

THE ROLE OF INHALED CRENOTHERAPY IN RECURRENT PEDIATRIC RHINO-SINU-OTITIS



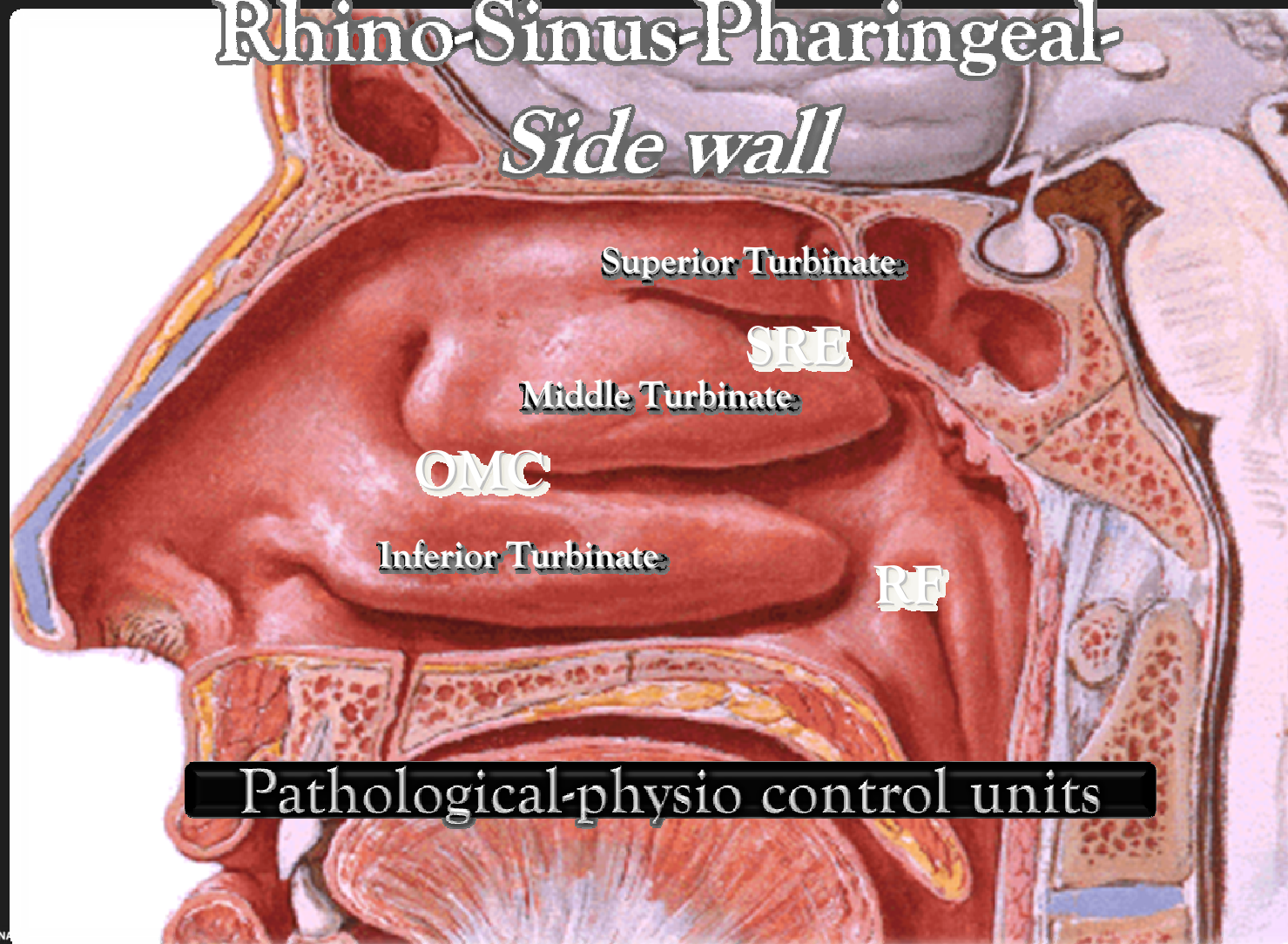
Dr. Enrico Ascione

RECURRENT RESPIRATORY INFECTIONS



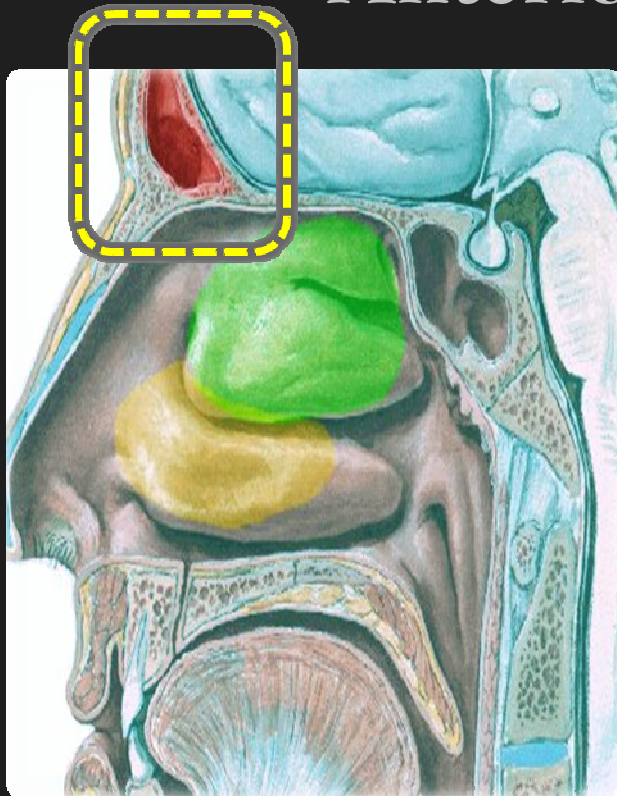
- ✧ Affects both upper and inferior airways
- ✧ > 6 respiratory infection in one year or more than one infection for month in september-april period
- ✧ Have an incidence of about 6% in the pre-school pediatric population.
- ✧ Viral etiology in the 70% of the cases

