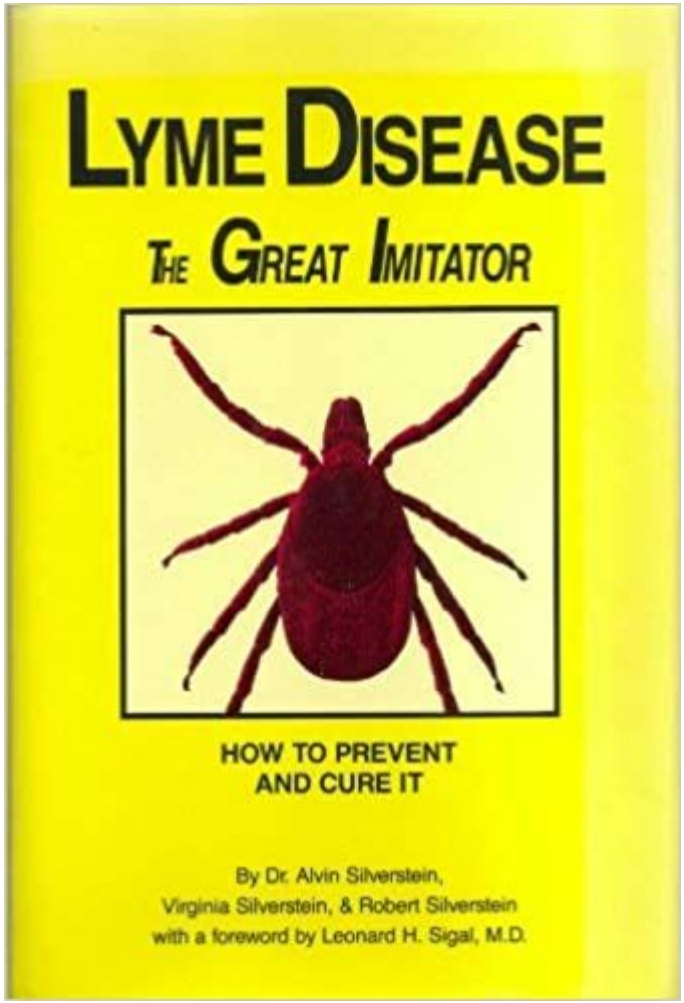
Assessment & Management of Obstructive Sleep Apnea in Psychiatry

Jason Patel, MD
Child & Adolescent Psychiatry



Disclosure Statement:

- I have no relationship with any industry or person(s) that could be construed as a conflict of interest in presenting this material

- No off label therapies or products will be discussed in this presentation.

Where we left off…

1. Obstructive sleep apnea commonly presents as psychiatric symptoms.
2. OSA is a reversible cause of psychiatric symptoms.
3. Non-obese, female, young, & patients w neurodevelopmental disorders are all cohorts at risk of OSA.
4. ADHD, depression, anxiety, fatigue, intellectual disabilities, mental illness are all reasons to refer for sleep studies. And insurance companies (including HMSA) acknowledge this.
5. Refer early (on intake appt if sx evident)

Psych sx = Brain sx = breathing problems (in many cases)

My objectives today, are to demonstrate:

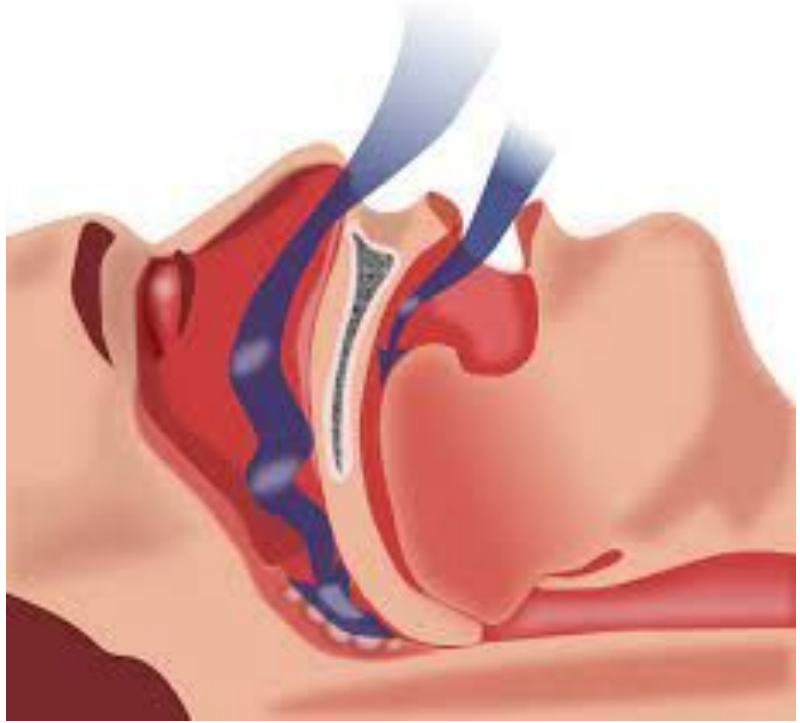
1. Looking for signs & symptoms, not gender or BMI, to screen for OSA.
2. Sleep studies should be a regular part of psychiatric practice.
3. Management requires a regular follow-up and multidisciplinary approach.

Defining Obstructive Sleep Apnea (OSA)

a face that doesn’t breathe well

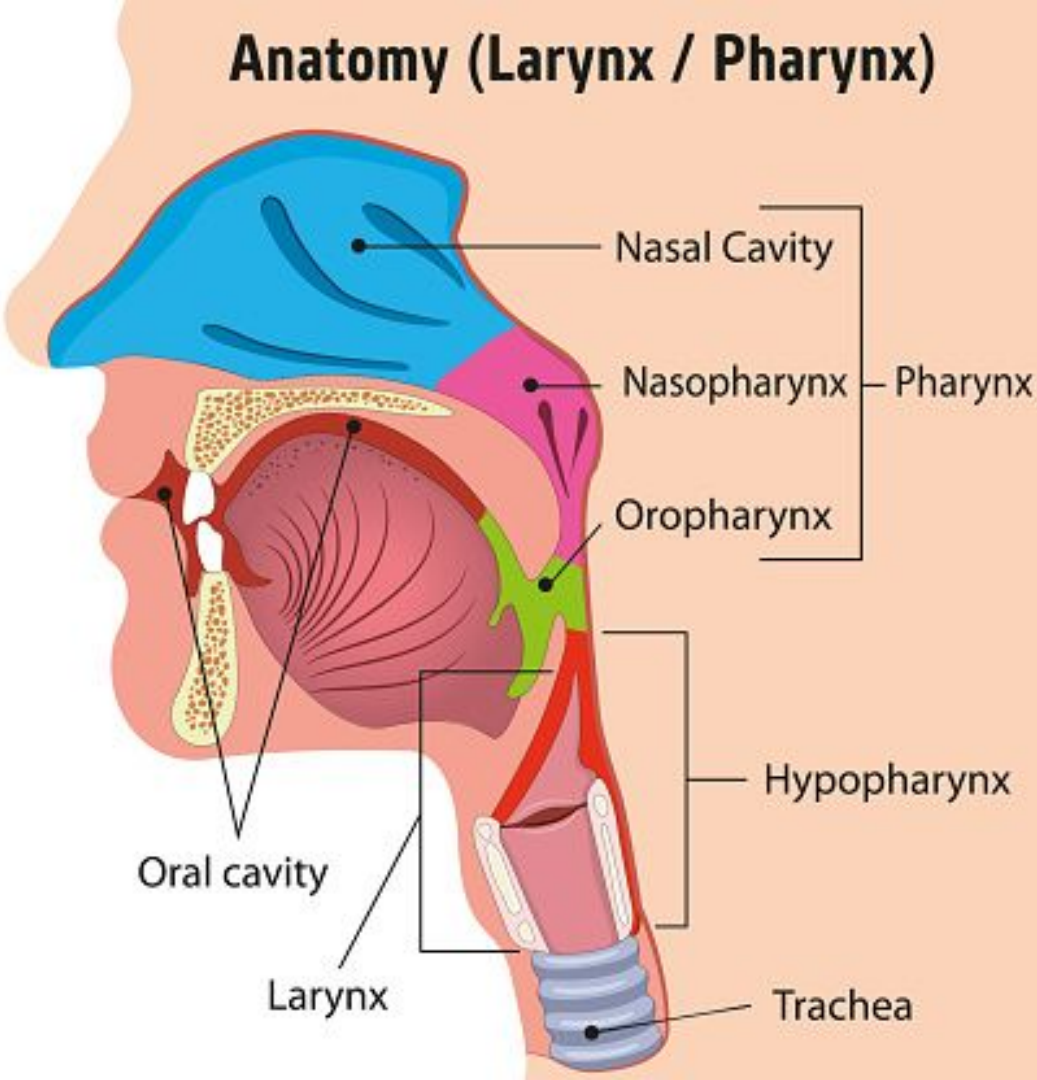
OSA refers to the obstruction of the upper airway during sleep causing an arousal, without awareness to the person.

