S. aureus</i> 5.7%	Other <i>Streptococcus</i> spp. 11.8%	<i>S. aureus</i> 8.0%		
AMS (25 isolates)		AECS (23 isolates)		CMS (40 isolates)	
<i>Peptostreptococcus</i> spp.	28.0%	<i>Fusobact.</i> spp.	34.8%	Non-spore forming GPR	30.0%
<i>Fusobacterium</i> spp.	28.0%	<i>Peptostrep</i> spp.	21.7%	<i>Peptostreptococcus</i> spp.	27.5%
<i>Bacteroides</i> spp.	20.0%	<i>Prevotella</i> spp.	13.0%	<i>Fusobacterium.</i> spp.	22.5%
<i>Prevotella</i> spp.	8.0%	<i>Bacteroides</i> spp.	8.7%	<i>Bacteroides</i> spp.	10.0%
<i>Tissierella</i> spp.	8.0%	<i>Tissierella</i> spp.	4.3%	<i>Porphyromonas</i> spp.	5.0%

Culture of the Middle Meatus??



Hair follicles: a niche of *S.aureus* in the nose

Internal nares
Ciliated pseudostratified
columnar epithelium

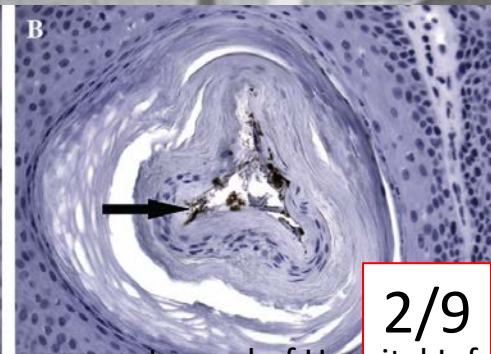
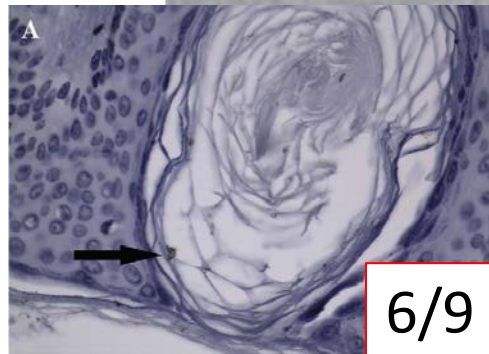
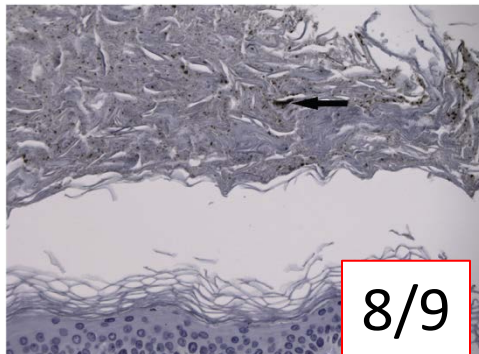
0/9

S. aureus colonization : 9/37 human cadavers

Vestibulum nasi
Stratified squamous
epithelium

8/9

EXTERNAL
OPENING OF
RIGHT NOSTRIL



Cultures of the Middle Meatus in Healthy Adults

Organisms	Percent
• Coagulase-negative Staphylococci	32-72
• <u><i>S.aureus</i></u>	<u>8-24</u>
• <i>Corynebacterium</i> spp.	0-24
• <i>Propionibacterium</i> acnes	0-13
• Other	0-18

Endoscopically Middle Meatal Swab Culture in Normal Subject (THAILAND)

- 53 participants
- M 23: F 30
- Mean age 23 years (19-57)
- Positive culture from Endoscopically middle meatal swab culture = 94.3%
- Single organism 66%
- Multiple organisms 28.3%



Aerobic bacteria

66/66 (100 %)

Gram positive

55/66 (83.33%)

1. *S.epidermidis* 57.6 %

2. *S.aureus* 12.0 %

3. *Corynebacterium spp.* 9.0 %

4. *Bacillus sp.*

2 (very rare)

5 *Coagulase-negative
staphylococci*

1 (very rare)

Gram negative

11/66 (16.67%)

1. *Citrobacter diversus*

3 (rare 1,very rare 2)

2. *Klebsiella pneumoniae*

3 (very rare)

3. *Enterobacter aerogenes*

3 (very rare)

4. *Providencia rettgeri*

1 (very rare)

