



**Bundeswehr-
krankenhaus**
Hamburg

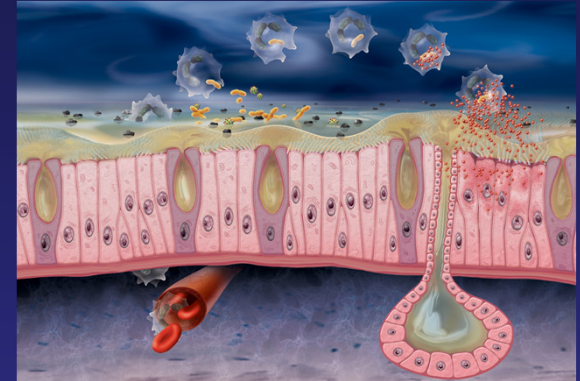
Acute Sinusitis – Treatment and Management with Mucolytic Agents

Armed Forces Hospital Hamburg
ENT Department

Professor Dr. med. habil. Thorsten Zehlicke

Upper respiratory tract virus infection (URI)

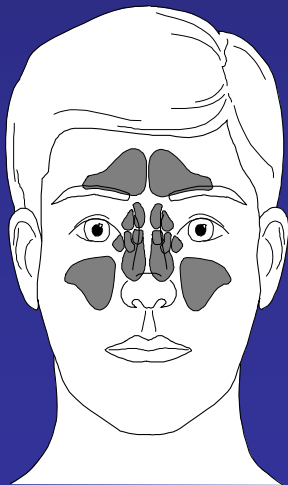
- Inflammation of the nasal mucosa
- Duration of disease < 14 Tage
- Symptoms:
 - blocked nose, nasal congestion
 - clear or purulent nasal discharge
 - post nasal drip



...may lead to an Acute Sinusitis

Acute Sinusitis

- Nasal discharge and sinus congestion depends on the infection
- 5 – 7 day´s after URI, most viral, bacterial (0,5 - 2 %):
Streptococcus pneumoniae und Haemophilus influenzae



Pathogenesis

The paranasal sinuses are joined to the nasal cavity via small ostia

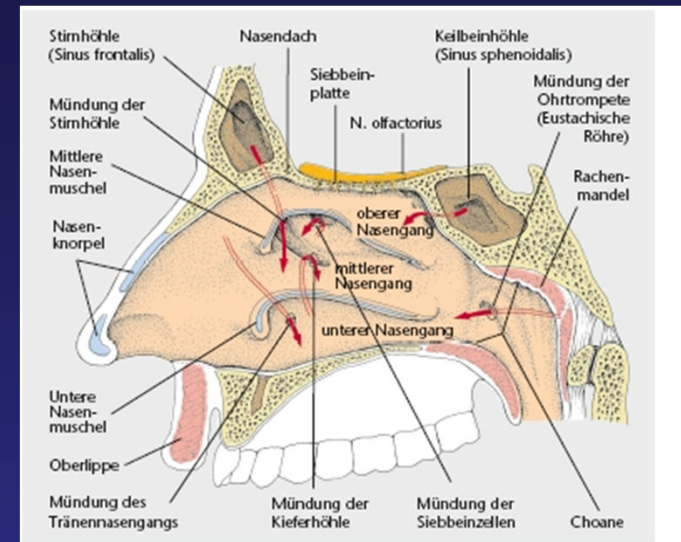
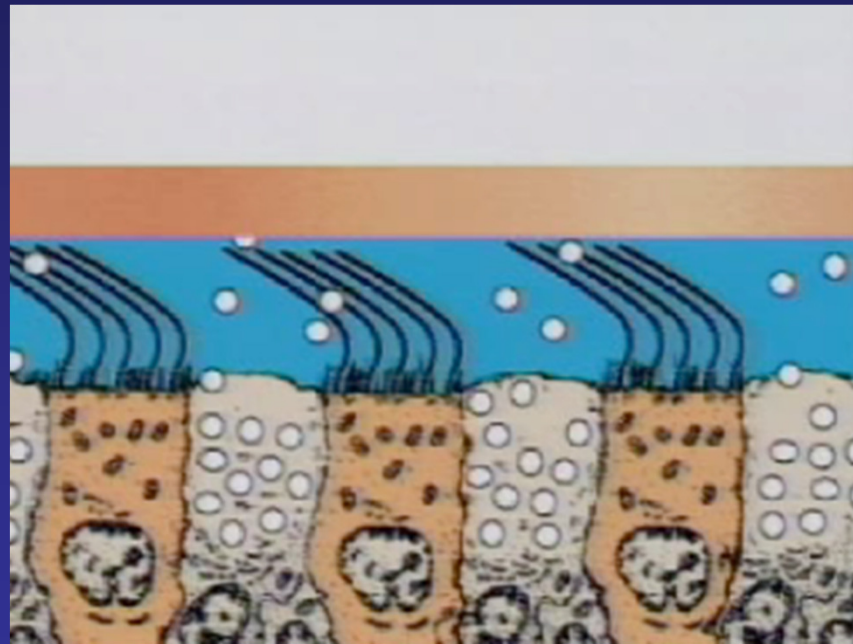