This repetitive cycle of sleep fragmentation interrupts the brain and body’s recovery processes.

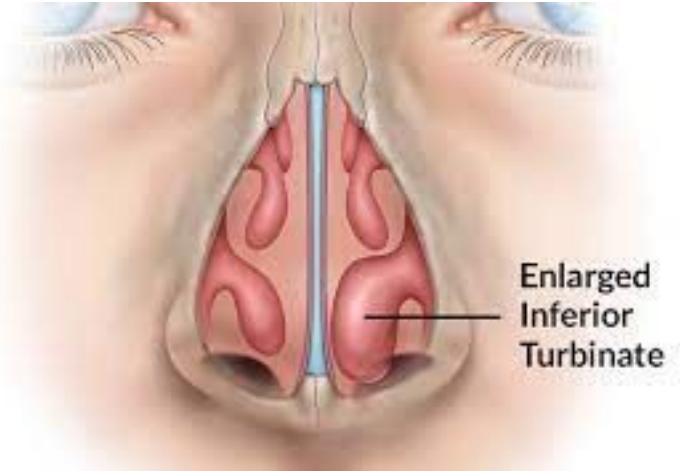


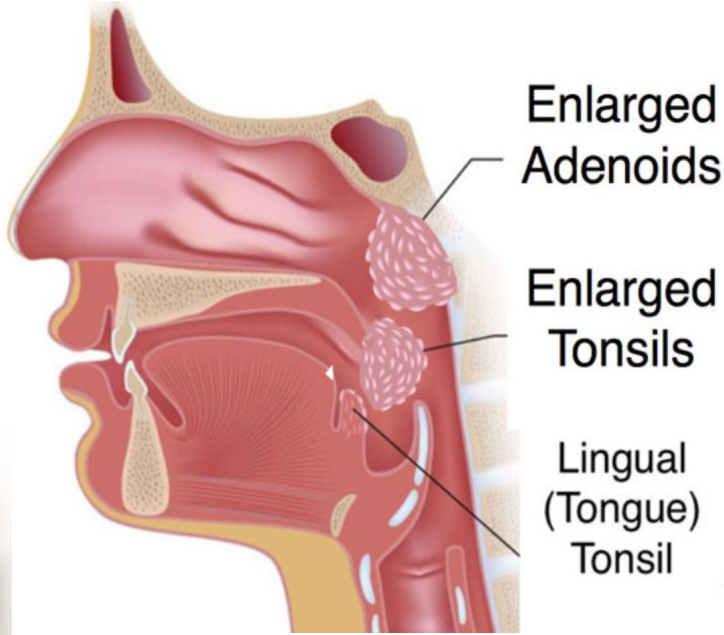
Locations

Obstructions can occur at the nares, nasal passage, nasopharynx, oral cavity, or, oropharynx. Either a blockage or collapse of the airway due to compromise of the airway wall.

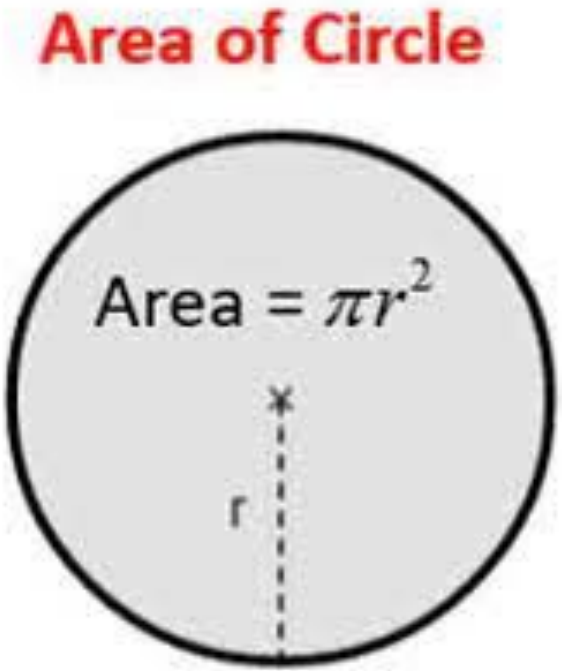


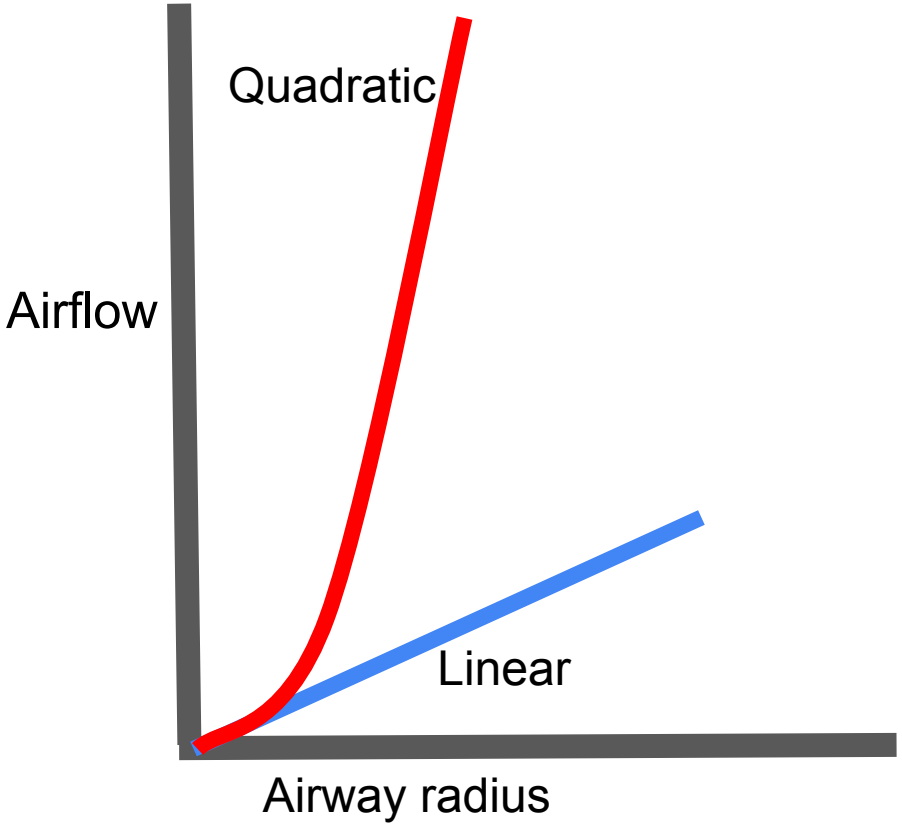
Possible causes of obstructions





Small change in airway = big impact





Nose is for Breathing, Mouth is for Chewing

The nasal passage warms, humidifies, filters, and provides antimicrobial treatment (nitric oxide).