Rhino-Sinus-Pharyngeal *Side wall*

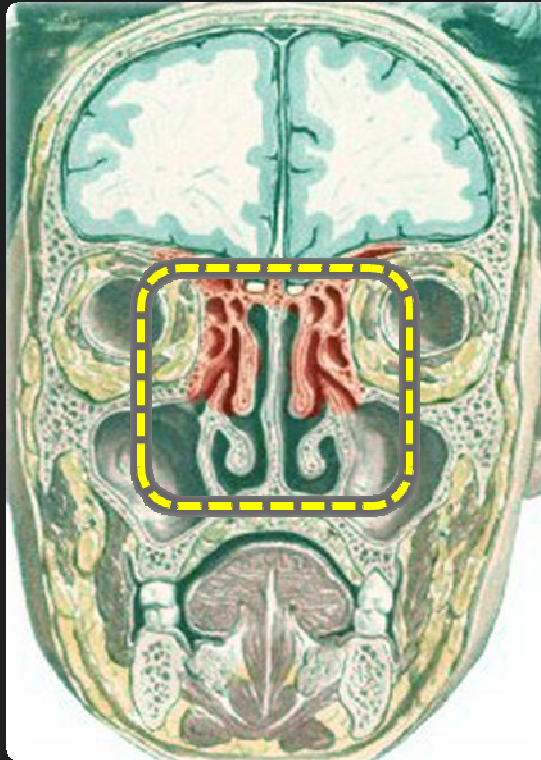


Pathological-physio control units

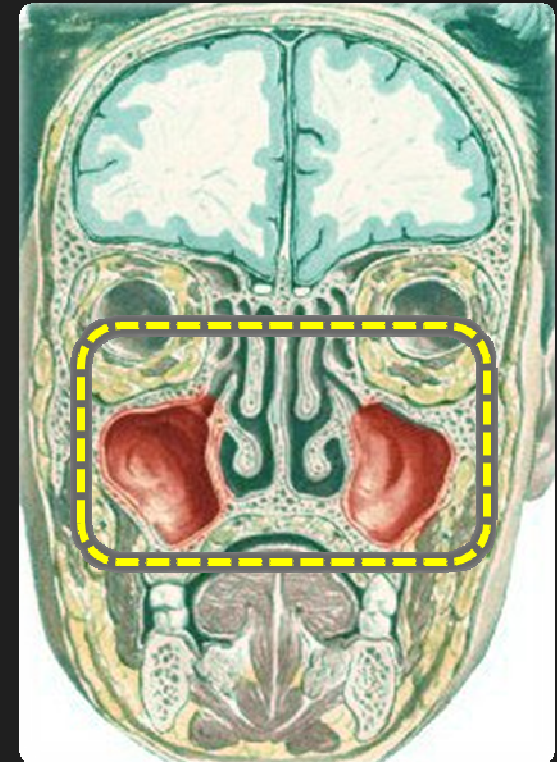
Anterior Rhino-Sinusal System



Frontal

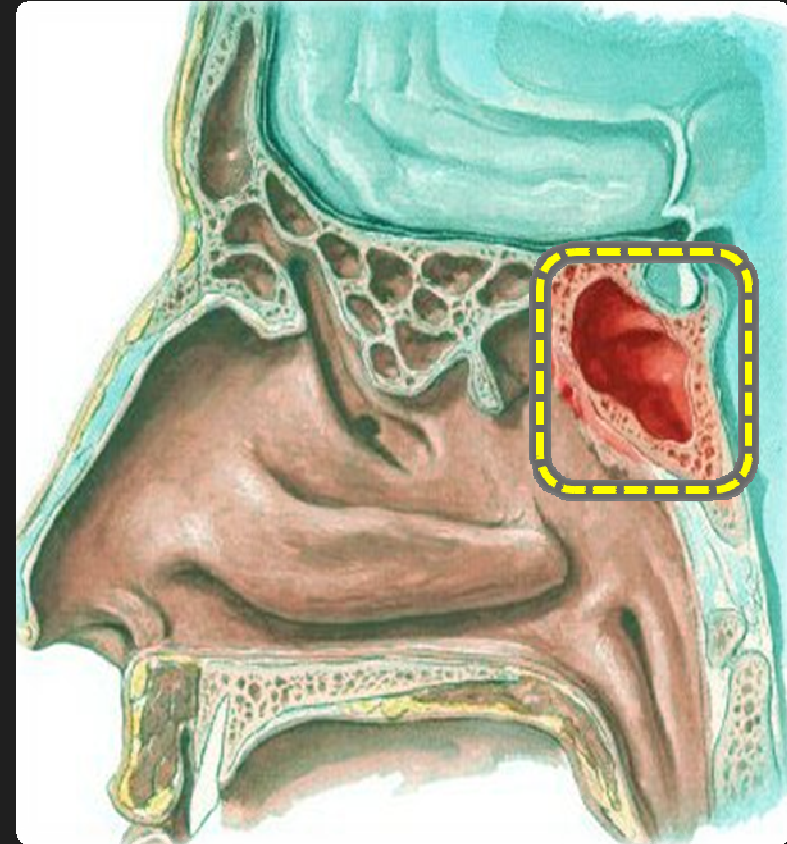
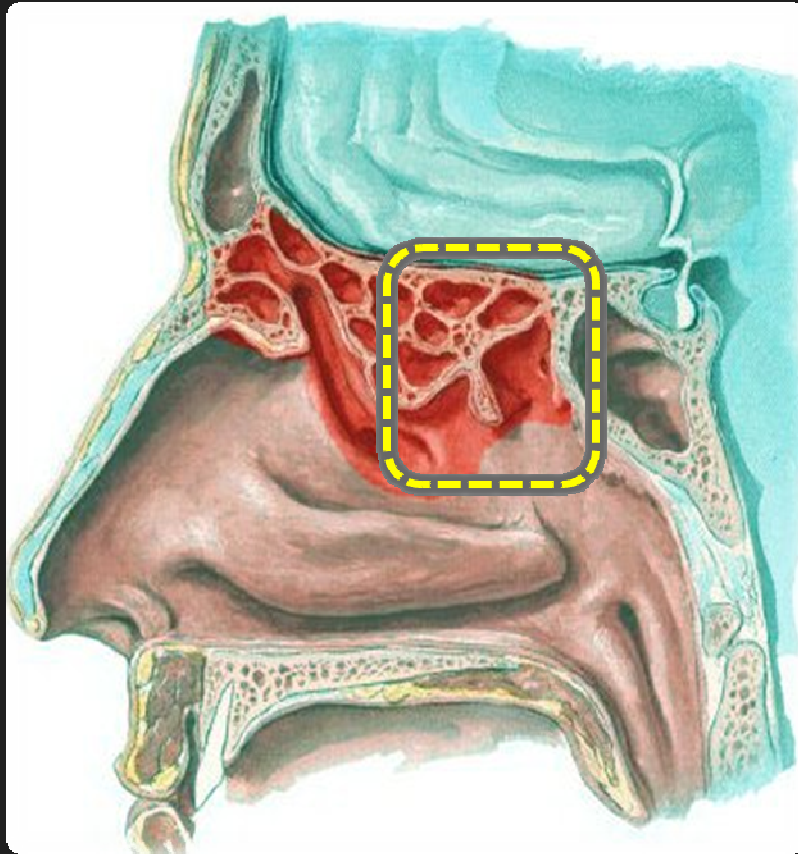


Ant Ethmoid



Maxillary

Posterior Rhino-Sinusal System



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VIE AEREE SUPERIORI

Post ethmoid

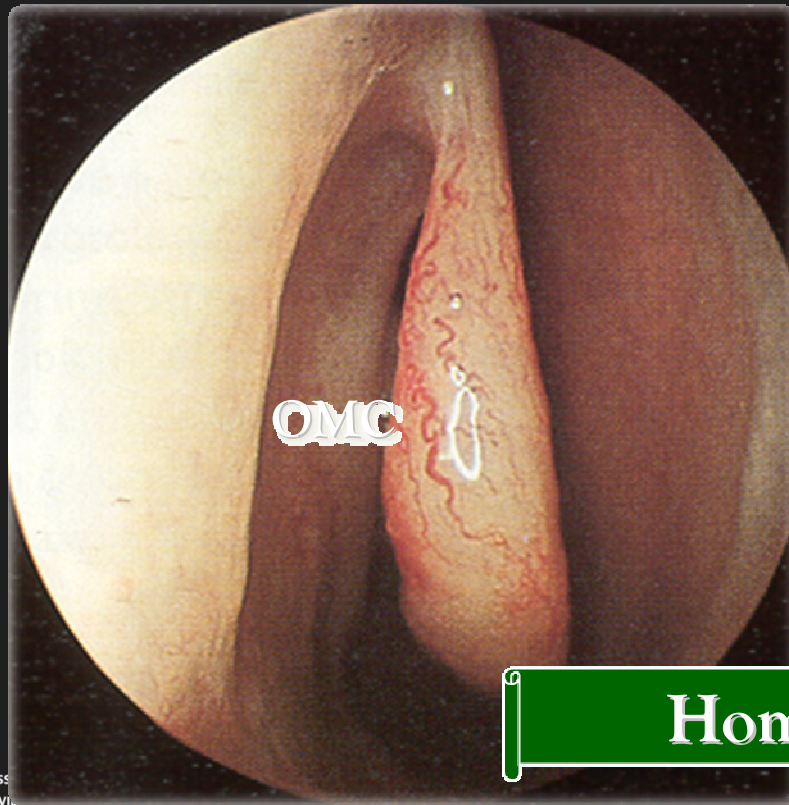
Sphenoid



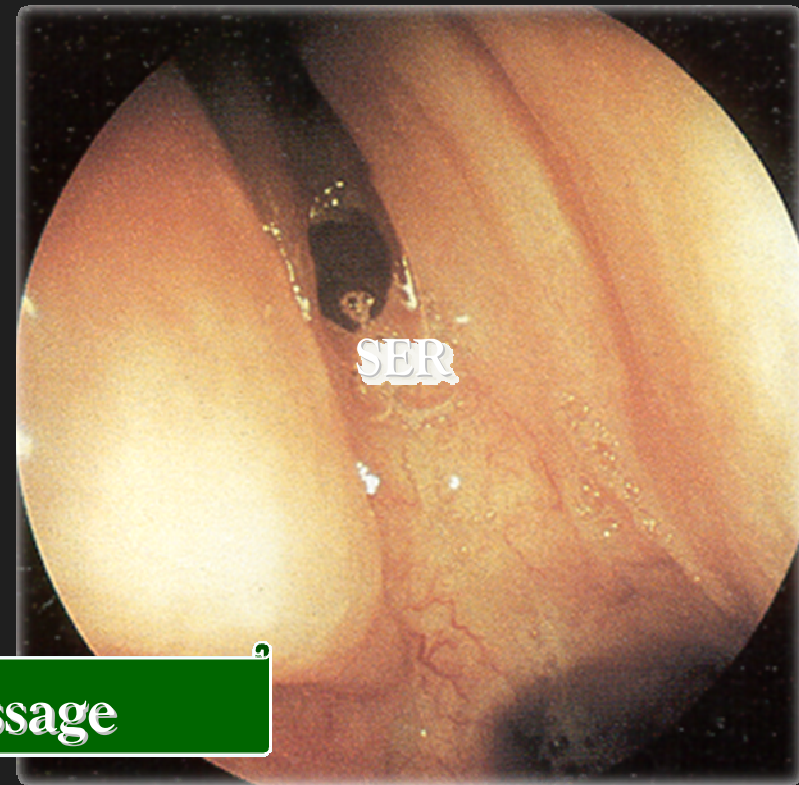
The nose and paranasal sinuses. Varricchio A., Ciprandi G. et al. IJIP, vol. 23, n° 1, 1-3, 2010.