Abb. 16.2 Schnitt durch die Nasenhöhle. Die Nasenhöhle hat über Gangsysteme Verbindung zu verschiedenen Knochenhöhlräumen.

Huch; Jürgens: Mensch Körper Krankheit, 6. A., Elsevier GmbH 2011

Ostia become blocked easily by allergic disease, inflammation, or by swelling in the nasal lining that occurs with a cold. If this happens, normal drainage of mucus within the sinuses is disrupted, and sinusitis may occur.

Paranasal sinuses are lined with respiratory epithelium



Diagnosis of acute Sinusitis

- Diagnosis is usually based on history and examination findings
- Only few clinical findings suggest a clear diagnosis (eg endoscopically proven Pus)
- Technical methods (CT, smear , etc.) are only conclusive

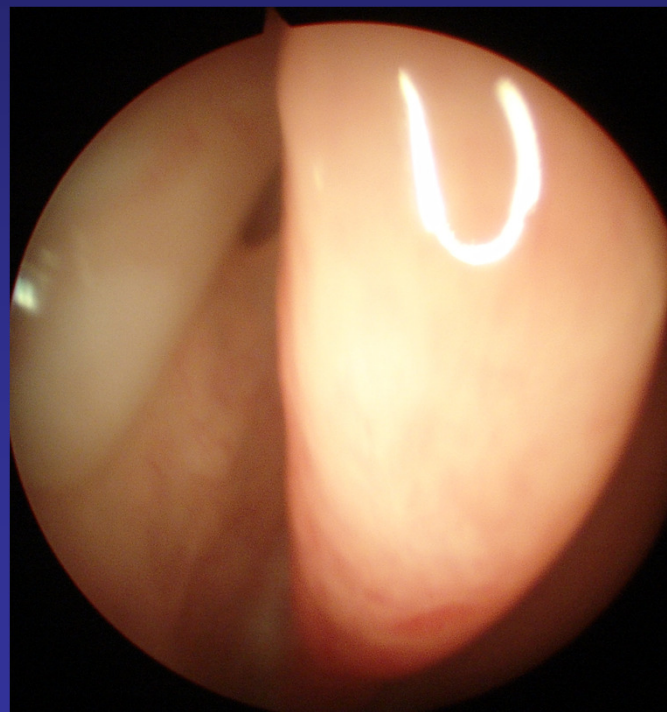
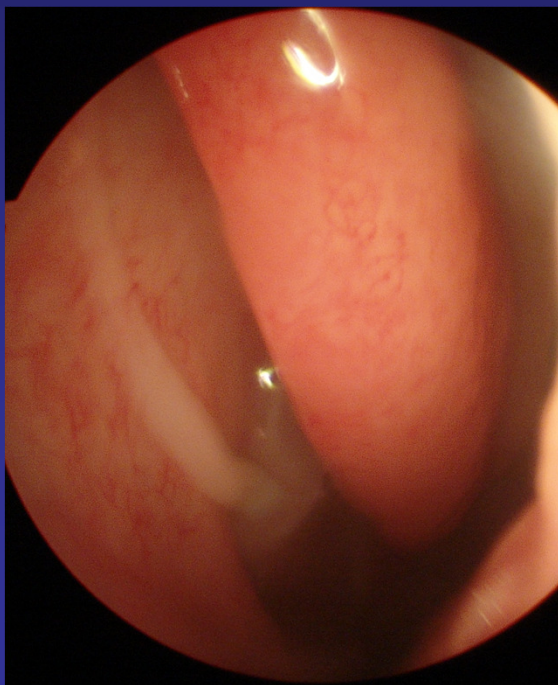