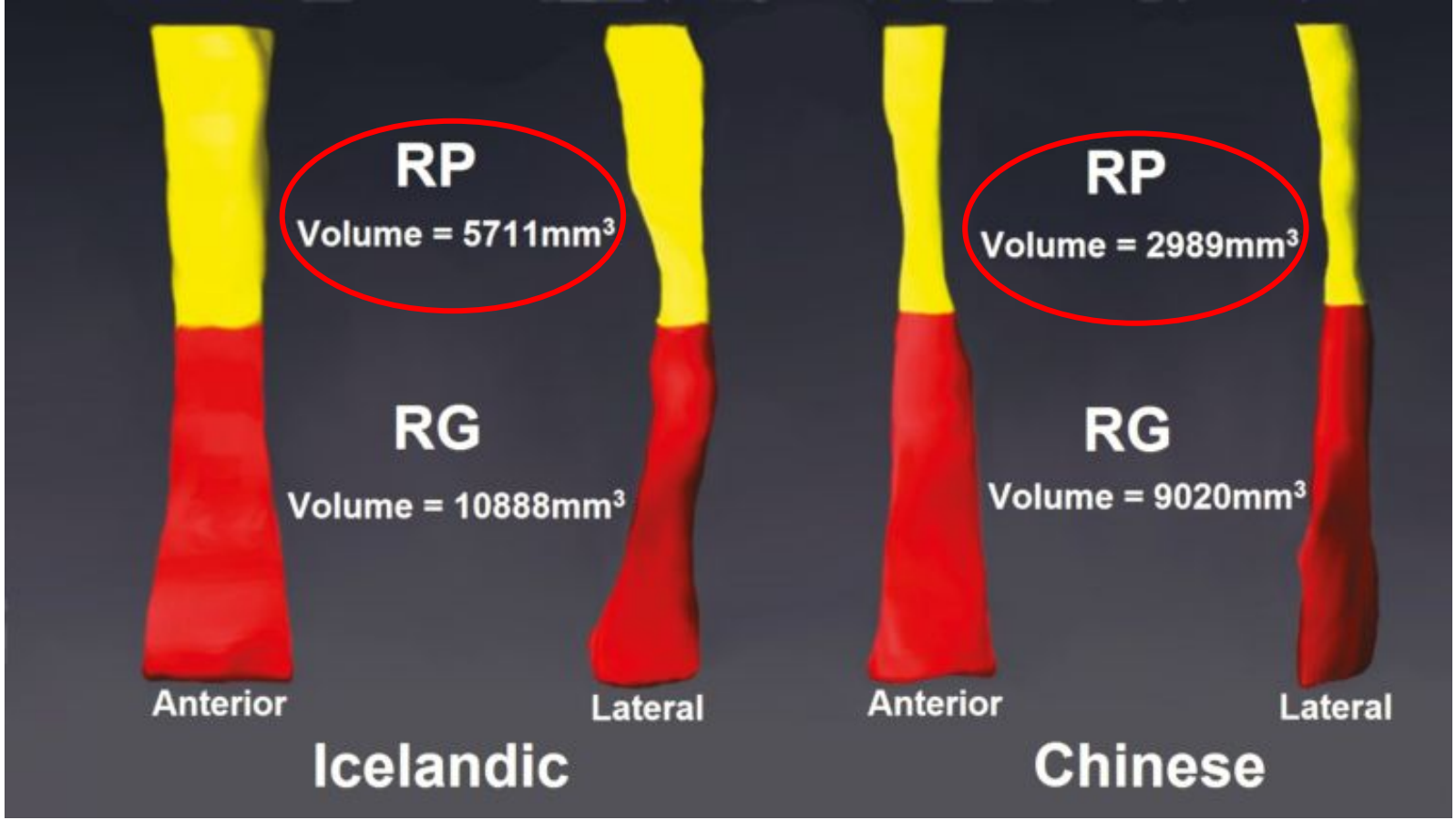
Closure of the mouth and correct tongue placement develops the lower face and size of the nasal passage - creating a face & airway that breathes optimally.

Assessment

looking for the breathing problem

Think beyond the elderly obese male

Think “whose airway is compromised?”



3D reconstruction of the upper airway separated into retropalatal (RP, yellow) and retroglossal (RG, red) regions in representative age, gender, and oxygen desaturation index matched Icelandic and Chinese patients.
→Icelandic patient (left), was a 63.5 years-old male with a BMI of 33.0 kg/m2 and ODI of 59.4 events/h.
→Chinese patient (right), was a 65.0 years-old male with BMI of 25.5 kg/m2 and ODI of 57.9 events/h.

History Taking

inquiring about a face that doesn’t breathe well

ROS

- Not refreshed upon waking up
- Sleeps in
- Tired in class or when bored
- Napping
- Awakenings
- Restless
- Drooling
- Nocturia
- Enuresis
- Dry mouth or needs water
- Headaches or jaw aches or bruxism
- Nasal congestion or halitosis
- Sleep walking, sleep talking, limb movements
- Psychiatric symptoms: Depression, anxiety, fatigue or inattention
- Behavioral issues - acting out, school avoidance, and irritability
- Treatment refractory psychiatric symptoms
- Asian ancestry
- Family history for sleep: OSA, snoring, sleep disorders

Adult OSA Screening Questionnaire - none are great

STOP-BANG is Most sensitive w older obese males. Likely to underdetected females, non-obese (craniofacial obstructions), & younger folks

Use the questionnaires to instruct you what to review, but avoid using their scoring system as they are not proven in our demographic population.

STOP
Do you often SNORE loudly (louder than talking)
Do you often feel TIRED, fatigued or sleepy during day
Has anyone OBSERVED you stop breathing during sleep
Do you have high blood PRESSURE
BANG
BMI more than 35Kg/m2
AGE over 50 years
NECK circumference > 40cm
GENDER Male

Pediatric Sleep Questionnaire

-sensitivity 78% becareful, it misses 20% kids!

-specificity at 72% - most often it is a sleep related breathing disorder!

While sleeping does your child…
Snore more than half the time?
Always snore?
Snore loudly?
Have “heavy” or loud breathing?
Have trouble breathing or struggle to breathe?
Have you ever…
Seen your child stop breathing during the night?
Does your child….
Tend to breathe through the mouth during the day?
Have a dry mouth on waking up in the morning?
Occasionally wet the bed?
Wake up feeling un-refreshed in the morning?
Have a problem with sleepiness during the day?
Has a teacher or other supervisor commented that your child appears sleepy during the day?
Is it hard to wake your child up in the morning?
Does your child wake up with headaches in the morning?
Did your child stop growing at a normal rate at any time since birth?
Is your child overweight?
This child often…
Does not seem to listen when spoken to directly
Has difficulty organizing tasks
Is easily distracted by extraneous stimuli
Fidgets with hands or feet or squirms in seat
Is “on the go” or often acts as if “driven by a motor”
Interrupts or intrudes on others (e.g. butts into conversations or games)

Chervin, R.D.; Hedger, K.; Dillon, J.E.; Pituch, K.J. Pediatric sleep questionnaire (PSQ): Validity and reliability of scales for sleep-disordered breathing, snoring, sleepiness, and behavioral problems. Sleep Med. 2000, 1, 21–32.

Examination

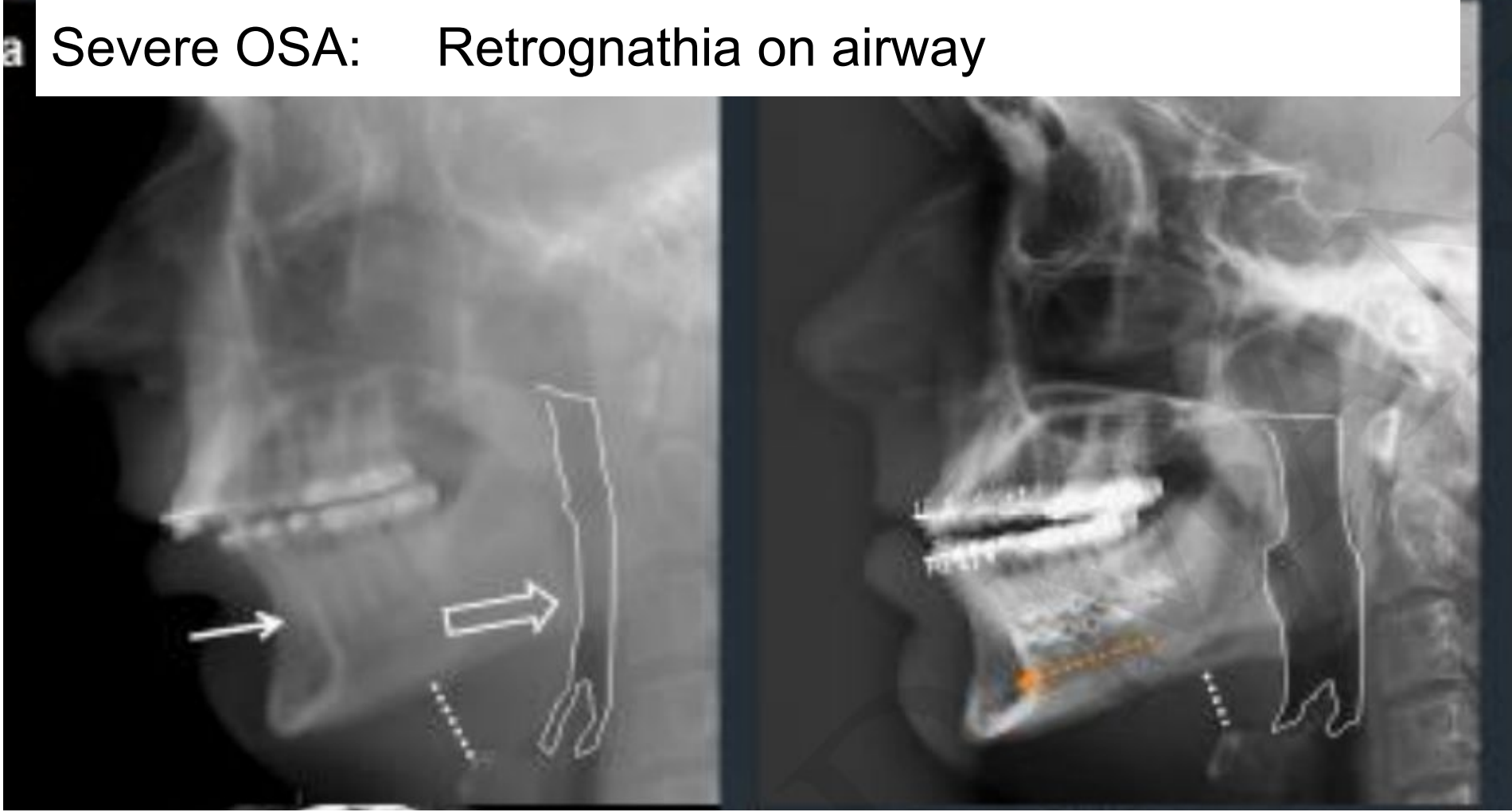
looking for a face that doesn’t breathe well

