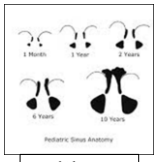
OMT in Sinusitis and Congestion



www.kids-ent.com

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Nova Southeastern University College of Osteopathic Medicine

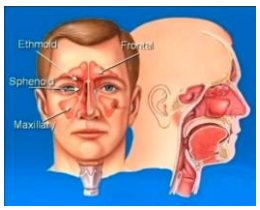
October 28, 2014

Objectives

At the end of the presentation the participant will be able to….

1. describe sinus and middle ear development, ventilation and lymphatic flow.
2. effectively apply OMM as indicated in the treatment of patients with sinus congestion.
3. describe parent and client education and modalities for self treatment as appropriate.

Anatomy and Function



- Bilateral air filled cavities
  - Frontal
  - Ethmoid
  - Maxillary
- Midline
  - Sphenoid
- Function mainly to protect the lungs
  - Filter the air
  - Regulate the temperature
  - Humidify the air
- 23,000 breaths per day means sinuses are working at all times

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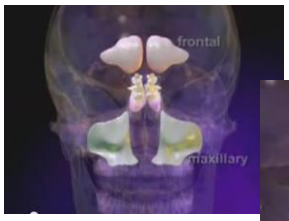
3D Anatomy of the 4 paired sinuses



Function:
Affects how your voice sounds

Function:
Lightens the Head

Video by Sunny Pawar
https://www.youtube.com/watch?v=8GRgxZstkoo

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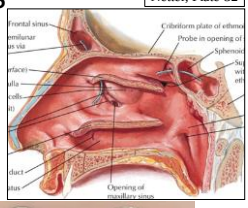
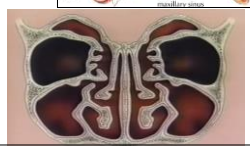
Drainage pathways

- Maxillary , frontal, anterior ethmoid sinuses drain into the middle turbinate
- Posterior ethmoid into the superior meatus
- Sphenoid sinus into the sphenoethmoid recess

Netter, Plate 32





https://www.youtube.com/watch?v=h6Vck7g71UE

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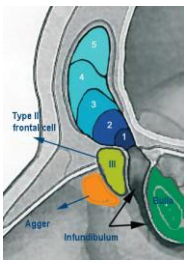
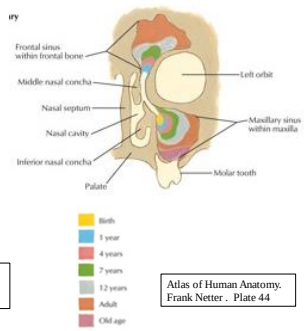
Age-related Growth of Sinuses



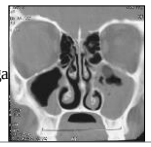
Embryology of nose and paranasal sinuses
By Dr. T. Balasubramanian M.S. D.L.O.
http://www.drtbalu.co.in/emb_nose.html



Atlas of Human Anatomy.
Frank Netter . Plate 44

Definitions and Pathology for sinusitis

- Acute Sinusitis
  - Inflammation of the paranasal sinuses
- Chronic Sinusitis
  - >8-12 weeks
  - Recurrent
- Causes
  - Anatomical issues – narrow ostia, polyps
  - Related illnesses – allergies, asthma
  - Infectious agents – bacterial, viral, funga



Ctmripathologyblog.blogspot.com

- Drainage of ostia is affected by:
  - anatomical obstruction
  - mucosal edema causing stagnation
  - Proptosis from left maxillary sinus impaction

https://www.youtube.com/watch?v=h6Vck7g71UE

Epidemiology & Therapy

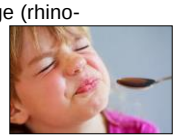
www.fitzsbrentwood.com

- Sinusitis affect 30-40 million people per year
- Cost > $5.8 billion per year
- Frequent antibiotic use
- 16 million office visits per year
- Associated with pain and discomfort
- Many parents seek adjunctive care for their children