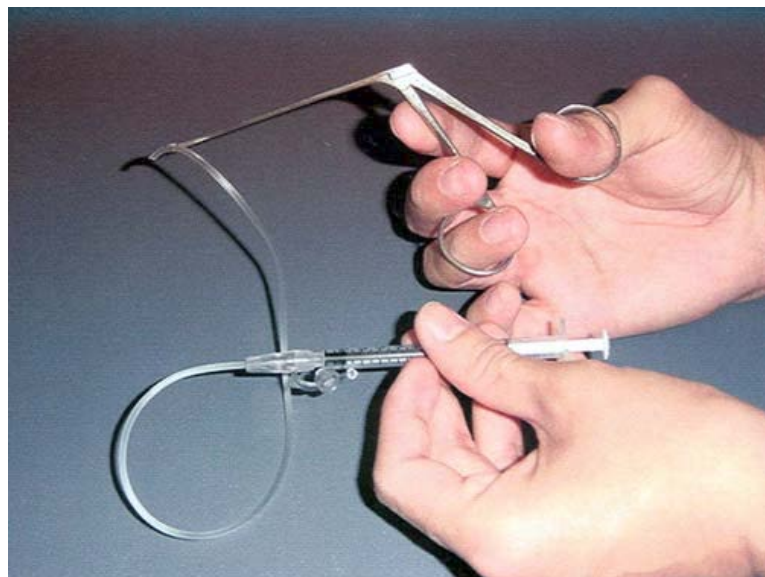
5. *Micrococcus sp.*

1 (very rare)

นายแพทย์จอมพล ตันตระวรศิลป์ 2550

แพทย์ประจำบ้าน ภาควิชา โสิต ศอ นาสิกวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์

A Comparison between Endoscopically Middle Meatal Aspiration Culture Using Modified Aspiration Instrument and Direct Maxillary Antral Tap Culture in Chronic Rhinosinusitis



- Nasal vestibules, anterior nasal cavity and adjacent face were disinfected for 10 minutes with 10% povidine iodine solution and removed with a moist swab
- After the application of topical 1% ephredine, discharge was taken directly from the middle meatus close to the maxillary ostium into 1 cc tuberculin syringe via pediatric scalp vein catheter
- While performing these procedures, the catheter tip was grasped with alligator forceps and carefully pointed to the middle meatus without touching the adjacent structures

No.	Sex	Age	EMAC	ATC	Correlation
1	Female	15	- Coagulase-negative staphylococcus	- Alpha streptococcus not gr D	None
2	Male	15	- Staphylococcus aureus	- Citrobacter diversus	Strong
3	Male	18	- Coagulase-negative staphylococcus	- Staphylococcus aureus	Moderate
4	Male	19	- Coagulase-negative staphylococcus	- Coagulase-negative staphylococcus	Moderate
5	Male	24	- Pseudomonas aeruginosa	- Escherichia coli	Moderate
6	Male	24	- Klebsiella pneumoniae	- Pseudomonas aeruginosa	None
7	Male	24	- Staphylococcus aureus	- Micrococcus spp.	None
8	Male	24	- Proteus mirabilis	- Staphylococcus aureus	None
9	Male	24	- Klebsiella pneumoniae	- Peptostreptococcus productus	None
10	Female	39	- Coagulase-negative staphylococcus	- Alpha Streptococcus not gr D	Moderate
11	Female	41	- Staphylococcus aureus	- Coagulase-negative staphylococcus	Moderate
12	Female	41	- Staphylococcus aureus	- Escherichia coli	Moderate
13	Male	44	- Coagulase-negative staphylococcus	- Staphylococcus aureus	Strong
14	Male	44	- Enterobacter aerogenes	- Pseudomonas aeruginosa	Strong
15	Male	47	- Alpha Streptococcus not gr.D	- Coagulase-negative staphylococcus	Strong
16	Female	47	- Coagulase-negative staphylococcus	- Enterobacter aerogenes	Strong
17	Female	47	- Coagulase-negative staphylococcus	- Alpha Streptococcus not gr D	Strong
18	Female	54	- Eubacterium contorium	- Coagulase-negative staphylococcus	None
19	Female	62	- Klebsiella pneumoniae	- Coagulase-negative staphylococcus	Moderate
20	Male	64	- Coagulase-negative staphylococcus	- Klebsiella pneumoniae	Moderate
21	Male	64	- Coagulase-negative staphylococcus	- Microaerophilic streptococcus	Moderate
22	Male	65	- No growth	- Coagulase-negative staphylococcus	Strong
23	Male	66	- Beta Streptococcus not gr A, B,D	- Klebsiella pneumoniae	Strong
24	Male	66	- Beta Streptococcus not gr A, B,D	- No growth	Strong
25	Male	66	- Beta Streptococcus not gr A, B,D	- Beta Streptococcus not gr A, B, D	Strong

The association between EMAC and ATC among patients with chronic rhinosinusitis was strong to moderate (13/16) 81.25%.