Nose: the two 'control unit'

The OMC airs the **Anterior**
Rhino-Sinusal System



The SER airs the **Posterior**
Rhino-Sinusal System

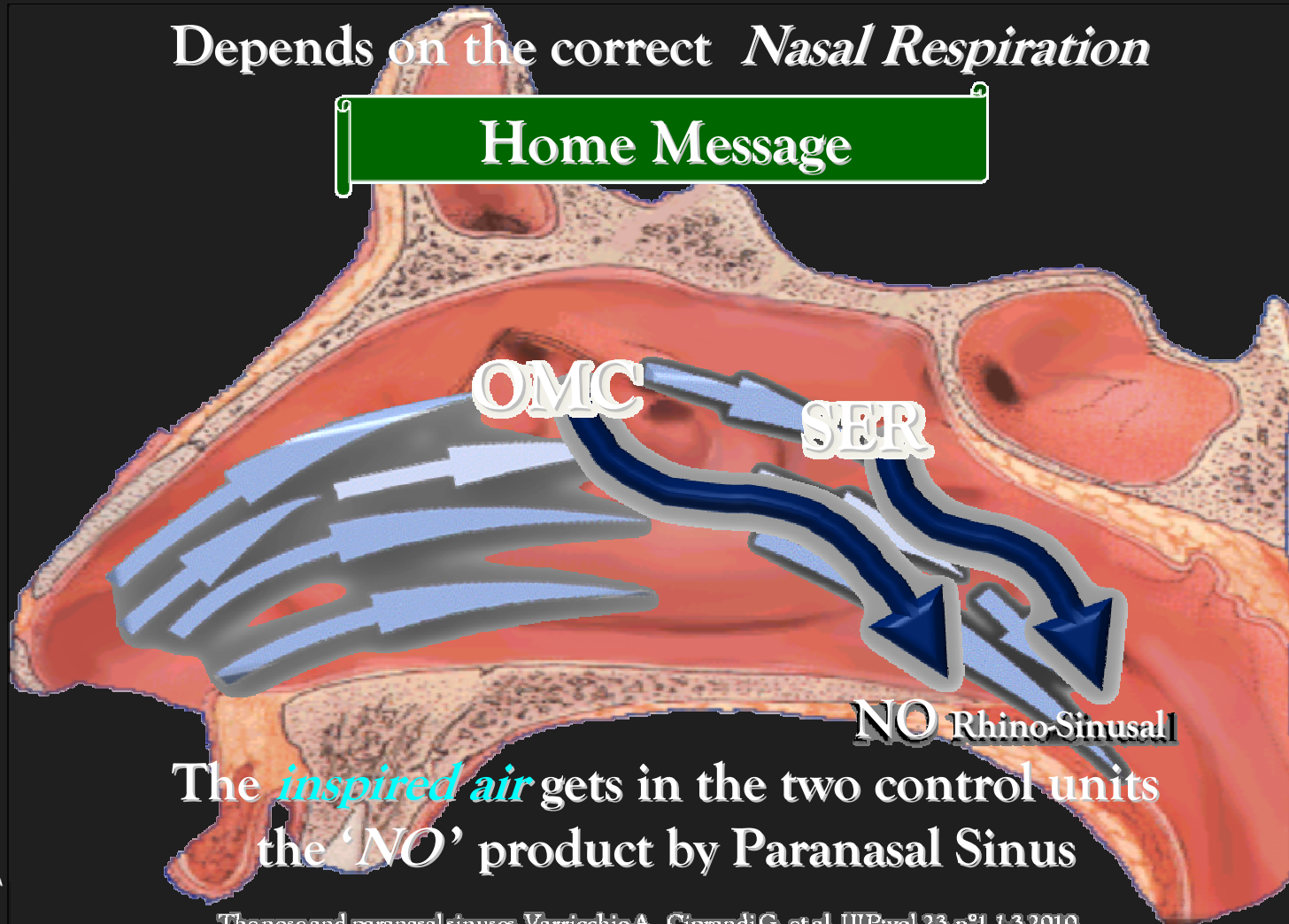


Home Message

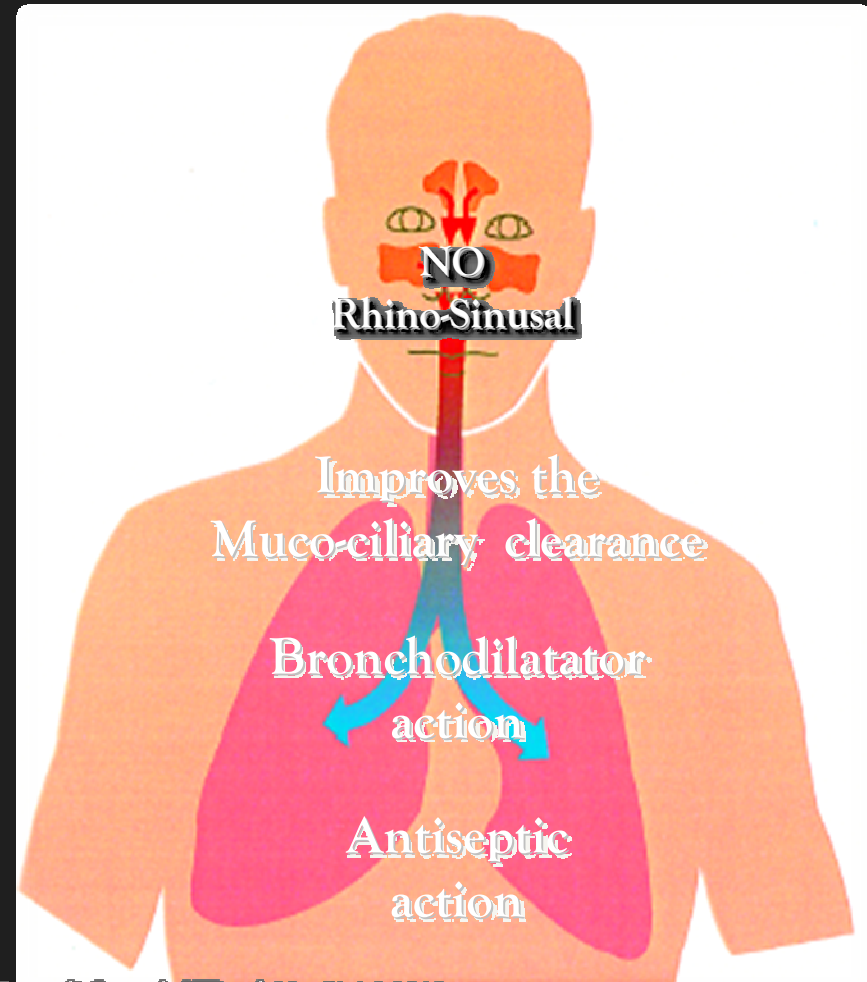
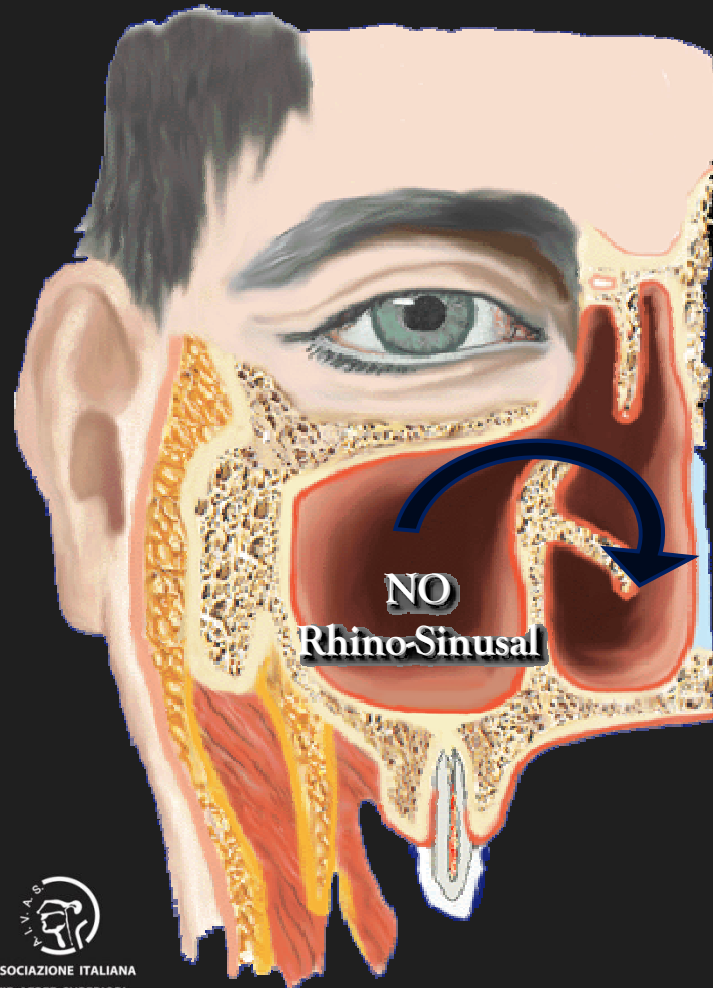
The Respiratory health