- Current Therapies
  - Antibiotic use
  - Identify predisposing factors
    - Identify allergen triggers
    - Avoid exposure
  - Antihistamines
  - Topical nasal steroids
  - Decongestants
  - Saline nasal spray or Lavage
  - Immunotherapy
  - OMT

blog.copdfoundation.org

Antibiotics for persistent nasal discharge (rhino-sinusitis) in children….



www.sigalonhealth.soup.io

- Cochrane Review
  - 6 studies reviewed
  - 562 children
  - Antibiotics vs Placebo or standard therapy
  - 4 studies included x-ray evidence of sinusitis
  - 40% of radomized children did not have a clinical success at 2 to 6 weeks
- Conclusion
  - **Available evidence suggests antibiotics will reduce the probability of persistence in the short to medium-term.**
  - Benefits are modest
  - NNT: 8 children must be treated to achieve one additional cure
  - No long term benefits documented

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Nasal saline irrigation for symptoms of chronic rhino-sinusitis…THE NETTY POT

- Eight trials reviewed
  - 3 compared topical saline vs no treatment
  - 1 compared topical saline vs placebo treatment
  - 1 ts with intranasal steroids
  - 1 ts vs intranasal steroids
- Evidence exists for the following:
  - **Saline is effective as an adjunct treatment**
  - Saline is effective as a sole modality
  - Not superior to reflexology placebo
  - Not as effective as intranasal steroid
  - Improves objective measures
  - Unclear impact on symptoms

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First…do no harm?

- **ARCH INTERN MED/VOL 172 (NO. 19), OCT 22, 2012 WWW.ARCHINTERNMED.COM**
- Mounting evidence that the benefits of antibiotics is limited
  - 80% of patients diagnosed with acute sinusitis received antibiotic
  - 20% received first-line amoxicillin
  - 50% of those diagnosed received a macrolide or quinolone
  - Overuse of flouroquinolones is a risk factor for resistant respiratory tract infections

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So why use antibiotics?

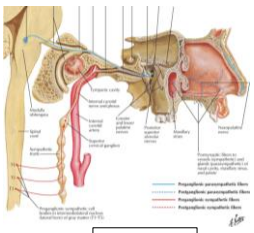
- Complications:
  - Paranasal sinuses in close proximity to brain and orbit: can have spread of infection
  - Intracranial complications
    - cavernous sinus thrombosis
    - meningitis
  - Orbital complications
    - preseptal cellulitis
    - orbital cellulitis

OMT Research

- **Mary Lee-Wong, MD, Division of Allergy and Immunology, Beth Israel Medical Center**
  - **J Allergy and Therapy 2011/2:2** http://dx.doi.org/10.4172/2155-6121.1000109
- 16 patients from their allergy clinic requesting alternative therapies for chronic sinus pain
  - 15 accepted OMT/1 patient declined
- Before and After OMT:
  - score card to assess the severity of their sinus pain
  - 5 techniques were performed for 3 minutes each (total 18 minutes of OMT)
- Direct Pressure and "Milking"
  - Frontal Sinus pressure and milking technique
  - Supra-orbital pressure technique
  - Maxillary sinus pressure technique
  - Direct pressure over the temporal areas
- Drainage or "Milking" technique
  - Nasal passages are milked
- 3 minutes each cycles
- 6 cycles were performed
- Total of 18 minutes of OMT

Eileen DiGiovanna, An Osteopathic Approach to Diagnosis and Treatment, 3rd ed.

- "Sinusitis is almost always in conjunction with somatic dysfunction of the upper cervical spine.
- Sympathetic innervation to the sinus areas arises from the upper thorax and travels through the cervical region.
- An occipito-atlantal (OA) somatic dysfunction is the most common.
- Treating the cervical somatic dysfunctions and performing sinus drainage techniques help to relieve pain as well as assist in drainage of the sinuses."