The face informs about the airway

- **Eyes:** sleepy or calm, not alert (when not addressed)
- **Periorbital**: bags/shiners under eyes
- **Lips**: mouth breathing
- **Nose**: difficulty breathing through each nostril
- **Cheeks:** squared (bruxism)
- **Side profile:** flat face; small or retracted jaw
- **Teeth**: teeth crooked, bite not aligned, worn
- **Tongue:** tied, scalloping, sticks out of mouth
- **Oral Cavity:** narrow - size defined by Mallapati Class
- **Tonsils:** past the pillars
- **Hard palate:** vaulted


FACIAL SCULPTING
Before
After

Severe OSA: Retrognathia on airway



Whytec Andy, Gibson Daren.IMAGING OF ADULT OBSTRUCTIVE SLEEP APNOEA.European Journal of Radiology https://doi.org/10.1016/j.ejrad.2018.03.010


Bruxism/Teeth Grinding Treatment
botonics
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Bruxism/Teeth GrindingTreatment
After 6 Months and 2 Treatments
botonics
botonics Specialist: Naruschka Henriques RN, INP
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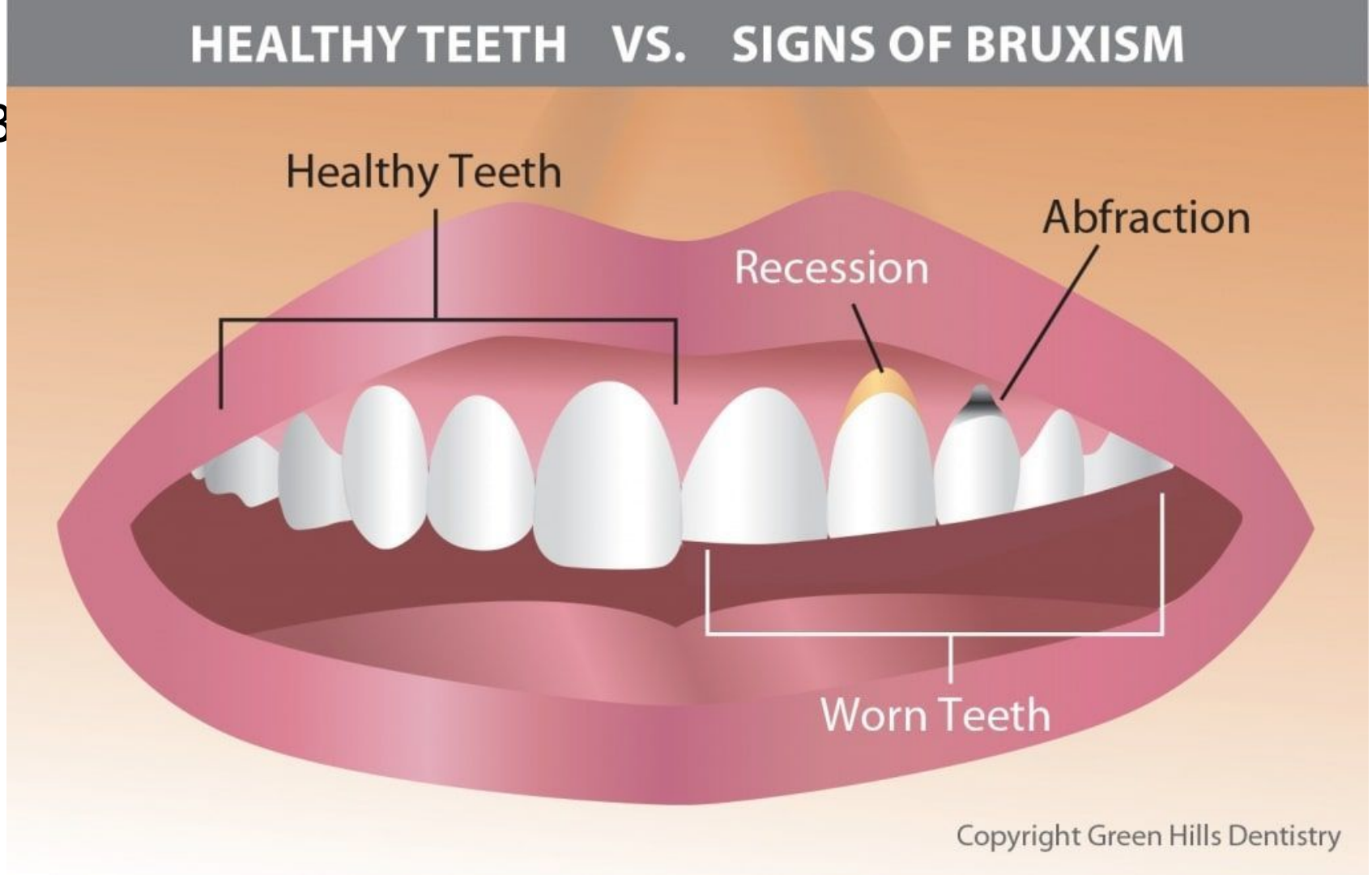
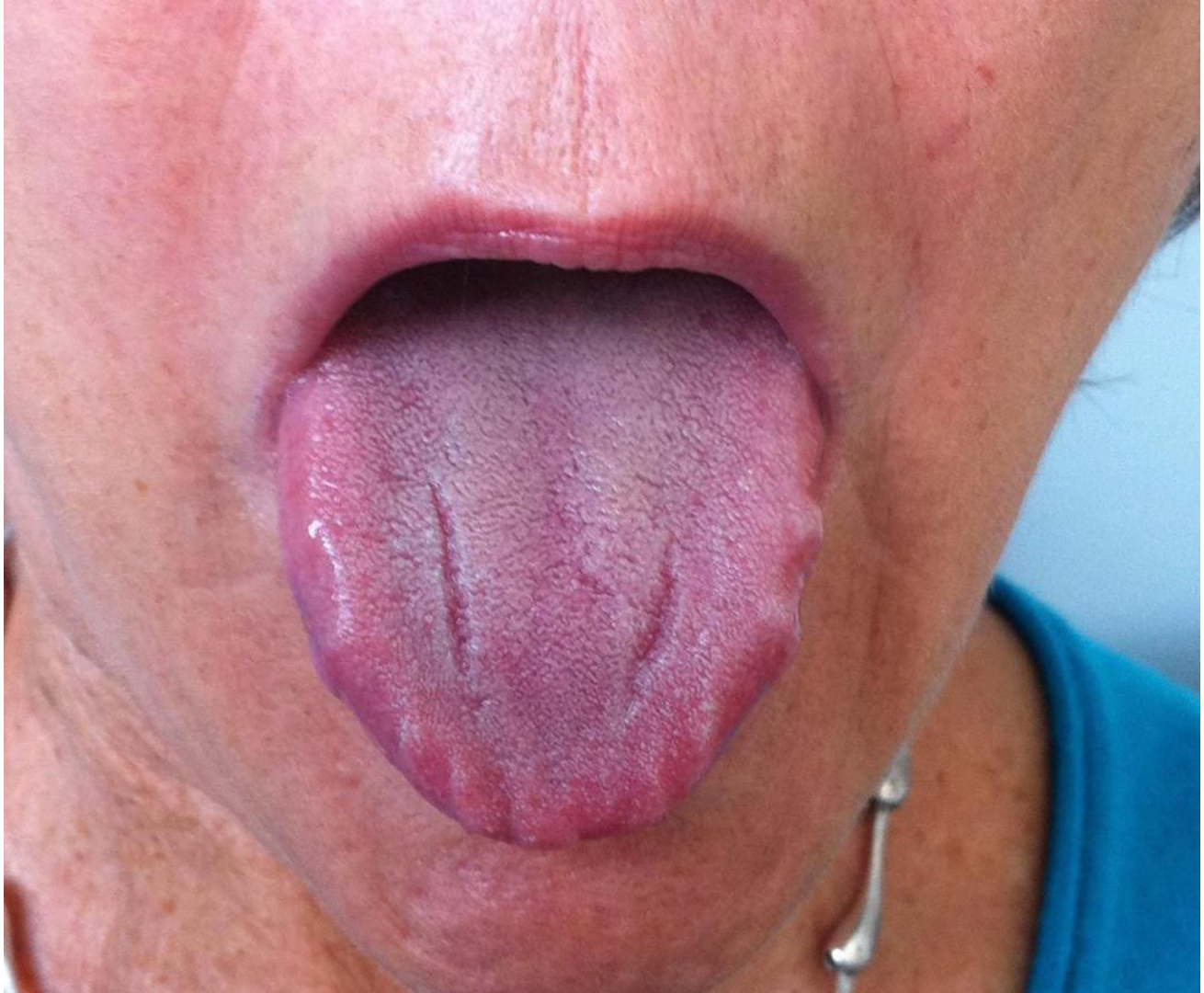

HEALTHY TEETH VS. SIGNS OF BRUXISM
Healthy Teeth
Recession
Abfraction
Worn Teeth
Copyright Green Hills Dentistry



Malocclusions (Crooked Bite)

Kids: 139 w OSA & 137 controls

prevalence of malocclusions in children with OSA was 89.9% compared to 60.6% in the control group ($P < 0.001$).