Depends on the correct *Nasal Respiration*

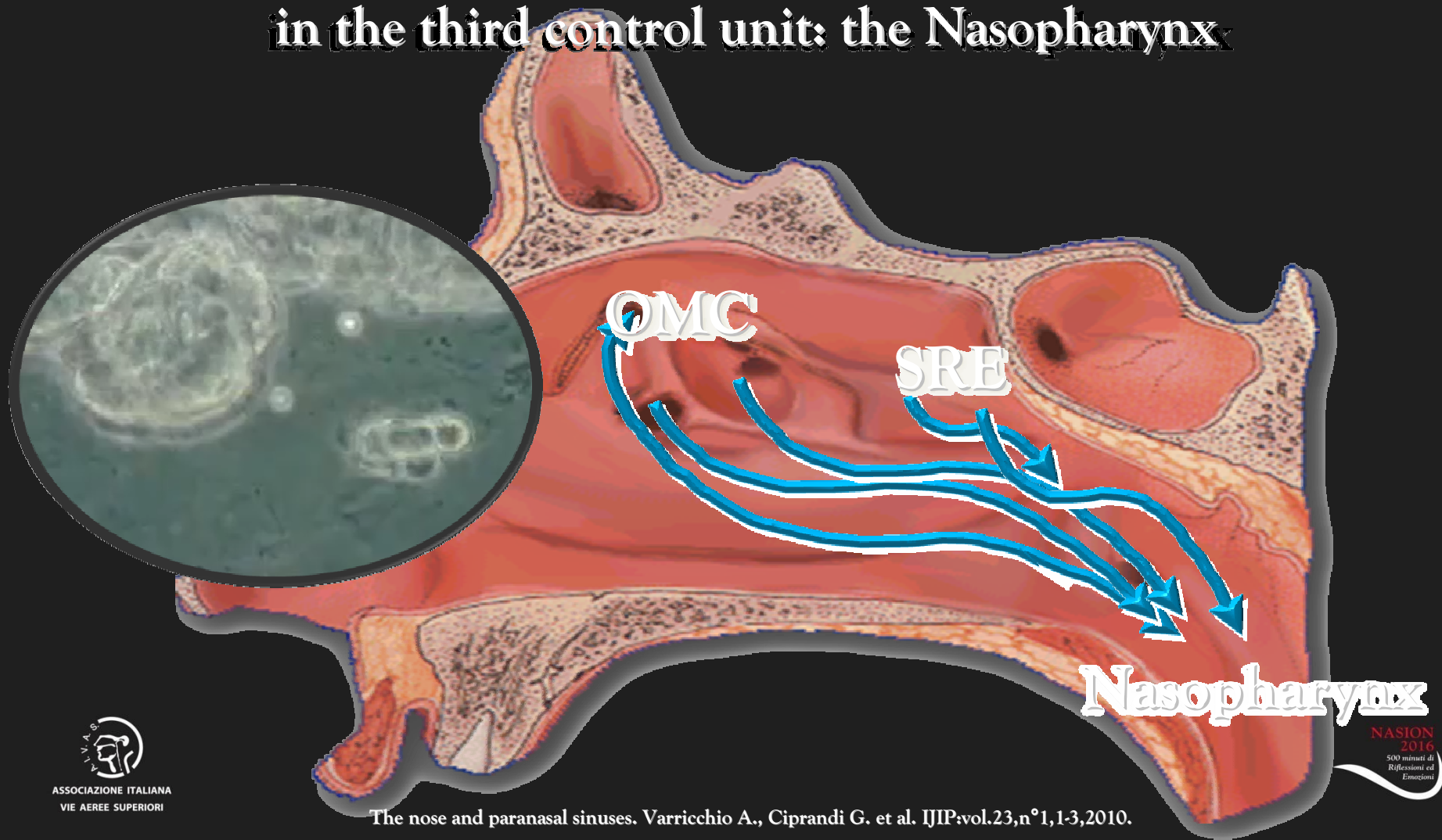
Home Message



Rhino-Sinusal NO



**The two control units OMC e SRE drain
in the third control unit: the Nasopharynx**



Nasopharynx: third control unit

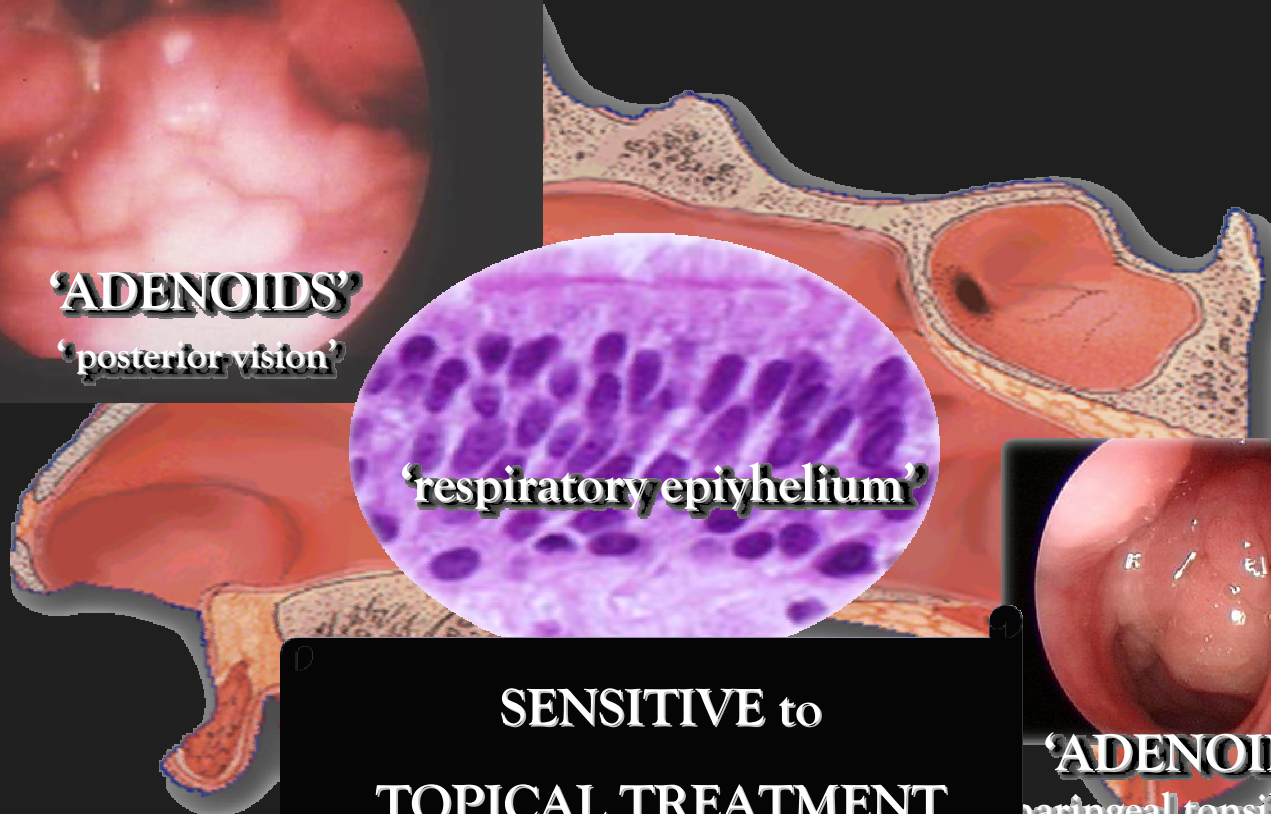
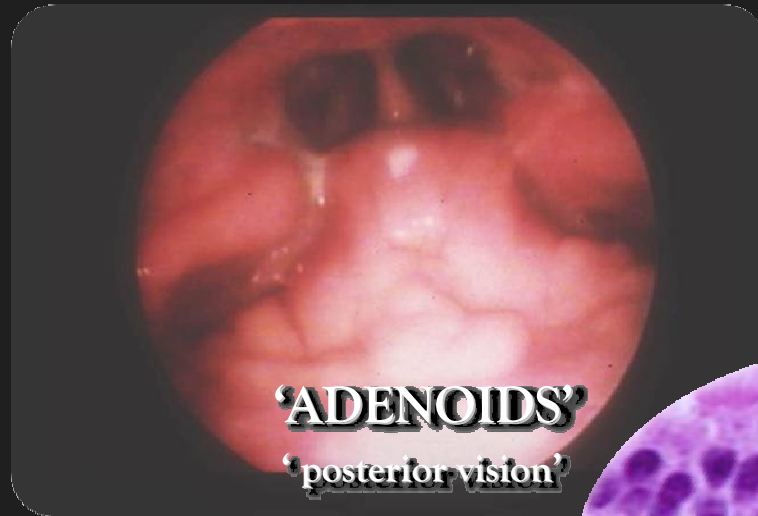


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The nose and paranasal sinuses. Varricchio A., Ciprandi G. et al. IJIP:vol.23,n°1,1-3,2010.

NASION
2016
500 minuti di
Riflessioni ed
Emozioni

Nasopharynx: home of 'Adenoids'



SENSITIVE to
TOPICAL TREATMENT



Nasopharynx: home of the 'Post-Nasal drip'

Home Message

Post-Nasal drip

Rhino-Otitis

Rhino-Bronchitis
'COUGH'



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The nose and paranasal sinuses. Varricchio A., Ciprandi G. et al. IJIP:vol.23,n°1,1-3,2010.