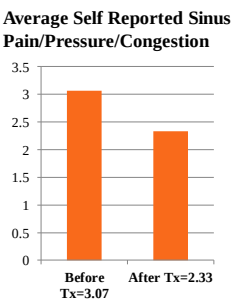


Netter: Plate 39

Results: 1) OMT reduces sinus pain

Average Self Reported Sinus Pain/Pressure/Congestion (N=15)		
	Mean (SD)	Mean Difference (95% CI)
Before	3.07 (0.88)	0.73 (0.34 to 1.12)
After	2.33 (0.72)	

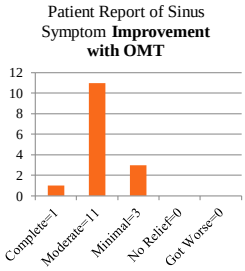
Paired t-test p=0.0012

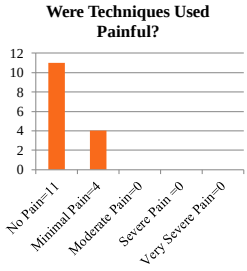


Results:

2) **OMT moderately improves symptoms**

3) **OMT was not painful**





Frontal sinuses

http://www.medindia.net/patients/patientinfo/maxillary-sinus-cancer.htm

Pressure:

- Physician seated at head of the supine patient
- Physician applies gentle pressure to the frontal sinuses with the thumbs
- Pressure is slowly increased and then released in a rhythmic motion
- Repeat several times

Milking:

- Physician places thumbs adjacent to each other in the middle of the forehead and with gentle sweeping pressure moves thumbs laterally toward the temples and then inferiorly towards the maxillary area

Repeat the cycle 6-8 times.

Supraorbital Notch

Pressure:

- Gentle pressure is applied over the supraorbital notch
- Repeat several times

Milking:

- Sweep thumbs along the eyebrow ridge bilaterally
- Repeat 6 cycles

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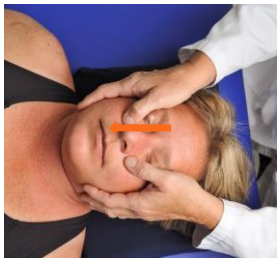
Maxillary Sinuses



Pressure:

- Apply pressure to the maxillary area with both thumbs
- Repeat several cycles

Milking:

- Massage the maxillary sinuses with the thumbs in a caudad direction starting at the top of the nose and pressing down the side of the nasal passages toward the maxilla
- Repeat 6 cycles

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Temporal areas

- Place your thenar eminences in the patient's temporal fossae (just lateral to the eyebrows), bilaterally
- Exert a gentle direct pressure over the temporal area both sides at the same time
- Apply pressure and release in a rhythmic fashion

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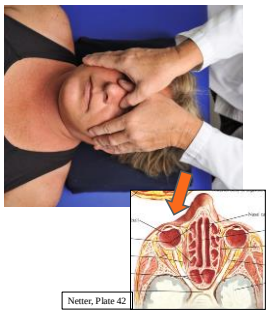
Nasal Bones



Pressure:

- Place the right thumb on the left side of the patient's nose (nasal bone) and the left thumb on the right side of the nose.
- Note that the thumbs are crossed above the patient's nasal bridge.
- Pressure is applied **alternately** by each thumb,
- Move down the length of the nose

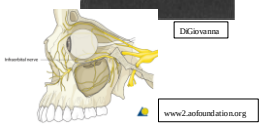
Milking:

- Uncross the thumbs:
  - right thumb on right side
  - left thumb on left side
- Create a sweeping motion bilaterally down the sides of the nose and out over the maxillae
- Repeat 6 cycles

End of study treatment intervention

- The above techniques were the only ones included in the study….
- But, DiGiovanna's chapter on sinus treatment also includes:
  - Counterstrain Techniques for:
    - Maxillary sinuses
    - Supraorbital nerves

Counterstrain Maxillary Sinuses



Maxillary Tenderpoints

- Located over the tender infraorbital nerves – V2
- Physician interlaces fingers above nasal bridge while thenar eminences rest on the zygoma
- Then applies pressure through the zygoma in a medial and anterior direction
- Confirm 70% improvement in tenderpoint pain
- Hold for 90 seconds.