Diagnosis

- If no pain in the facial area and no complaints in the area of the nose (" blocked nose " rhinitis, hyposmia ,) are present , the diagnosis is very unlikely ("Evidenz"level IIc).
- One-sided pressure / or percussion tenderness over the sinuses and purulent rhinitis in the examination confirm the suspicion ("Evidenz"level IIc).

Diagnosis

- Some findings are almost conclusive : visible pus in the middle meatus at endoscopy , " purulent postnasal drip" and a premaxillary swelling ("Evidenz"level IIb).



How to avoid the development of acute sinusitis and how do I treat ?

Secretolysis ?

Antibiotics ?

Decongestant nasal therapy ?



Xylometazolin Spray

- Frequently prescribed in Germany
- Imidazole derivatives , alpha- sympathomimetic effect
- Contraction of vascular smooth muscles - narrowing of the vessels – decongestant effect
- Many publications on the improvement of nasal breathing during banal infection (PubMed 185 Publ. word search „xylometazoline nasal“)

Xylometazolin Spray

The therapeutic effect of nasal decongestants is scarcely been studied for acute rhinosinusitis , placebo-controlled studies are not available

Guideline German Society of Oto-Rhino-Laryngology,
Head and Neck Surgery
Rhinosinusitis

Antibiotic Therapy

Indications for antibiotic therapy in acute rhinosinusitis:

- severe symptoms
- Fever $> 38.5^{\circ} \text{C}$
- a gain of complaints over the disease
- a threatening complication
- Patients with chronic inflammatory lung disease immunodeficient or immunosuppressed patients
- Patients with serious underlying diseases or specific risk factors

Acute Sinusitis - Complications

- Periostitis , orbital cellulitis
- Meningitis , Encephalitis , epidural or subdural Empyema and intracranial Abscess
- Thrombosis of the sagittal sinus and cavernous sinus

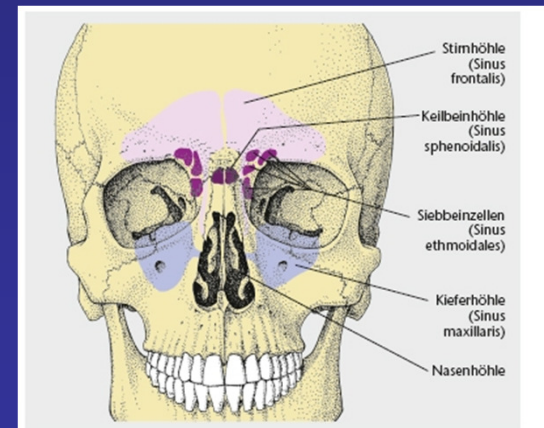


Abb. 16.3 Nasennebenhöhlen. Projektion der einzelnen Höhlen auf die vordere Schädeloberfläche.

Huch; Jürgens: Mensch Körper Krankheit, 6. A., Elsevier GmbH 2011

Antibiotics

First choice

Amoxicillin

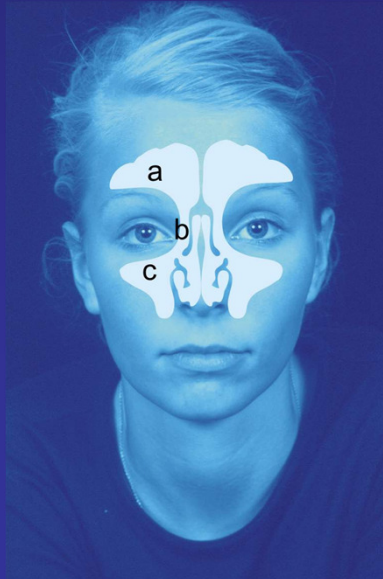
- Aminopenicillin + beta-Lactamase-Inhibitor, Oralcephalosporin 2
- Makrolid, Ketolid
- Cotrimoxazol
- Clindamycin, Doxycyclin
- Cephalosporin 3a, Moxifloxacin, Levofloxacin Ciprofloxacin