Factors independently associated with OSA:

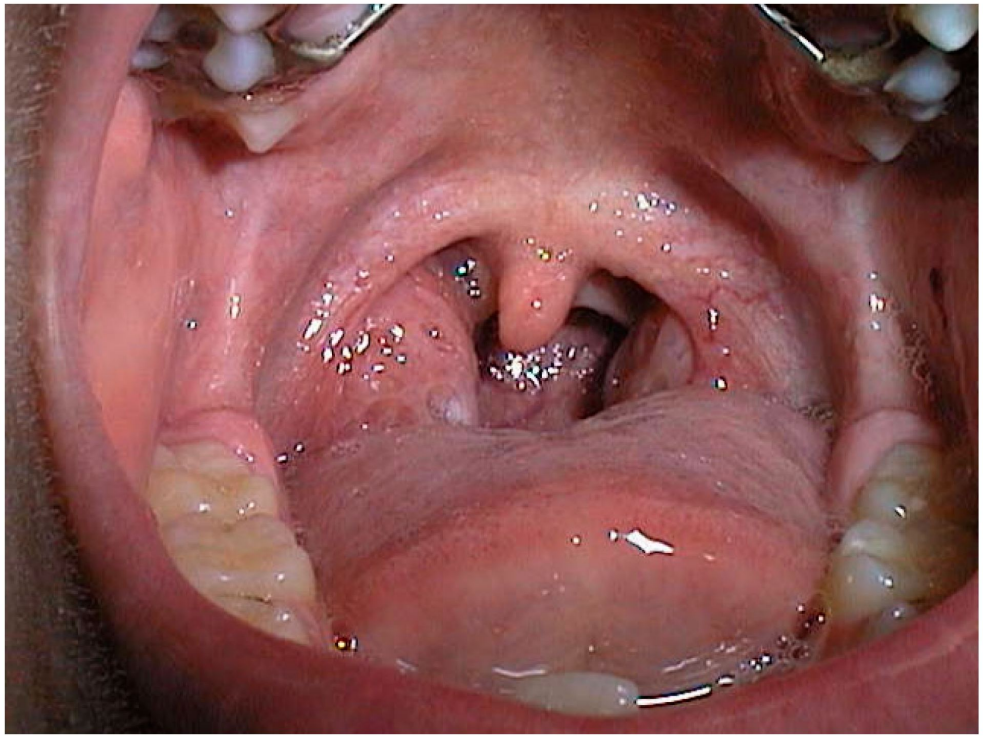
posterior crossbite (OR = 3.38; 95%CI:1.73-6.58)

reduced overbite (OR = 2.43; 95%CI:1.15-5.15.)

increased overbite (OR = 2.19; 95%CI:1.12-4.28)

increased overjet (OR = 4.25; 95%CI:1.90-9.48).


Hard palate
Soft palate
Uvula
Pillar
Class I
Class II
Class III
Class IV



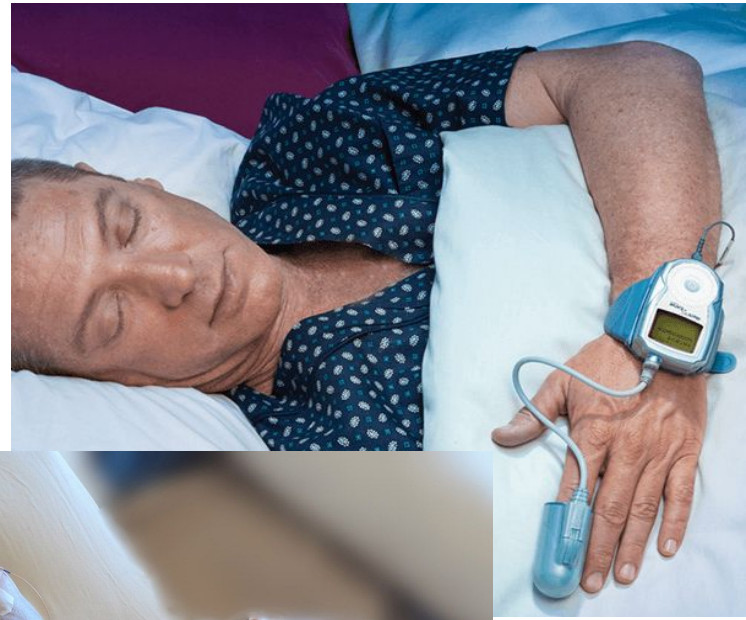
Polysomnogram (The Sleep Study)

collecting data on the breathing

Sleep study

Adults: convenience = popular, but it under-reports by 15%

Kids: must perform in-lab sleep studies.



Multiple definitions: research vs insurance vs clinical differ

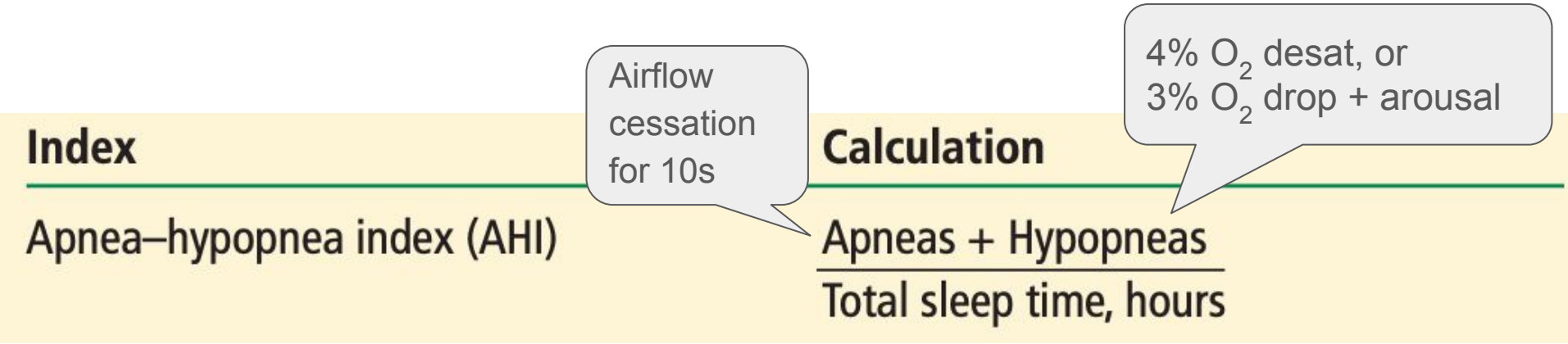
Insurance use to increase threshold for coverage

AASM recommends this to accurately clinical severity

Index	Calculation
Apnea–hypopnea index (AHI)	$\frac{\text{Apneas + Hypopneas}}{\text{Total sleep time, hours}}$
Respiratory disturbance index	$\frac{\text{AHI + Respiratory event-related arousals}}{\text{Total sleep time, hours}}$
Respiratory event index	$\frac{\text{Apneas + Hypopneas}}{\text{Total monitoring time, hours}}$

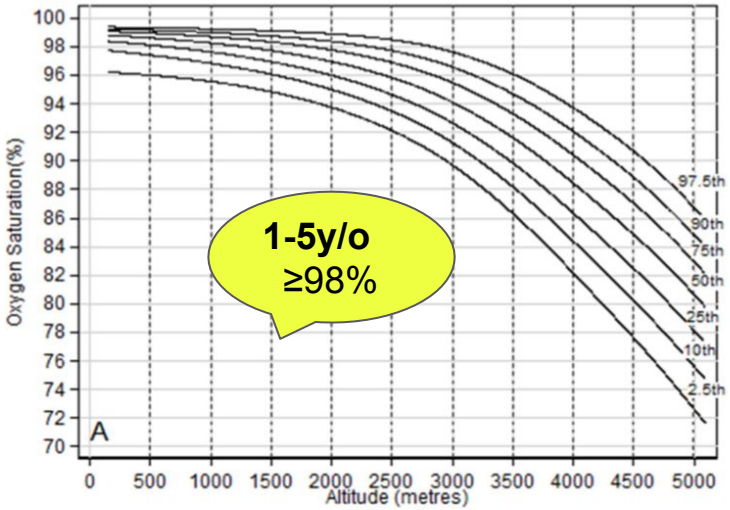
Respiratory event index is typically used for home sleep apnea testing as it is based on monitoring time as distinct from actual sleep time.