Counterstrain Supraorbital Tenderpoints

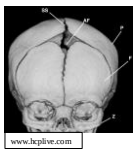
Supraorbital Tenderpoint:

- Located near site of supraorbital nerves
- Rest one arm on the patient's forehead, gently pulling it cephalad
- Fingers of the other hand gently squeeze the nasal bridge and apply traction caudally
- Confirm 70% improvement in pain
- Hold for 90 sec

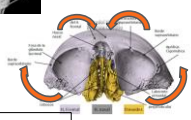
Additional Treatment Suggestions:

- Additional Suggestions:
  - Treatment of the larynx
  - Treatment of C3-C6 somatic dysfunctions (MET, HVLA, CS)
  - Hyoid lift
  - **Frontal lift**
  - Frontal Spread and Widen Ethmoid Notch
  - Cervical Lymphatic treatment
- Advanced Cranial Techniques:
  - **Opposing physiologic motion of the Vomer**
  - **Opposing physiologic motion of the Maxillae**
  - **"Face Lift"**

Frontal Bone motion



Glabella - posterior



Lateral angles - anterior

Ethmoid Notch - Widens

- Flexion of RTM
  - Glabella moves posterior and superior with crist galli (falx and sphenoid)
  - Metopic flattens
  - Ethmoid notch
    - Widens posteriorly and lowers
  - Lateral angles
    - Moves anteriorly
    - Frontozygomatic angle widens
  - Frontosphenoidal articulations
    - Moves with the sphenoid anteriorly and slightly inferolaterally
  - Coronal suture
    - Depressed at bregma
    - Moves anterolaterally at pterion

Frontal Lift during extension with narrowing of ethmoid notch

- Goal:
  - Move frontal bone into extension by narrowing the ethmoid notch and lift
- Hand Hold:
  - Interlace fingers above metopic suture
  - Hypothenar eminences on the lateral angles and the heels of the hands anterior to the lateral aspects of the coronal sutures
- Action:
  - Using the fingers as calipers
  - Compress lateral angles medially with gentle but insistent effort
  - Disengage (lift) the frontals from the parietals
  - Lift the frontal anteriorly or antero-inferiorly
  - Lift unilaterally or bilaterally to create a **balance** in the RTM system
  - Considerable pull
  - Maintain the balance and invoke assistance as needed (cough, laugh, cry)

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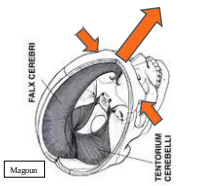

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Frontal Spread during flexion with widening of ethmoid notch

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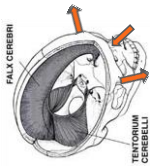
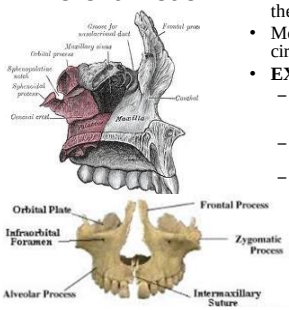


- **Goal:**
  - Move frontal bone into flexion/ER by widening the ethmoid notch and lift
- **Hand-hold:**
  - Interlock thumbs over metopic suture
  - Index fingers nestled under the zygomatic processes laterally
- **Action:**
  - Allow the RTM cycle to continue and
  - Simultaneously lightly depress the glabella posterosuperiorly to assist ER and the widening of the ethmoid notch
  - Move lateral angles anteriorly
  - Maintain position to point of balance
  - Assist with respiration or fluid direction from inion

Frontal Lift in a seated infant

Maxillary Bone Inherent Motion

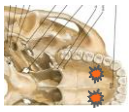


- Hangs from the frontal process from the frontal bone
- Is moved by the sphenoid through the palatines
- Mobilization effects antral circulation
- **EXTERNAL ROTATION:**
  - Frontal process:
    - posterior boarder turns laterally into a more coronal plane
  - Mid-incisal line:
    - recedes
  - Intermaxillary suture:
    - moves posteroinferiorly, lowering the horizontal plate, reducing its upward convexity and widening the alveolar arch

Alveolar process:
- inclines more laterally

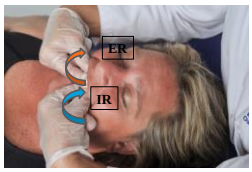
Zygomatic articulation:
- moves slightly anterosuperiorly at its lateral extremity