Antibiotics

Few placebo- controlled trials

Several meta- analyzes that compare different antibiotics against each other



Antibiotics

[Intervention Review]

Antibiotics for clinically diagnosed acute rhinosinusitis in adults

Marieke B Lemiengre¹, Mieke L van Driel^{1,2,3}, Dan Merenstein⁴, James Young⁵, An IM De Sutter^{1,6}

Analysis of 10 studies with 2450 patients

Shortening time of the disease (not significant)

Antibiotic therapy is not indicated (resistance and side effects , serious complications of ARS rarely)



Antibiotics

University, Cleveland, Ohio
Island (Dr Smith); Department
of Family Medicine and
Community Health, Center for
Health Services Research in
Primary Care, Case Western
Reserve University School of
Medicine, Cleveland, Ohio

better use of finite clinical resources. The
recommendation from the "top 5" list re-
garding treatment of sinusitis states:

Don't routinely prescribe antibiotics for acute mild
to moderate sinusitis unless symptoms (which
must include purulent nasal secretions AND max-
illary pain or facial or dental tenderness to palp-

Upper respira-
tions (URIs) invo-
oropharyngeal m-
tients with URIs h-
sinusitis,³ and vir-
of cases of acute r-

- Investigation of meta analysis of randomized placebo controlled trials of the last 10 years
- Only studies antibiotic therapy vs Placebo
- Little difference in the treatment time
- Significantly more side effects in the antibiotic
- group

Antibiotics

Rhinology. 2012 Mar;50(1):1-12. doi: 10.4193/Rhin.

EPOS 2012: European position paper on rhinosinusitis and nasal polyps 2012. A summary for otorhinolaryngologists.

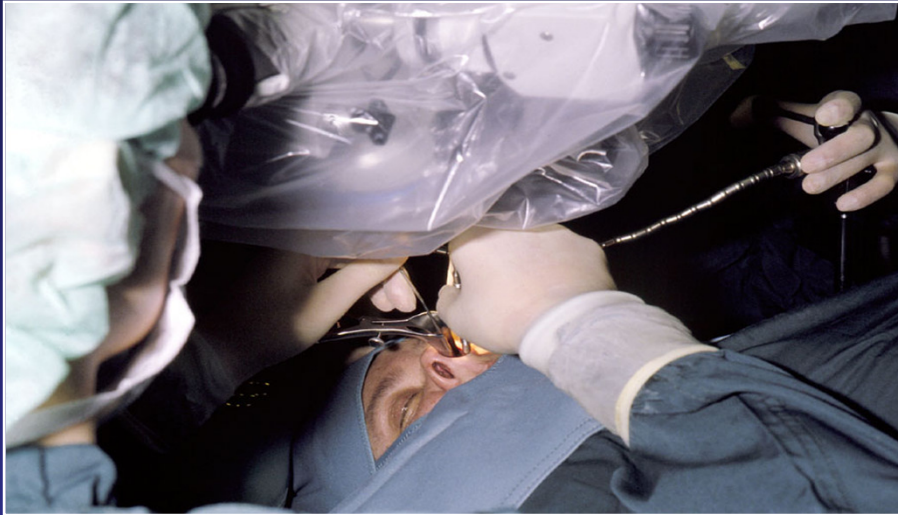
Fokkens WJ, Lund VJ, Mullol J, Bachert C, Alobid I, Baroody F, Cohen N, Cervin A, Douglas R, Gevaert P, Georgalas C, Goossens H, Harvey R, Hellings P, Hopkins C, Jones N, Joos G, Kalogjera L, Kern B, Kowalski M, Price D, Riechelmann H, Schlosser R, Senior B, Thomas M, Toskala E, Voegels R, Wang de Y, Wormald PJ.