NASION
2016

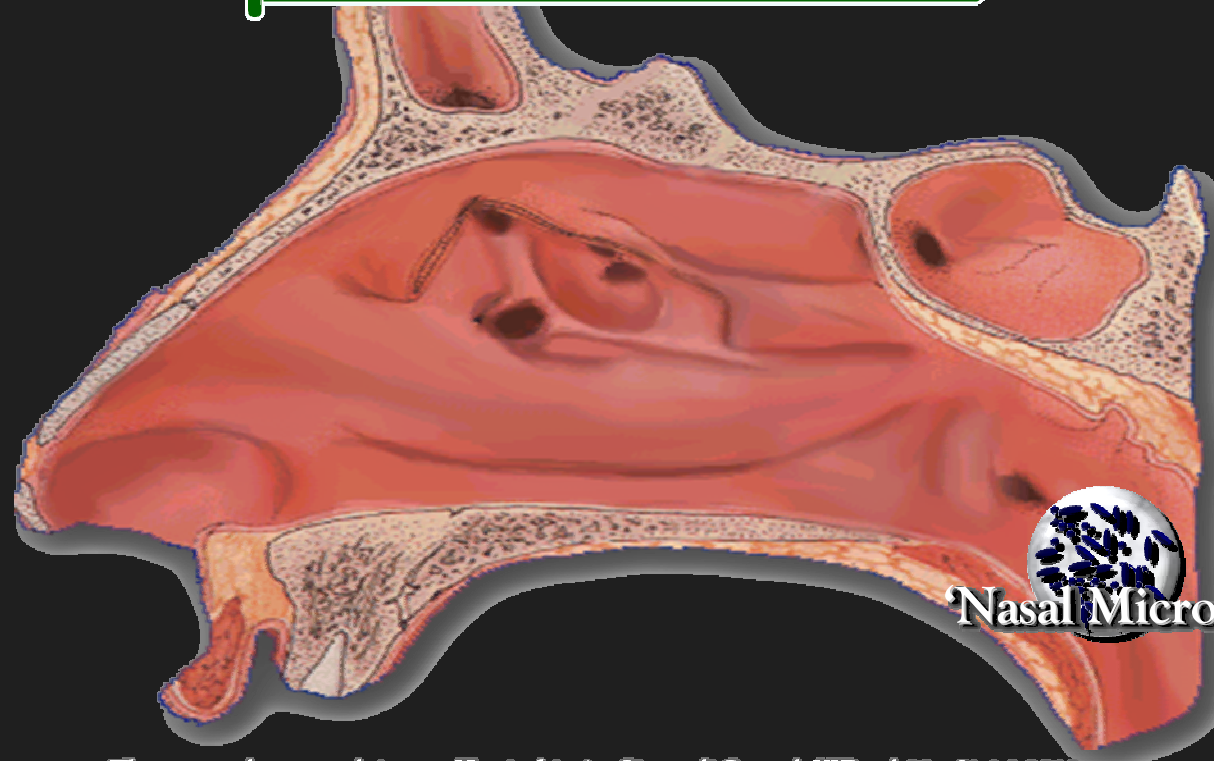
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Riflessioni ed
Emozioni

Post-Nasal Drip in the middle-inferior airways



Nasopharynx: home of the del *'Nasal Microbiota'*

Home Message

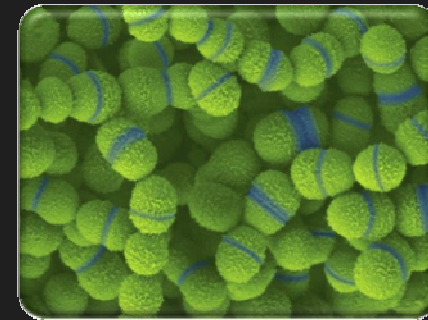


NASAL MICROBIOTA

The **Nasal Microbiota** (VAS) includes over **700 microorganisms** that:

1. occupy **specific niches**
2. **Compete** with other bacteria
 - *for nutrients*
 - *for space*

Maintaining the microbiological balance



HOME MESSAGE

the nasal microbiota
plays a key role
in the etiopatogenesis of the RRI.



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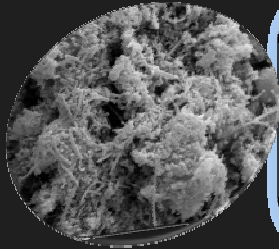
Why an infection becomes recurrent or chronic

?

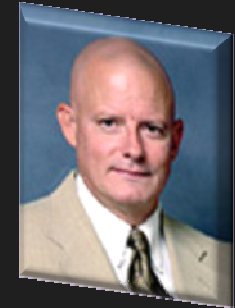


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BIOFILM



Literature Review

**Eradicating Chronic Ear, Nose, and Throat
Infections: A Systematically Conducted
Literature Review of Advances in Biofilm
Treatment**

Marzo 2011

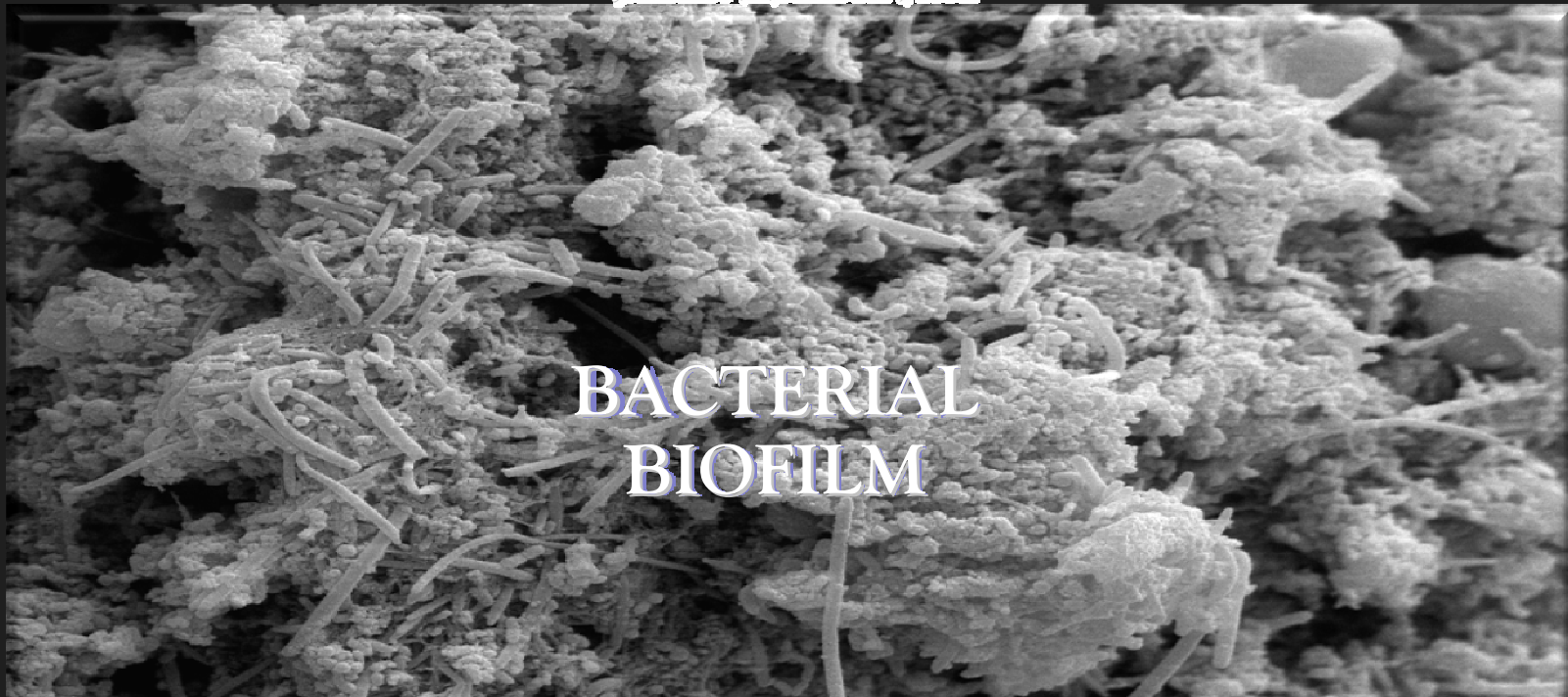
A systematic review by one of the ENT best school



Biofilms and Chronic Infections

Randall D. Wolcott, MD Garth D. Ehrlich, PhD

JAMA 299(22):2662-2664, 2008



BACTERIAL
BIOFILM

- ✓ Strategic mode of bacterial survival
- ✓ 1° cause of recurrent bacterial infections (80%)