Characteristics of and Culture Rates in 25 Antibiotic Studies of Acute Bacterial Rhinosinusitis.

Article (year)	Data method ^a	Culture type	Location	Age, mean years	Male sex, %	Total no. of patients	No. of positive culture results	Total no. of isolates	Culture rate, %			
									<i>Streptococcus pneumoniae</i>	<i>Haemophilus influenza</i>	<i>Moraxella catarrhalis</i>	<i>Staphylococcus aureus</i>
Carenfelt et al. [7] (1990)	Pat	MST	Europe	...	...	351	213	243	23.9	38.3	6.2	7.0
Gauger et al. [8] (1990)	Pat	MST	Europe	40.4	51.2	41	20	29	27.6	17.2	0.0	0.0
Gehanno et al. [9] (1990)	Iso	MST	Europe	41.7	63.3	256	151	205	15.6	34.1	12.7	9.8
Casiano et al. [10] (1991)	Iso	MST	United States	37.9	50.0	38	38	43	4.7	0.0	4.7	16.3
Gehanno et al. [11] (1991)	Pat	MST/MM	France	46.1	45.2	73	50	76	19.7	28.9	15.8	7.9
Karma et al. [12] (1991)	Pat	MST	Europe	29.6	90.0	72	72	74	40.5	52.7	2.7	1.4
Camacho et al. [13] (1992)	Pat	MST	Americas	34.6	53.9	317	198	198	21.7	10.1	0.0	12.6
van den Wijngaart et al. [14] (1992)	Pat	MST	Europe	36.7	49.1	55	55	89	12.4	12.4	7.9	11.2
Anonymous [15] (1993)	Pat	MST	Europe	34.7	54.7	733	332	332	41.3	34.9	7.2	2.1
Huck et al. [16] (1993)	Pat	MST	United States	...	...	81	65	94	21.3	19.1	5.3	10.6
Matthews et al. [17] (1993)	Iso	MST	United States	43.0	44.9	...	...	77	11.7	24.7	1.3	7.8
Von Sydow et al. [18] (1995)	Pat	MST	Europe	33.0	52.1	282	161	176	29.5	42.6	3.4	5.7
Chatzimanolis et al. [19] (1998)	Pat	MST	Greece	38.0	56.7	56	52	52	32.7	36.5	17.3	3.8
Clement et al. [20] (1998)	Pat	MM	...	40.9	40.6	254	153	153	28.1	26.1	8.5	13.1
Sydnor et al. [21] (1998)	Iso	MST/MM	United States	39.0	42.8	300	138	161	19.9	22.4	15.5	20.5
Klapan et al. [22] (1999)	Pat	MST	Croatia	32.5	77.0	70	47	52	13.5	44.2	11.5	30.8
Garrison et al. [23] (2000)	Iso	MST	United States	41.9	59.0	229	101	140	15.7	12.1	7.9	10.7
Siegert et al. [24] (2000)	Pat	MST/MM	Europe	40.3	44.6	493	257	321	29.9	23.7	7.8	8.1
Roos et al. [25] (2002)	Iso	MST	Europe	39 ^b	46.2	256	139	178	32.6	15.2	6.2	6.2
Buchanan et al. [26] (2003)	Iso	MST/MM	Multi	40 ^b	41.6	356	186	245	21.6	23.3	6.9	8.6
Klossek et al. [27] (2003)	Pat	MST/MM	Europe	40.4	46.7	452	191	224	33.5	20.1	5.8	14.3
Luterman et al. [28] (2003)	Pat	MST	Americas	38 ^b	40.9	...	24	24	33.3	25.0	4.2	0.0
Siegert et al. [29] (2003)	Iso	MST/MM	Europe	42.0	42.7	452	136	148	43.2	27.7	8.1	13.5
Weckx et al. [30] (2005)	Iso	MM	Brazil	...	65.3	49	36	44	29.5	36.4	11.4	6.8
Poole et al. [31] (2006)	Pat	MST/MM	United States	...	47.8	745	301	301	29.6	25.9	12.0	12.3