Department of Otorhinolaryngology, Academic Medical Center, Amsterdam, the Netherlands. W.J.Fokkens@amc.uva.nl

Antibiotic therapy should be limited to serious disease states

Complications can not be reduced by antibiotic therapy

Therapy of Complications



Secretolysis

**Wirkung von Myrtol standardisiert*
bei der Therapie der akuten Sinusitis
– Ergebnisse einer doppelblinden,
randomisierten Multicenterstudie
gegen Plazebo**

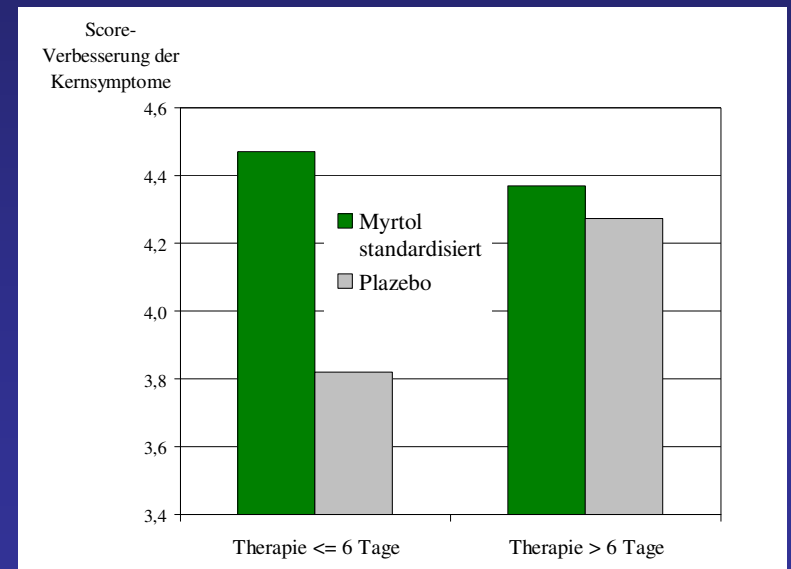
P. Federspil¹, R. Wulkow², Th. Zimmermann³

¹ Professor Dr. med. P. Federspil, Klinik und Poliklinik für HNO-Heilkunde der Universität des Saarlandes, Homburg/Saar (Direktor: Prof. Dr. med. H. Iro)

² Dr. med. R. Wulkow, Innovex (Biodesign) GmbH, Freiburg

³ Dr. med. Th. Zimmermann, G. Pohl-Boskamp GmbH & Co., Hohenlockstedt

- 331 patients with acute sinusitis
- Myrtol - Placebo - Essential oil
- Survey of symptom scores (SSC)
- Significant improvement of the SSC Myrtol over placebo with good tolerability
- A significant treatment effect is based on the symptom scores



Secretolysis

Der Einfluß des pflanzlichen Sekretolytikums Gelomyrtol® forte auf die mukoziliäre Clearance der Kieferhöhle*

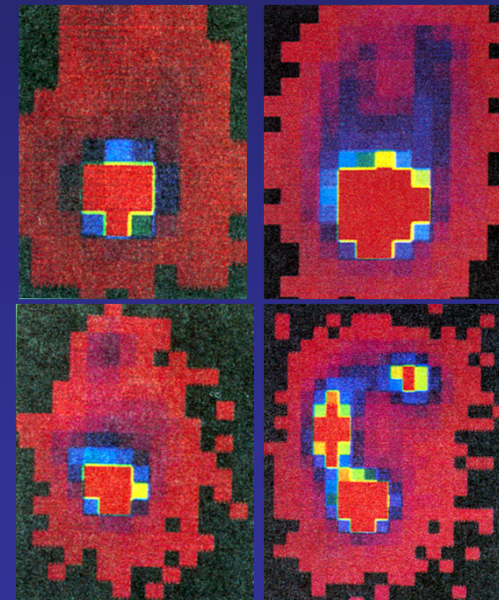
H. Behrbohm¹, O. Kaschke², Karin Sydow³

¹ Krankenhaus Berlin-Weißensee, HNO-Klinik (Chefarzt: Priv.-Doz. Dr. H. Behrbohm)

² Universitätsklinikum Charité der Humboldt-Universität zu Berlin, Hals-Nasen-Ohrenklinik (Direktor: Prof. Dr. H. J. Gerhardt)