National Institute of Health degli U.S.A, 1998



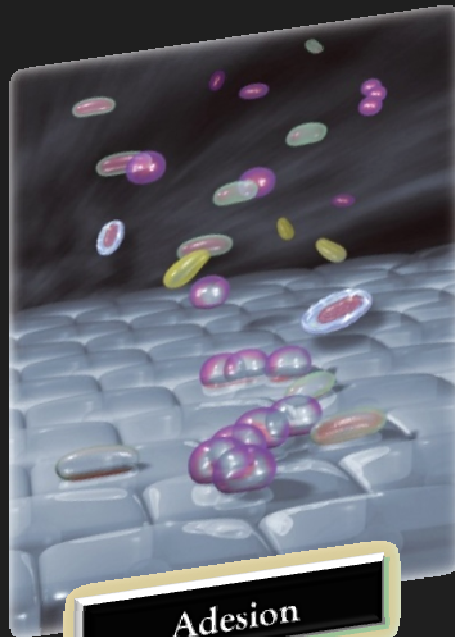
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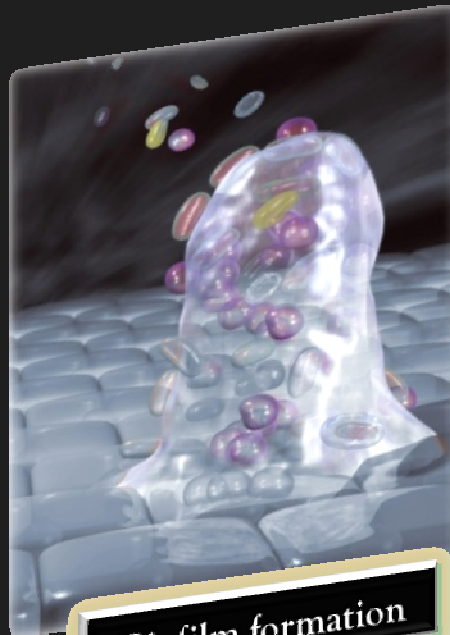
Biofilms and Chronic Infections

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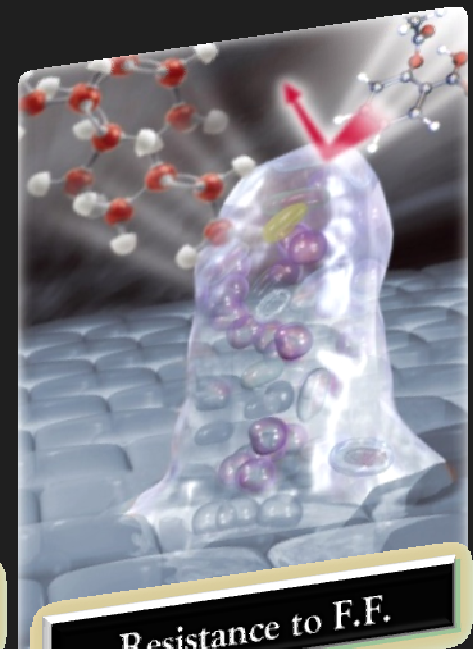
Adesion



Biofilm formation



Intermittent release

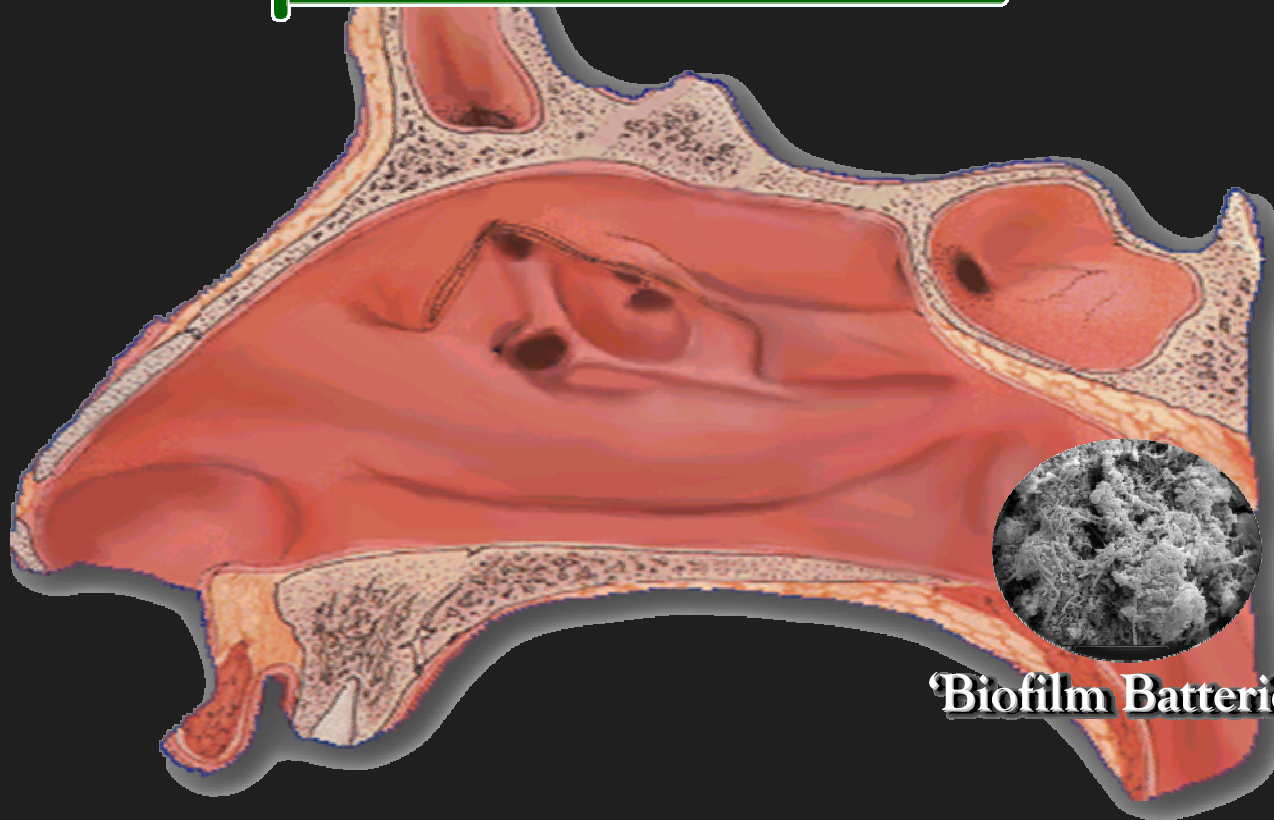


Resistance to F.F.

How does a bacterial biofilm form?

Nasopharynx: home of the '*Bacterial Biofilm*'

Home Message



'Biofilm Batterico'

INHALATORY CRENOTHERAPY

thermal water inhalations - PubMed - NCBI 26/09/14 11:19

PubMed

Display Settings: ☒ Summary, 20 per page, Sorted by Recently Added

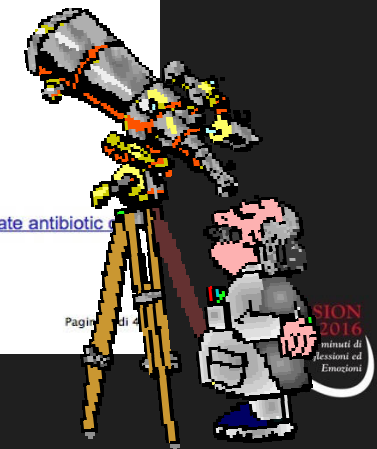
Showing results for **thermal water inhalations**. Search instead for [thermal water inhalation](#)

Results: 1 to 20 of 116

- ☐ [Thermal water applications in the treatment of upper respiratory tract diseases: a systematic review and meta-analysis.](#)
1. Keller S, König V, Mösges R.
J Allergy (Cairo). 2014;2014:943824. doi: 10.1155/2014/943824. Epub 2014 Jun 1. Review.
PMID: 24987423 [PubMed] [Free PMC Article](#)
- ☐ [Reducing agents decrease the oxidative burst and improve clinical outcomes in COPD patients: a randomised controlled trial on the effects of sulphurous thermal water inhalation.](#)
2. Contoli M, Gnesini G, Forini G, Marku B, Pauletti A, Padovani A, Casolari P, Taurino L, Ferraro A, Chicca M, Ciaccia A, Papi A, Pinamonti S.
ScientificWorldJournal. 2013 Dec 23;2013:927835. doi: 10.1155/2013/927835. eCollection 2013.
PMID: 24453924 [PubMed - indexed for MEDLINE] [Free PMC Article](#)
- ☐ [Salso-sulphide thermal water in the prevention of recurrent respiratory infections in children.](#)
3. Varricchio A, Giuliano M, Capasso M, Del Gaizo D, Ascione E, De Lucia A, Avvisati F, Capua G, Di Mauro F, Ciprandi G.
Int J Immunopathol Pharmacol. 2013 Oct-Dec;26(4):941-52.
PMID: 24355229 [PubMed - indexed for MEDLINE]
- ☐ [Toxin-induced respiratory distress.](#)
4. McKay CA Jr.
Emerg Med Clin North Am. 2014 Feb;32(1):127-47. doi: 10.1016/j.emc.2013.09.003. Review.
PMID: 24275172 [PubMed - indexed for MEDLINE]
- ☐ [Physicochemical characterization and aerosol dispersion performance of organic solution advanced spray-dried microparticulate/nanoparticulate antibiotic powders of tobramycin and azithromycin for pulmonary inhalation aerosol delivery.](#)
5. Li X, Vogt FG, Hayes D Jr, Mansour HM.

<http://www.ncbi.nlm.nih.gov/pubmed/?term=thermal+water+inhalationd+s>

WHAT'S NOW?