***S.pneumoniae* 32.7%, *H.influenzae* 31.6%, *S.aureus* 10.1%, *Moraxella catarrhalis* 8.8%**

Cultures of the Middle Meatus in 50 Healthy Children

Bacterial Species	Percentage
<i>Haemophilus influenzae</i>	40
<i>Moraxella catarrhalis</i>	34
<i>Streptococcus pneumoniae</i>	50
<i>Streptococcus pyogenes</i>	8
<i>Staphylococcus aureus</i>	20
<i>Streptococcus viridans</i>	30
<i>Neisseria</i> species	14
Coagulase-negative staphylococcus	30
<i>Corynebacterium</i> species	52
<i>Bacillus</i> species	16
<i>Peptostreptococcus</i> species	10
<i>Fusobacterium nucleatum</i>	2

Culture of The Middle Meatus

- Cultures of the middle meatus **may be used** as a reasonable surrogate for a maxillary sinus aspirate in adults with acute bacterial sinusitis if *interpretation is confined to the recovery of the usual sinus pathogens: S. pneumoniae, H. influenzae, and M. catarrhalis*
- These results cannot be translated to interpretation of cultures for *S. aureus* or coagulase-negative staphylococci
- Cultures of the middle meatus **cannot be used** as a surrogate for maxillary sinus aspiration in children with acute bacterial sinusitis

A Surveillance Bacteriological Study of Acute Bacterial Rhinosinusitis in Thailand and the Clinical Responses to the Culture-directed Antibiotics

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A Surveillance Bacteriological Study of Acute Bacterial Rhinosinusitis in Thailand and the Clinical Responses to the Culture-directed Antibiotics

- August 2006 and April 2007
- 7 tertiary hospitals in Thailand
- Patients with clinically diagnosed acute bacterial rhinosinusitis (ABRS)
- **Exclusion:**
 1. previously underwent nasal/paranasal sinus surgery
 2. had nosocomial infection
 3. were immunocompromised hosts
 4. received antibiotics within 7 days before enrolment
 5. presented with nasal polyps or nasal/paranasal tumors
 6. had odontogenic rhinosinusitis

A Surveillance Bacteriological Study of Acute Bacterial Rhinosinusitis in Thailand and the Clinical Responses to the Culture-directed Antibiotics

- 113 patients with clinically diagnosed ABRS
- mean age of 33.4 years (range 4-74 years)
- The average duration of symptoms: 11.7 days (range 2-30 days)
- 104 cases: bacteriological study
- Bacterial cultures:
 1. Maxillary sinus tap or
 2. Endoscopically directed middle meatus swabs
- The incidence of bacterial growth was 60.6%

Types of organism		n	% (95% CI)	MST	EDMMS
1	<i>H. influenzae</i>	21	25 (16.9-35.3)	10	11
	Beta-lactamase positive, non typeable	7	Beta-lactamase positive = 8/20 (40%)		
	Beta-lactamase negative, non typeable	12			
	Beta-lactamase positive, type B	1			
	Not tested for beta-lactamase	1			
2	<i>S. pneumoniae</i>	12	14.3 (8.2-23.5)		
	Non-PNSSP	2	PNSSP = 6/8		
	PNSSP	6			
	Not tested	4			
8	<i>M. catarrhalis</i>	2	2.4 (0.5-7.3)		
	Beta-lactamase negative	1			
	Beta-lactamase positive	1			
3	<i>S. aureus</i>	8	9.5 (4.7-17.9)		8
	<i>S. coagulase +ve</i>	2	2.3 (0.2-8.8)	1	1
	<i>S. coagulase -ve</i>	8	9.5 (4.7-17.9)	1	7
	<i>S. epidermidis</i>	1	1.2 (0.01-7.1)		1
5	<i>P. aeruginosa</i>	5	6.0 (2.2-13.5)	2	3
	<i>Pseudomonas spp.</i>	3	3.6 (1.2-8.9)		3
6	<i>K. pneumoniae</i>	4	4.8 (1.5-12.0)	3	1
7	<i>Enterobacter spp.</i>	4	4.8 (1.5-12.0)	1	3
	<i>Alpha-Streptococcus</i>	1	1.2 (0.01-7.1)		1
4	<i>S. viridans</i>	2	2.3 (0.2-8.8)	2	0
	<i>Streptococcus</i> group D	5	6.0 (2.2-13.5)	3	2
	<i>Enterobacter cloacae</i>	1	1.2 (0.01-7.1)		1
	<i>N. meningitidis</i>	1	1.2 (0.01-7.1)	1	
	<i>E. coli</i>	2	2.3 (0.2-8.8)		2
	<i>Corynebacterium spp.</i>	1	1.2 (0.01-7.1)		1
	<i>Proteus spp.</i>	1	1.2 (0.01-7.1)		1
	Total	84	0	32	52