³ Praxis für Nuklearmedizin (Praxisinhaber: Dr. sc. med. Karin Sydow) Berlin

- Sequenzszintigrafic study of four subjects for the detection of mucocilliare clearence equivalent before and after administration of Myrtol
- Unique increasing transportation rate after administration of Myrtol





***In vitro* studies of a distillate of rectified essential oils on sinonasal components of mucociliary clearance**

Yinyan Lai, M.D., Ph.D.,^{1,2} D. Dilidaer, M.D.,^{1,2} Bei Chen, M.D.,¹ Geng Xu, M.D.,² Jianbo Shi, M.D.,² Robert J. Lee, Ph.D.,¹ and Noam A. Cohen, M.D., Ph.D.^{2,3}

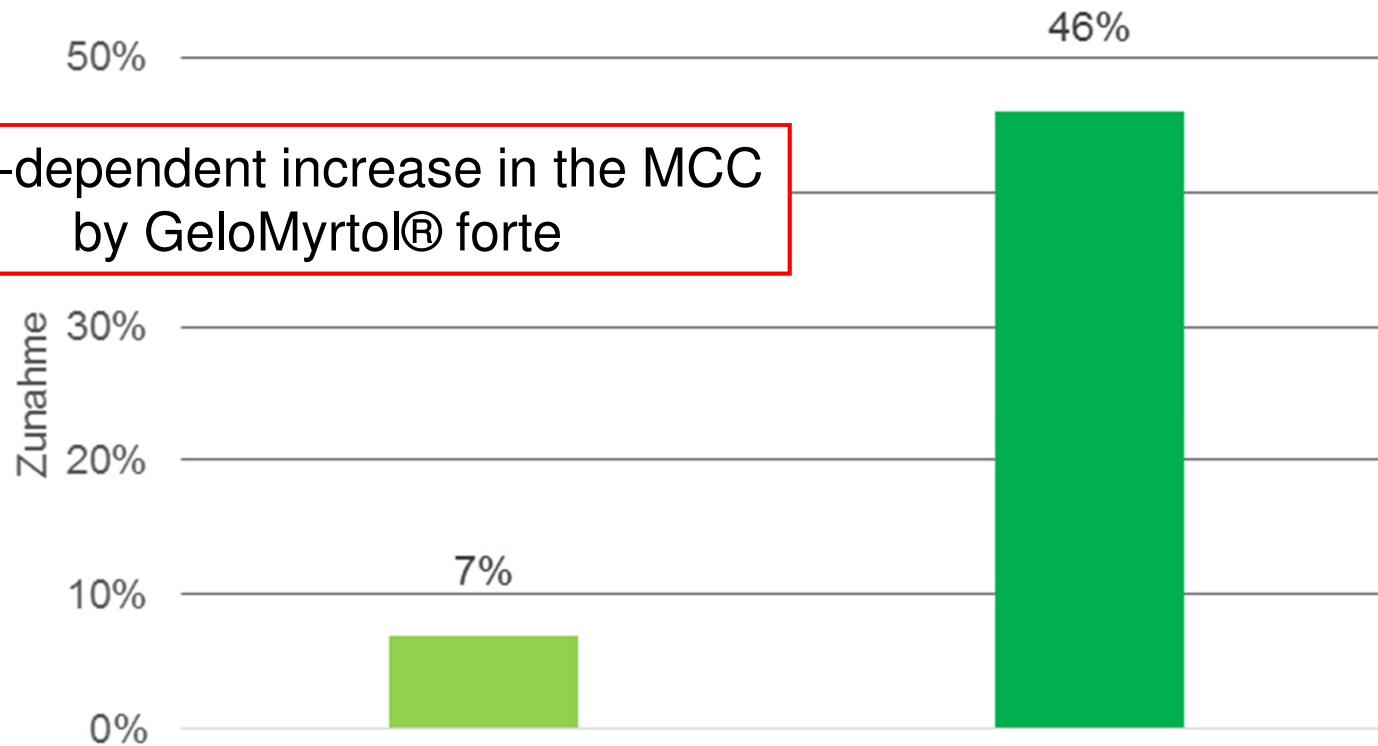
(Am J Rhinol Allergy 28, 244–248, 2014; doi: 10.2500/ajra.2014.28.4036)