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VIE AEREE SUPERIORI



I.F.: 2.50

INTERNATIONAL JOURNAL OF IMMUNOPATHOLOGY AND PHARMACOLOGY

Vol. 26, no. 4, 941-952 (2013)

SALSO-SULPHIDE THERMAL WATER IN THE PREVENTION OF RECURRENT RESPIRATORY INFECTIONS IN CHILDREN

A. VARRICCHIO, M. GIULIANO, M. CAPASSO, D. DEL GAIZO, E. ASCIONE,
A. DE LUCIA, F. AVVISATI, F. CAPUANO, G. DE ROSA, F. DI MAURO and G. CIPRANDI

Associazione Italiana Vie Aeree Superiori (AIVAS) - Study Group on Thermal Water, Naples, Italy

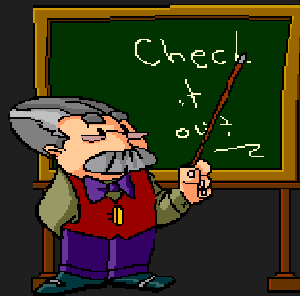
Received August 26, 2013 – Accepted October 28, 2013

THE PROJECT: THE PURPOSE



In particular, the study aims to demonstrate the important crenotherapeutic action in determining the disintegration of bacterial biofilm as well as to reduce the inflammatory cell charge on the nasal cytologic strip with reduction of the eosinophilic and neutrophilic carpet

INHALATORY CRENOTHERAPY



**Correct
diagnosis**



**Correct
method**



**Good
Thermal
water**



**GOOD
CARE**



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**NASION
2016**

500 minuti di
Riflessioni ed
Emozioni

THE PROJECT: STUDY PROGRAM

107 children (70 males, mean age $4.5 \pm 1,2$ years)



THE PROJECT: STUDY PROGRAM

107 children (70 males, mean age $4.5 \pm 1,2$ years)

**NaCl
Solutions
Inhalation +
nasal douche
12gg**

**Inhalation
Crenotherapy
Inhalations +
nasal douche
12gg**

Follow-up 3-6 mesi

THE PROJECT: CORRECT METHOD

INHALATION



Particles > 100 micron



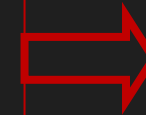
NOSE
PHARYNX
LARYNX
TRACHEA
BRONCHI



NASAL DOUCHE



Particles > 18 micron



NOSE
FARINGE

THE PROJECT: STUDY PROGRAM

Allegato A

IL BIOFILM BATTERICO E PARAMETRI CITOLOGICI NASALI IN BAMBINI CON INFEZIONI RESPIRATORIE RICORRENTI: EFFETTI DELLA CRENOTERAPIA

Score clinico-sintomatologico

Data compilazione ____/____/20____ Medico compilatore.....

A. Dati demografici

Cognome-Nome _____ Sesso M ☐ F ☐ Nato il _____ Codice paz. _____

B. Score clinico-sintomatologico

	Tempo 0 data.....	Tempo 1 data.....	Tempo 2 data.....
Ostruzione Nasale			
(0=assente; 1=lieve; 2=modesta; 3=intensa)			
Ipertrofia turbinati inferiori			
(0=1/3; 1=2/3; 2=3/3)			
Blocco COM			
(0=assente; 1=presente)			
Ipertrofia adenoidica			
(0=1/4; 1=2/4; 2=3/4)			
Rinorrea sierosa			
(0=assente; 1=lieve; 2=modesta; 3=abbondante)			
Spotting rinofaringeo			
(0=assente; 1=presente)			
Tosse			
(0=assente; 1=lieve; 2=modesta; 3=intensa)			

Score Totale _____

Data fine compilazione ____/____/____

Firma dello sperimentatore _____



GIORNO 1 (primo giorno di crenoterapia)

DATA ____/____/20____

Quali di questi sintomi ha avuto oggi Suo/a figlio/a:

- FEBBRE SI ☐ NO ☐
- NASO CHIUSO SI ☐ NO ☐
- NASO CHE COLA SI ☐ NO ☐
- MAL DI GOLA SI ☐ NO ☐
- MAL DI ORECCHIO SI ☐ NO ☐

Quanto ha sofferto oggi suo figlio/a per questi sintomi: (barrare la faccina corrispondente)

	NULLA	POCO	ABBASTANZA	MOLTO
Tosse?				
Difficoltà a respirare con il naso?				
Ha russato?				

Ha preso farmaci? SI ☐ NO ☐

Se la risposta è SI indichi il medicinale assunto: _____

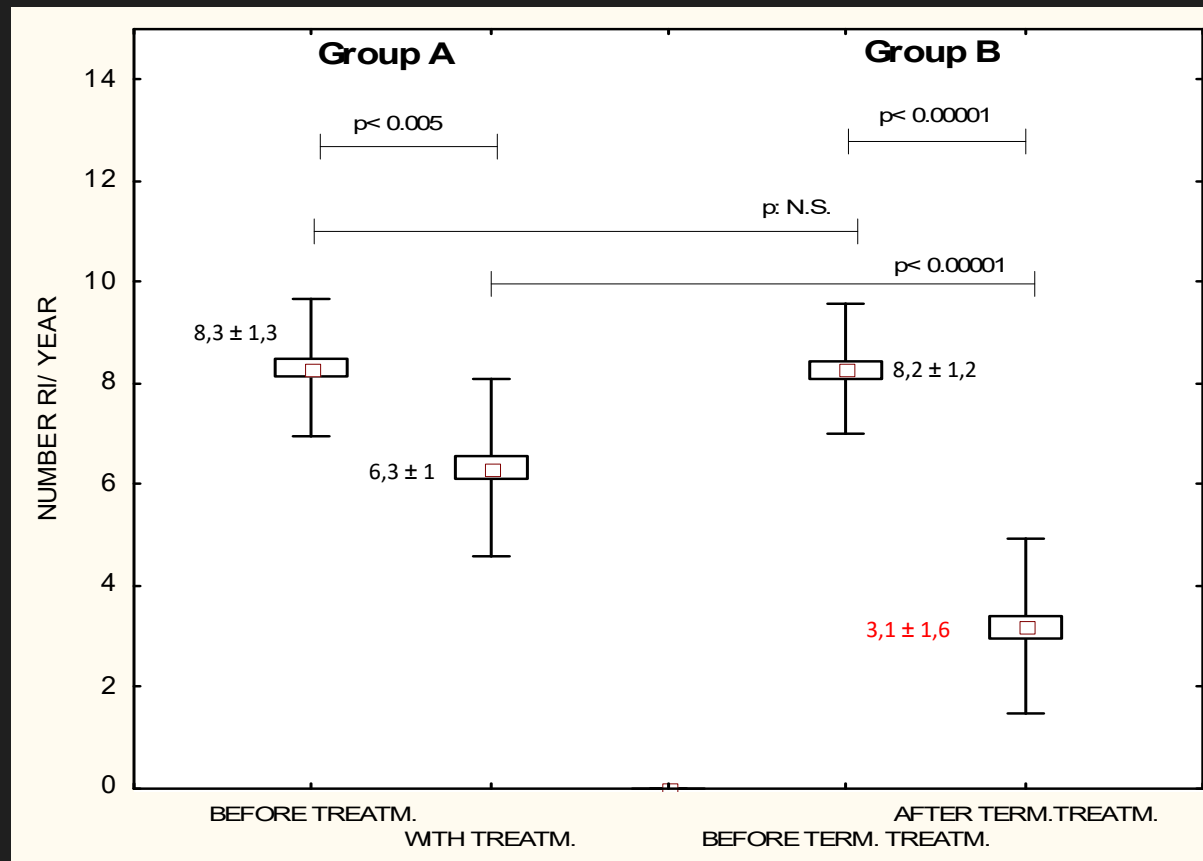
Ha preso il farmaco: MATTINA ☐ PRANZO ☐ SERA ☐