WESTERN COUNTRIES		
Culture positive 50-60%		
1.	<i>S.pneumoniae</i>	30-43%
2.	<i>H.influenzae</i>	31-35%
3.	<i>M.catarrhalis</i>	2-10 %
4.	<i>S.pyogenes</i>	2-7 %
5.	<i>S.aureus</i>	2-3%

Total n for MST = 51 versus EDMMS = 53

Antimicrobial sensitivity of commonly used antibiotics against three main pathogens

Types of antibiotics	<i>S. pneumoniae</i> (n = 12)	<i>H. influenzae</i> (n = 21)	<i>M. catarrhalis</i> (n = 2)
Amoxicillin	S:6 (NT:6)	S:1, I:1, R:9	R:1 (NT:1)
Cotrimoxazole	S:3, I:1, R:3 (NT:5)	S:8, R:3 (NT:9)	S:1 (NT:1)
Amoxicillin/clavulanate	S:3 (NT:9)	S:18, I:1, R:1 (NT:1)	S:1 (NT:1)
Cefaclor	S:3 (NT:9)	S:7, I:2, R:2 (NT:10)	(NT:2)
Ampicillin/sulbactam	S:4 (NT:8)	S:16, R:4 (NT:1)	S:1 (NT:1)
Clindamycin	S:5, R:3 (NT:4)	S:1, I:1, R:3 (NT:16)	(NT:2)
Azithromycin	S:2, R:5 (NT:5)	S:12, I:1 (NT:8)	(NT:2)
Clarithromycin	S:2, R:6 (NT:4)	S:13, I:1, R:1 (NT:6)	(NT:2)
Ofloxacin	S:7 (NT:5)	S:14 (NT:7)	(NT:2)
Levofloxacin	S:8 (NT:4)	S:16 (NT:5)	(NT:2)
Gatifloxacin	S:4 (NT:8)	S:11 (NT:10)	(NT:2)
Cefuroxime	S:4 (NT:8)	S:17, IR:1 (NT:3)	R:1 (NT:1)
Cefpodoxime	S:3 (NT:9)	S:11 (NT:10)	(NT:2)
Cefixime	S:3 (NT:9)	S:2 (NT:19)	(NT:2)
Cefdinir	(NT:12)	S:1 (NT:20)	(NT:2)

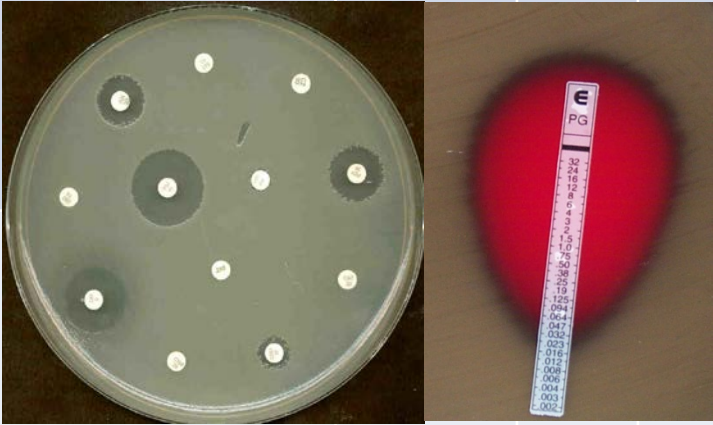
S = sensitive; I = intermediate resist; R = resist; NT = not tested

NARST, Thailand, 60 Hospitals, Jan-Sep 2015

H.influenzae

	Susceptibilities (%)					
	AMP	AMX/CLV	CFX	CTX	LVX	TET
• All isolates	55.1	92.4	93.2	98.3	99	52.6
• Age< 5yeas	46.7	92.2	-	98.3	100	54.7
• Age> 5 years	57	92.8	92.8	98.2	98.8	52.7
• Sterile site	46.4	91.8	-	100	-	44.1
• Non-sterile site	55.7	92.5	94	98.1	98.9	53.6