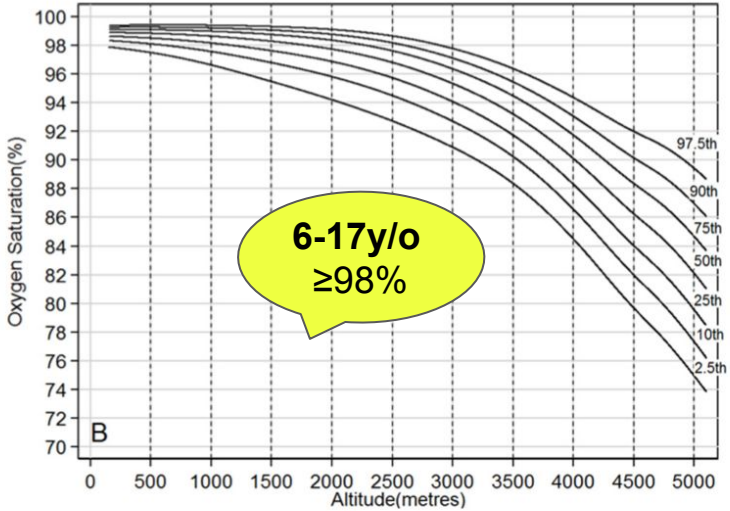
Amer. Academy of Sleep Medicine

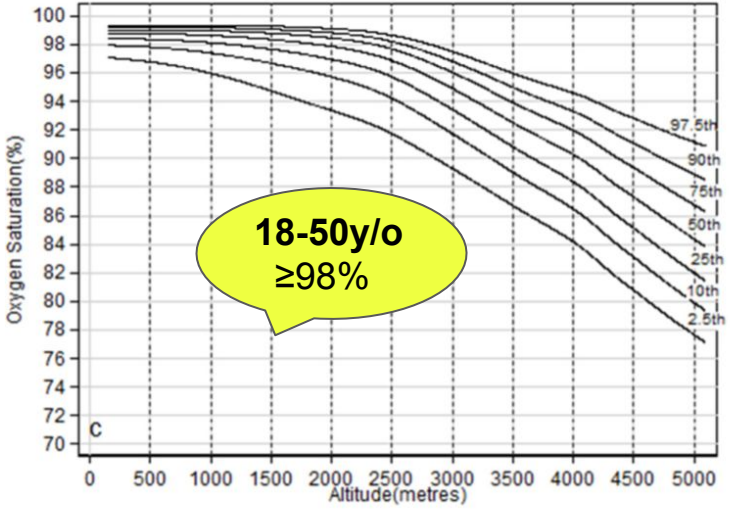


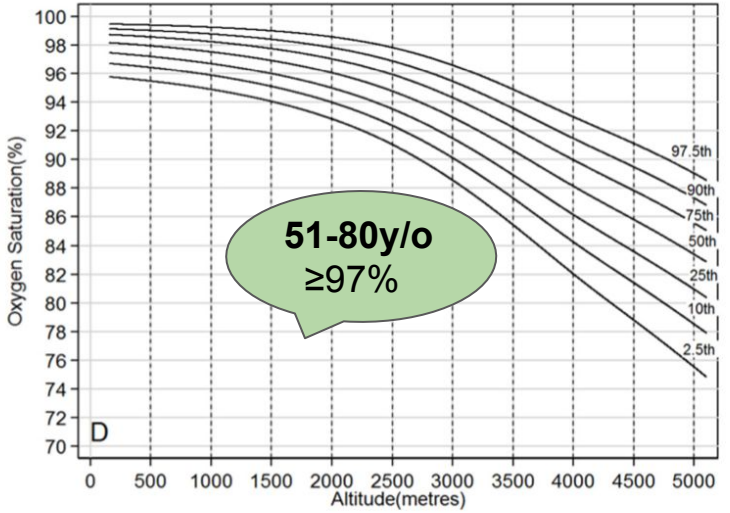
OSA = AHI of adult 5+ / child 1+

Pulse Oximetry Reference Values









Sleep Summary

Start Study Time:	10:31:10 PM
End Study Time:	5:21:03 AM
Total Recording Time:	6 hrs, 49 min
Total Sleep Time	**5 hrs, 55 min**
% REM of Sleep Time:	39.9

Respiratory Indices

	Total Events	REM	NREM	All Night
pRDI:	91	27.1	8.0	**15.6**
pAHI:	36	10.8	3.1	**6.2**
ODI:	7	2.2	0.6	**1.2**

Indices are calculated using technically valid sleep time of 5 hrs, 50 min.

pRDI/pAHI are calculated using oxi desaturations ≥ 3%

Oxygen Saturation Statistics

Mean: 94 Minimum: 82 Maximum: 98

Mean of Desaturations Nadirs (%): 92

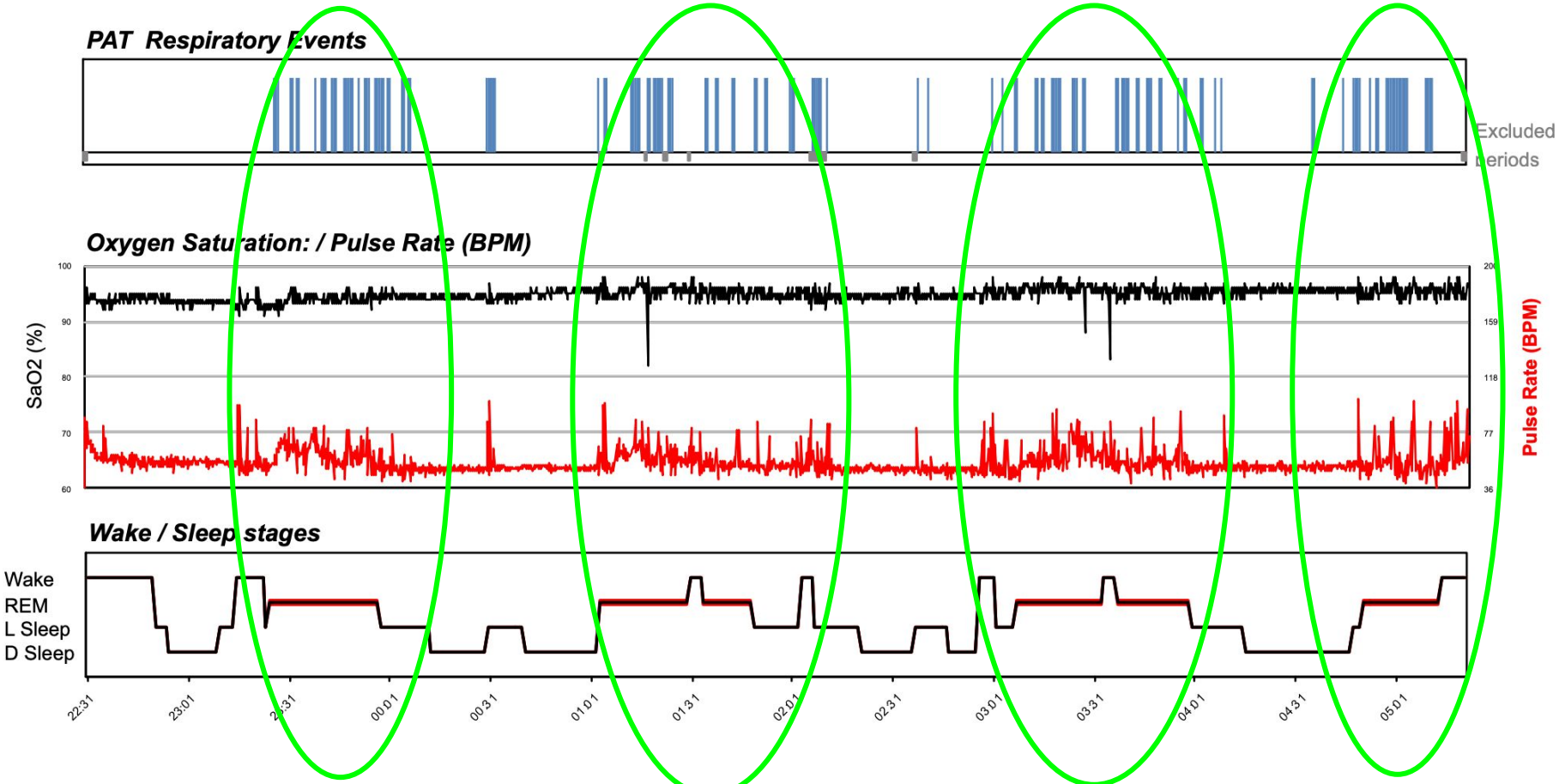
Oxygen Desatur. %:	**4-9**	**10-20**	**>20**	**Total**
Events Number	7	0	0	7
Total	100.0	0.0	0.0	100.0

Oxygen Saturation:	**<90**	**<=88**	**<85**	**<80**	**<70**
Duration (minutes):	0.1	0.1	0.1	0.0	0.0
Sleep %	0.0	0.0	0.0	0.0	0.0

Pulse Rate Statistics during Sleep (BPM)

Mean: 54 Minimum: 35 Maximum: 102

Sleep Fracture: difficulty breathing > sympathetic overdrive > microarousal



As a clinician, what AHI should be we shooting for?