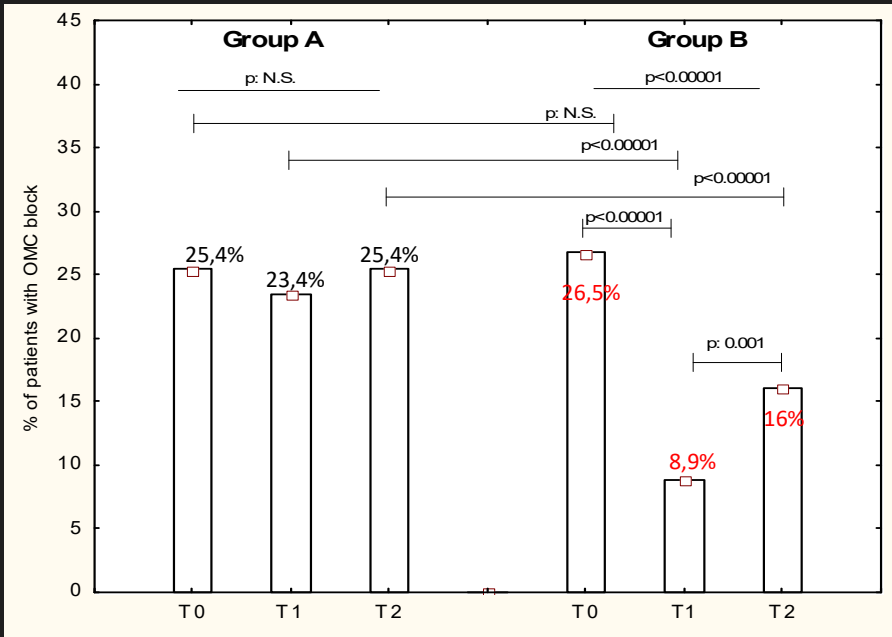
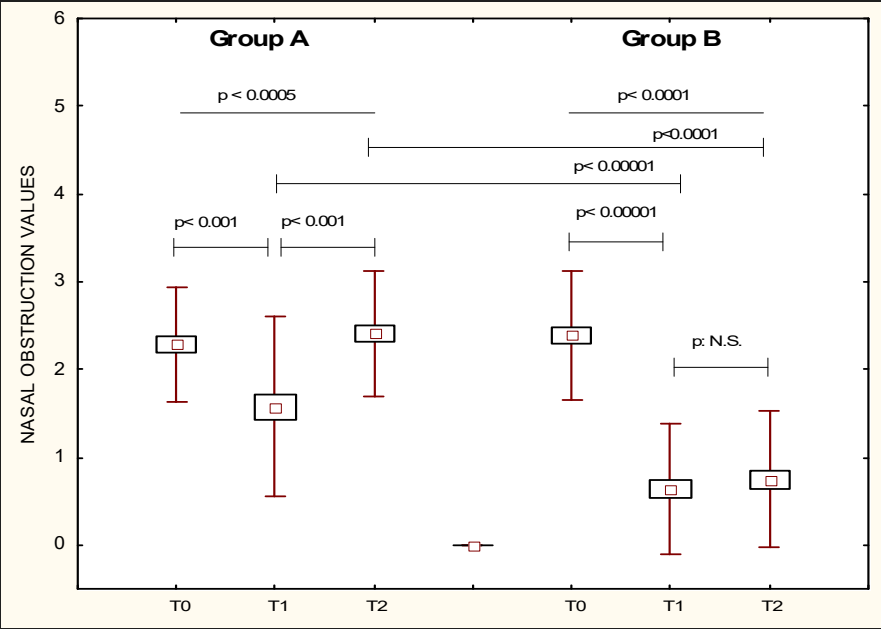
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NASION
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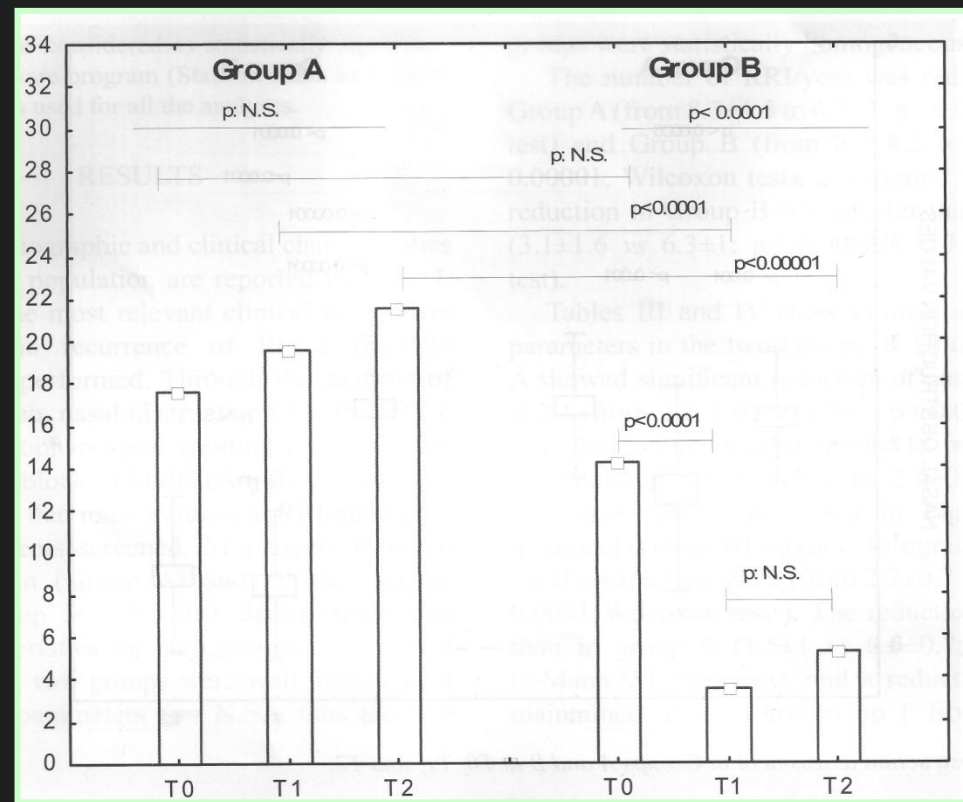
RESULTS: N° RRI/YEAR



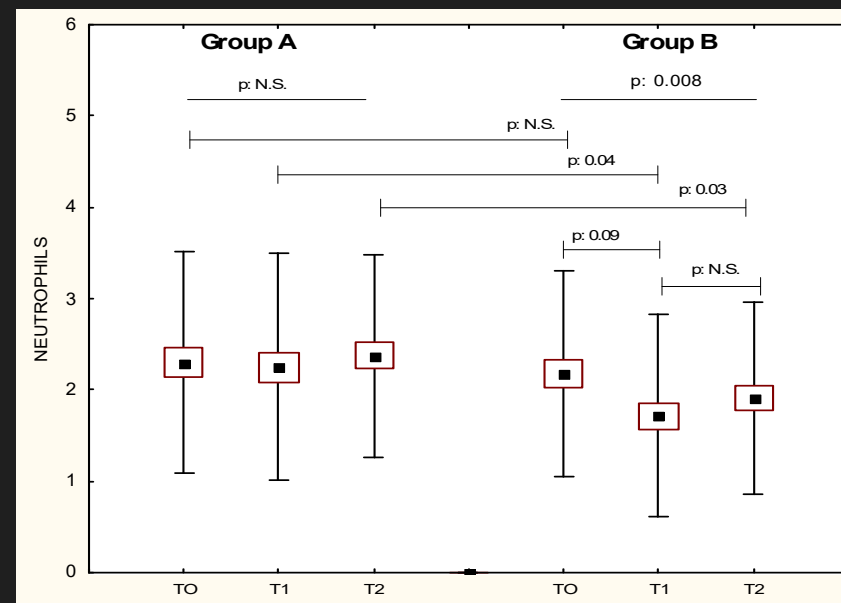
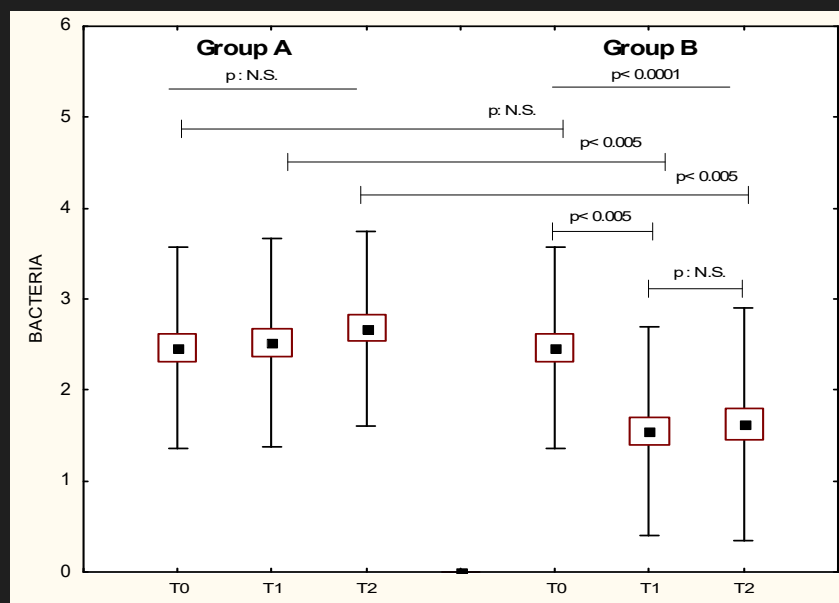
RESULTS: NASAL OBSTRUCTION - OMC BLOCK



RESULTS: ADENOID IPERTROPHY 3/4



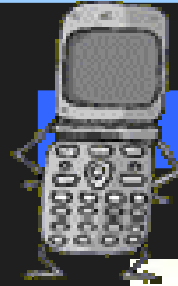
RESULTS: BACTERIAL AND NEUTROPHIL CHARGE



CONCLUSION

In conclusion, this single-blind study provided the first evidence that Agnano crenotherapy may be capable of preventing RRI as it exerts some positive effects, such as a reduction of nasal obstruction, turbinate and adenoid hypertrophy, ostiomeatal complex blockage, biofilm, neutrophil and bacteria count.

INHALATION CRENOTHERAPY



HOME MESSAGE

- ✓ *Rationalize
administrat*
- ✓ *integrate th*
- ✓ *determine
thermal trea*



d the method of

r surgical therapy

end of the