Systematic study of the various factors influencing the MCC

Used cell cultures were obtained from sinus cells from human donors

In vitro studies of air-liquid interface (ALI) cultures

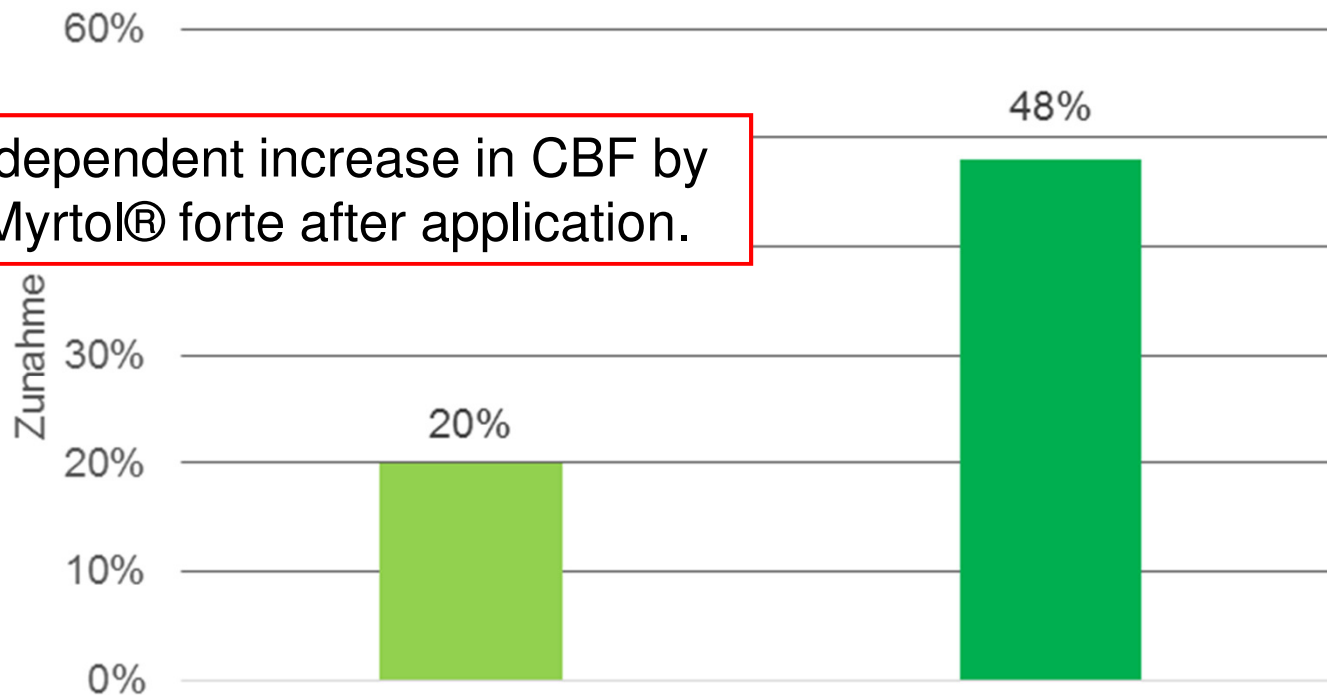
Influence on the transport speed of the mucus (mucociliary clearance)



Dose-dependent increase in the MCC
by GeloMyrtol® forte

CBF increase 30 min after exposure (ciliary beat frequency)

Dose-dependent increase in CBF by GeloMyrtol® forte after application.



Conclusions

- To treat a viral illness with antibiotics usually does not make sense
- Antibiotic therapy means little effect at relatively frequent adverse events
- Antibiotic therapy produces bacterial resistance
- Acute sinusitis in otherwise healthy patients is not an indication for antibiotic therapy , even with fever.

Conclusions

- There are many references to the good effectiveness of Myrtol for acute sinusitis
- Treatment with Myrtol means effect at relatively rare adverse events
- Proven secretolysis, higher transport speed of the mucus plus anti-inflammatory and antibacterial effect
- Meaningful and effective alternative to antibiotics without the typical side effects and resistance risks.