Should it be a number that insurance companies reimburse at?

OR

A “good enough” severity, such as mild?

OR

Should it be correlated with the clinical presentation?

(understanding the presentation of nocturnal cerebral hypoxia)

Management

compensating or correcting the breathing

Referral form checklist

PLEASE CHECK ALL THAT APPLY:

☐ Apnea Observed ☐ Snoring ☐ Gasping at night ☐ Choking ☐ Excessive Daytime Somnolence ☐ Positive "STOP BANG" Screen ☐ Small Oropharyngeal opening ☐ Mallampati grade 1, 2, 3, 4 ☐ Enlarged tongue ☐ Short/thick neck ☐ Enlarged tonsils	☐ Neck circumference > 17 in males, > 16 in females ☐ Retrognathia / Micrognathnia ☐ Recent Weight Gain ___ lbs ☐ Metabolic Syndrome ☐ Difficulties with current CPAP/BiPAP ☐ Hypertension ☐ Cardiac Arrhythmias ☐ Heart Failure	☐ Diabetes ☐ Hypercholesteraemia ☐ Headache during morning hours ☐ Nocturia ☐ Erectile dysfunction ☐ Post Stroke ☐ Nocturnal Seizure ☐ Asthma/COPD ☐ O2 at ____L/min ☐ Bruxism	☐ Fragmented Sleep ☐ Non-Restorative Sleep ☐ Insomnia ☐ Unusual or violent nocturnal movement ☐ REM behavior disorder ("Dream Enactment") ☐ Sleep walking/talking ☐ Restless Legs/Periodic Limb Movements	☐ Depression ☐ Anxiety **CHILDREN (2 Years+)** ☐ Snoring ☐ Failure to grow ☐ ADHD ☐ Craniofacial Abnormalities / Genetic Syndrome

SYMPTOM LIST FOR HMSA/HMAA PATIENTS ("CHEAT SHEET"; if any of these present, patient will qualify for "in Lab" sleep study)

☐ Chronic Insomnia ☐ Teeth grinding (Bruxism) ☐ Obesity BMI > 45 ☐ Obesity hypoventilation syndrome	☐ BMI >35 and unable to lie flat ☐ BMI >35 with pCO2 >45mmHG ☐ COPD/Asthma with pCO2 >45 mm Hg ☐ Pulmonary Hypertension	☐ CHF Class III/IV; LVEF < 45% ☐ Narcolepsy/Cataplexy ☐ Neuromuscular disorder ☐ Restless Legs/Periodic Limb Movements	☐ Unusual or violent nocturnal movement ☐ REM behavior disorder ("Dream Enactment")	☐ Sleep walking/talking ☐ Intellectual disability/mental illness ☐ Child under age 18

http://sleepcenterhawaii.com/referral-forms/

Read the Recommendations to Guide Management

Recommendations

Therapeutic options include: 1. In-lab split night CPAP titration is recommended. 2. If in-lab titration is not possible, a trial of auto-CPAP at 4-12 cm H2O may be considered. 3. Positional therapy can be considered to prevent the patient from sleeping supine and administered using pillows and/or elevating the head by 30 degrees. 4. Good sleep hygiene techniques should be reviewed to improve sleep quality. 5.. Efforts to optimize nasal air flow resistance may be beneficial. 7. Patients with snoring may benefit from the use of a nocturnal mandibular advancement device and it is recommended to by evaluated by an ENT or dentist

Treatments - procedures circumvent compliance

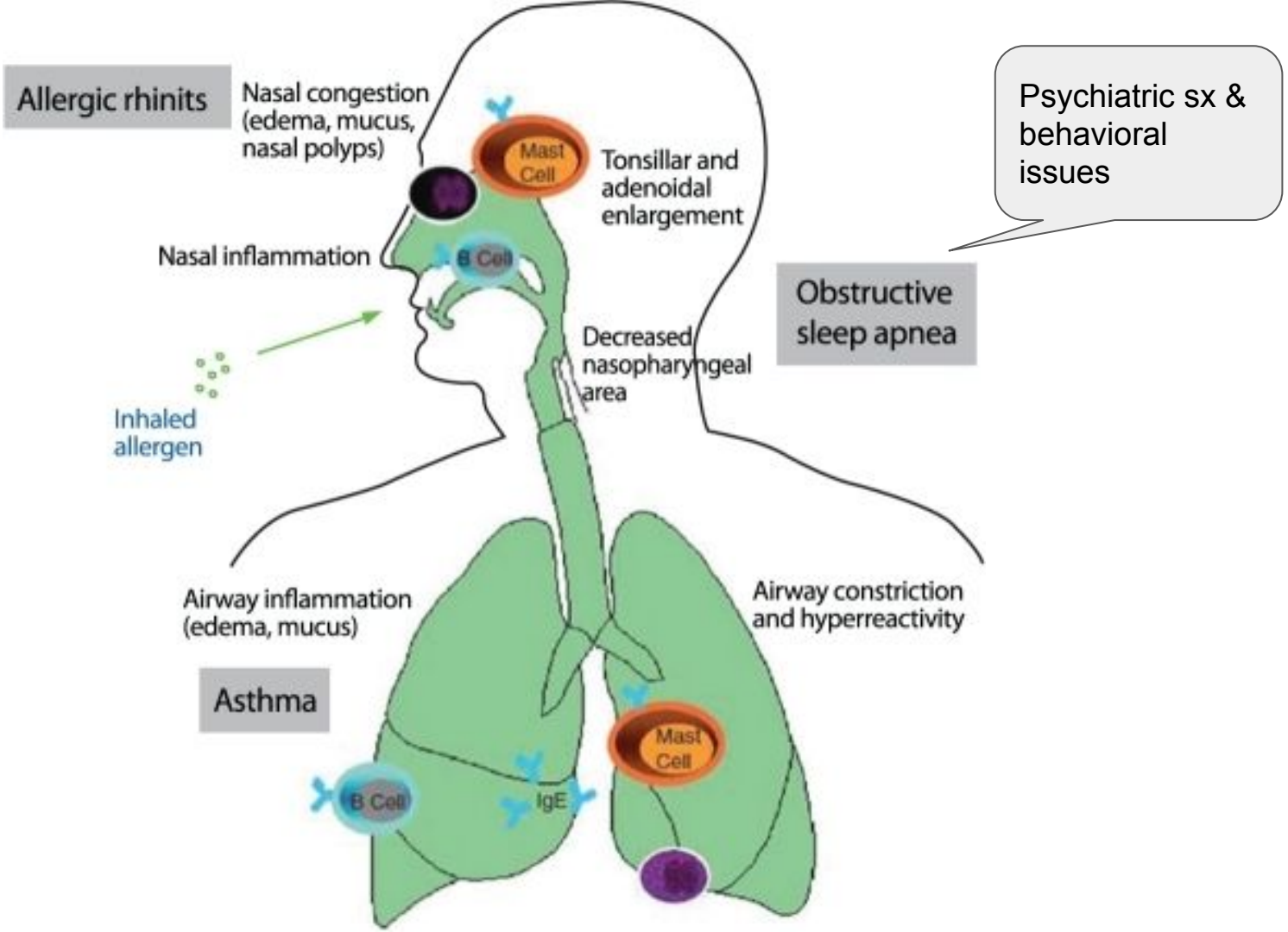
Typically covered:

1. Pharmacologic
2. ENT: sinus & upper airway surgery
3. Weight loss program
4. Pulmonology: Positive Airway Pressure (cPAP/**aPAP**)

Variable coverage: possibly as second or third line options

5. Airway Dentistry: oral appliances or maxillary expansion
6. Oral myofunctional therapist: PT for the airway

Optimizing nasal breathing


Allergic rhinits
Nasal congestion (edema, mucus, nasal polyps)
Mast Cell
Tonsillar and adenoidal enlargement
Nasal inflammation
B Cell
Psychiatric sx & behavioral issues
Obstructive sleep apnea
Decreased nasopharyngeal area
Inhaled allergen
Airway inflammation (edema, mucus)
Airway constriction and hyperreactivity
Asthma
Mast Cell
B Cell
IgE

ENT procedures:

Tonsillectomy & Adenoidectomy:

- Effective at resolving OSA in 50% of kids.
- Watchful waiting of airway maturation considered by some - weigh the risks of a rapidly developing brain and presenting concern of patient vs surgery

Turbinectomy:

- 227 children <10 years of age who underwent inferior turbinectomy
- Nocturnal breathing was reported to be more regular and otherwise improved in the 36 children with a suspected history of sleep apnea.
- 42 of 47 children who had thick nasal secretions and failed antibiotic therapy had significant relief

Weight loss - challenging but worth it!