× × × Amoxicillin, Doxycycline × × ×

Antimicrobial Agent	Disk Content	Zone Diameter Interpretive Criteria			MIC Interpretive Criteria (µg/mL)		
		S	I	R	S	I	R
Penicillin	1 µg Oxacillin	≥20	Zones ≥ 20 mm: S (MIC ≤ 0.06) Zones ≤ 19 mm: R, I, or S?				
Penicillin parenteral (nonmeningitis)					≤2	4	≥8
Penicillin parenteral (meningitis)					≤0.06	-	≥0.12

NARST, Thailand, 60 Hospitals, Jan-Sep 2015

<i>S.pneumoniae</i>	Susceptibilities (%)						
	PEN	CTX	CLIN	ERY	TET	LVX	VAN
• All isolates	62.6*		69.8	65.2	25.8	99.8	99.9
• Age< 5yeas	50.6*		59.7	49.4	17.8	100	100
• Age> 5 years	63.6*		71.2	67.3	26.6	99.8	99.9
• Sterile site	66.3*		74.3	71.6	25.9	100	100
• Non-sterile site	61.3*		68.2	62.6	25.7	99.8	99.9
• Meningitis (E-test)	37.8	81.1					
• Non-meningitis (E-test)	91.1	98.1	High-dose AMX/CLV: PNS <i>S. pneumoniae</i> ≥10%				

* Oxacillin disk

✖ ✖ ✖ Amoxicillin(severe case), Azithromycin, Clarithromycin, Doxycycline ✖ ✖

NARST, Thailand, 60 Hospitals, Jan-Sep 2015

Organisms	Susceptibilities (%)					
<i>P.aeruginosa</i>	Ciprofloxacin	Levofloxacin	PIP/TAZ	Ceftazidime	Meropenem	Amikacin
• All isolates	81.5	79.2	80.3	79.2	78.8	87
<i>S.aureus</i>	PEN	LVX	CLIN	ERY	TET	VAN
• MSSA	7.5	93.5	93.6	93.9	49.6	100
• MRSA	0	13.4	8.6	9.5	23.8	98.3
<i>K. pneumoniae</i>	AMX/CLV	CFX	CTX	LVX	PIP/TAZ	MER
• Outpatient	70.2	66.4	69.2	77.8	77.2	99.6

Antimicrobial Regimens for Acute Bacterial Rhinosinusitis in Adults

Indication	First-line (Daily Dose)	Second-line (Daily Dose)
Initial empirical therapy	● Amoxicillin-clavulanate (500 mg/125 mg PO tid, or 875 mg/125 mg PO bid)	● Amoxicillin-clavulanate (2000 mg/125 mg PO bid)
β-lactam allergy		● Doxycycline (100 mg PO bid or 200 mg PO qd) ● Doxycycline (100 mg PO bid or 200 mg PO qd)
Risk for antibiotic resistance or failed initial therapy		● Levofloxacin (500 mg PO qd) ● Moxifloxacin (400 mg PO qd) ● Amoxicillin-clavulanate (2000 mg/125 mg PO bid)
Severe infection requiring hospitalization		● Levofloxacin (500 mg PO qd) ● Moxifloxacin (400 mg PO qd) ● Ampicillin-sulbactam (1.5–3 g IV every 6 h)
		● Levofloxacin (500 mg PO or IV qd) ● Moxifloxacin (400 mg PO or IV qd) ● Ceftriaxone (1–2 g IV every 12–24 h) ● Cefotaxime (2 g IV every 4–6 h)

Fluoroquinolones are associated with a variety of adverse effects including central nervous system events (seizures, headaches, dizziness, sleep disorders), peripheral neuropathy, photosensitivity with skin rash, disorders of glucose homeostasis (hypoglycemia and hyperglycemia), prolongation of QT interval, hepatic dysfunction, and skeletomuscular complaints

Topics

1. Are we really need an antibiotic for the management of acute uncomplicated rhinosinusitis in adults?
2. Can we believe the results of endoscopically directed cultures of the middle meatus in patients with rhinosinusitis?
3. What are the three most common causative bacteria for acute rhinisinusitis in Thai population?
4. Current in vitro susceptibility data of common causative organisms for acute bacterial rhinosinusitis

ขอบคุณครับ