Maxillary Spread – opposing physiological motion

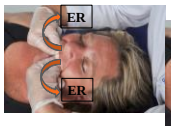


- Seated at the head of the table with elbows resting and gloved hands contacting each maxilla
- Thumb between maxilla and lip
- Index posterior to the incisive fossa
- Assess the motion present

Maxillary Spread – opposing physiological motion

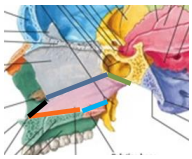


- Step I:
  - Monitor the motion of the maxillae
  - Indirectly ER one maxilla (**orange arrow**) while IR the opposite maxilla (**blue arrow**)
  - "Rock" these paired bones in opposite motions for 3 cycles
  - Rest



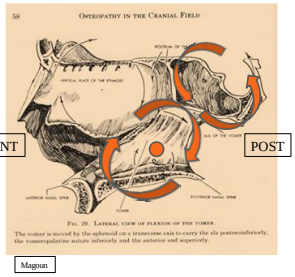
- Step II:
  - "Reset" the physiological motion by "rocking" them in the same RTM direction.
  - Both into ER then IR for 3 cycles
  - **SLOWLY**
  - Reassess RTM motion

Vomer – Anatomy



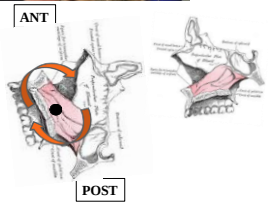
- Inferior portion of nasal septum
- Two fused plates separated at the superior border to form the alae and enclose a deep groove for the sphenoid articulation
- Vomer Articulations:
  - **Superior ala – sphenoid body**
  - Inferior border
    - **Post ¼ with palantines**
    - **Ant ¾ intermaxillary suture**
  - Superior border
    - **Top portion with ethmoid perpendicular plate**
    - **Bottom portion with the septal cartilage**

Vomer – Inherent motion



- Flexion Phase
  - Sphenoid base superior
  - Sphenoid body inferior
- Vomer
  - Posterior portion moves inferiorly
  - Anterior portion moves superiorly
  - Fulcrum is in middle of bone
  - Axis is transverse

Vomer Inherent Motioin

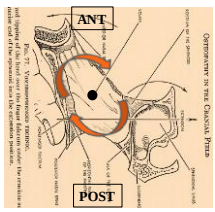


- Cephelad hand contacting greater wings of sphenoid
- Gloved - Intra-oral finger along inter-maxillary line

Note:

- Arched palate = Extended
- Flat palate = Flexed

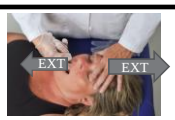
Vomer Motion Test



- Motion Test:
  - Drive sphenoid into flexion and monitor vomer for motion
  - Reverse and drive into extension
- Flexion
  - Posteriorly moves inferiorly; Feels like a pressure
  - Anterior moves superiorly or away from your finger
- Extension
  - Posteriorly moves superiorly and anteriorly
  - Anteriorly moves inferior or down into your finger
- **Compressed vomer** =
  - Accompanies a high palate
  - Feels rigid midline
  - No fullness felt along posterior inferior margin during cranial flexion

Vomer – Decompression Technique using opposing physiologic motion

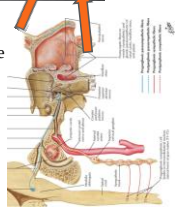
- Step I - A:
  - While moving the sphenoid into flexion
  - move the vomer into extension (press up on posteroinferior vomer)
- Step I - B:
  - While moving the sphenoid into extension, move the vomer into flexion (difficult-like trying to pull around a corner and lifting up anterior vomer)
- Repeat this cycle x 3; Pause



- Step II
  - Now move both bones 3 times in the same phase (flexion then extension phase)
- Rest
- Reassess

Face-Lift:

- Cephalad hand on lateral angles of frontal bone
- Lift anterior and superiorly
- Caudad hand with thumb on proximal nasal bone and middle finger on maxillary midline
- Action Lift:
  - Lift anteriorly and inferior to decompress:
    - Nasal bones
    - Maxillary bones
    - Ethmoid
- Await the even release or lift
- Reasses reciprocal tension motion



Thank you

References and photos:

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