10% drop in BMI = 30% reduction in AHI

E.g.: Going from obese to overweight (BMI 30 → 27)

5’9” person would have to lose 20lbs

5’4” person would have to lose 15lbs

Effect mediated by reduced adipose tissue in neck, pharynx, and tongue & increased airway muscle tone. Limited evidence, but aerobic activity proving to be most effective for the latter.

CPAP Airflow

- Stands for **Continuous Positive Airway Pressure**
- Provides **a single set pressure** throughout your sleep
- Generally **more affordable**
- Not as great for accomodating changes in breathing

CONSTANT SET PRESSURE DURING INHALE

PRESSURE RELIEF DURING EXHALE

APAP Airflow

- Stands for **Automatic Positive Airway Pressure**
- **Self adjusts on a breath-by-breath basis**
- Generally **more comfortable for new users**
- Great for when your **breathing fluctuates** (allergy season, flu, etc.)

VARIABLE PRESSURE DURING INHALE

PRESSURE RELIEF DURING EXHALE

Auto-PAP Prescription

[date]

Patient: [xxx], DOB: [xxx]

Please provide the following:

1. auto-cpap machine w humidifier, pressure range 4-10mmgHg, 99 months
2. Initial dispense of all necessary supplies, which may include: Headgear, Chinstrap, Filters, Heated Tubing, Nasal Cushion or Nasal Pillows, Humidifier Chamber, Humidifier Heater

See attached for demographics, insurance, sleep study, and note indicating sleep study.

Regards,

[signature]
[name]
[specialty]
[NPI]

Help them w their device ASAP!

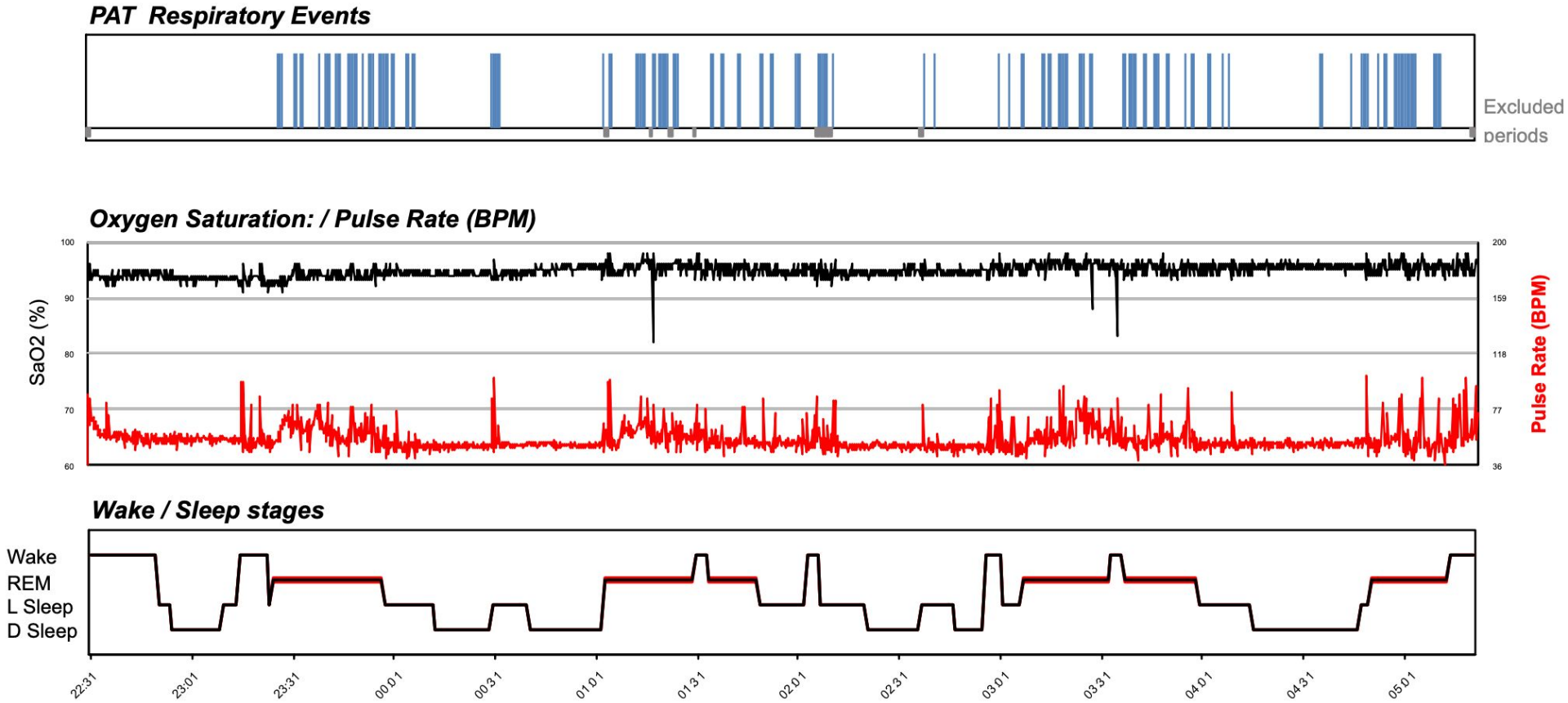
- Adherence at 1mo is a predictor of adherence at 12mos
- Have them bring in the device at the follow-up appointment.
  - Mask-phobia → wear it while watching TV
  - Sore throat → turn up humidity
  - Mask uncomfortable or air leak → change size or shape
  - Mouth breathing → taping or full face mask
- Track adherence w device software
- Refer back to device supplier
- Engage family & therapist

Explain the risks of no treatment

RCT of 70 with OSA & CVD

- Intervention: positively or negatively framed education about CPAP.
- CPAP use was greater in the group receiving negative message framing

Sleep Study - use to educate the patient



Follow-up closely

Moderate & severe cases of OSA may not completely resolve w 1 intervention.

Re-test sleep study as clinically indicated to assess intervention.

Ongoing revision of sleep duration and hygiene.

Long Term Effects

of breathing well…

What an extra day & an extra hour of CPAP use will do

3100 patients w newly dx of sleep apnoea randomised into usual follow-up care, or the intensive group: additional visits, telephone calls and education.

	Standard	Intensive	p-value
% days CPAP used a week	75.1±23.9	88.1±8.2	<0.001
Days CPAP used a week	5.2±2.3	6.2±3.9	<0.001
Hours per night, on nights CPAP was used#	5.2±2.2	6.9±1.8	<0.001
Regular use of CPAP %	79.8	92.8	<0.001

Bouloukaki I, Giannadaki K, Mermigkis C, Tzanakis N, Mauroudi E, Moniaki V, Michelakis S, Siafakas NM, Schiza SE. Intensive versus standard follow-up to improve continuous positive airway pressure compliance. Eur Respir J. 2014 Nov;44(5):1262-74. doi: 10.1183/09031936.00021314. Epub 2014 Jul 3. PMID: 24993911.

An extra hour & extra day use further improved depression & QoL

	Standard group				Intensive group				p-value[#]
	Baseline	24 months	Difference (improvement)	p-value	Baseline	24 months	Difference (improvement)	p-value	
ESS	11.5±5.8	7.2±4.3	4.3±6.1	<0.001	12.7±5.4	4.2±1.6	8.1±6.0	<0.001	<0.001
BDI	15.5±8.0	11.1±6.8	3.7±8.2	0.04	15.1±7.0	7.8±5.9	7.0±7.8	<0.001	<0.001
SF-36 physical component	75.6±6.9	81.7±18.2	5.9±11.4	0.006	74.9±8.5	86.3±6.2	11.6±7.7	<0.001	<0.001
SF-36 mental health component	79.3±8.4	88. 6±9.8	8.9±6.9	0.007	78.5±7.6	92.2±8.5	12.9±10.1	<0.001	<0.001

ESS: Epworth Sleepiness Scale; BDI: Beck Depression Inventory; SF-36: 36-item Short Form Health Survey. [#]: intensive *versus* standard group at 24 months.

Bouloukaki I, Giannadaki K, Mermigkis C, Tzanakis N, Mauroudi E, Moniaki V, Michelakis S, Siafakas NM, Schiza SE. Intensive versus standard follow-up to improve continuous positive airway pressure compliance. Eur Respir J. 2014 Nov;44(5):1262-74. doi: 10.1183/09031936.00021314. Epub 2014 Jul 3. PMID: 24993911.

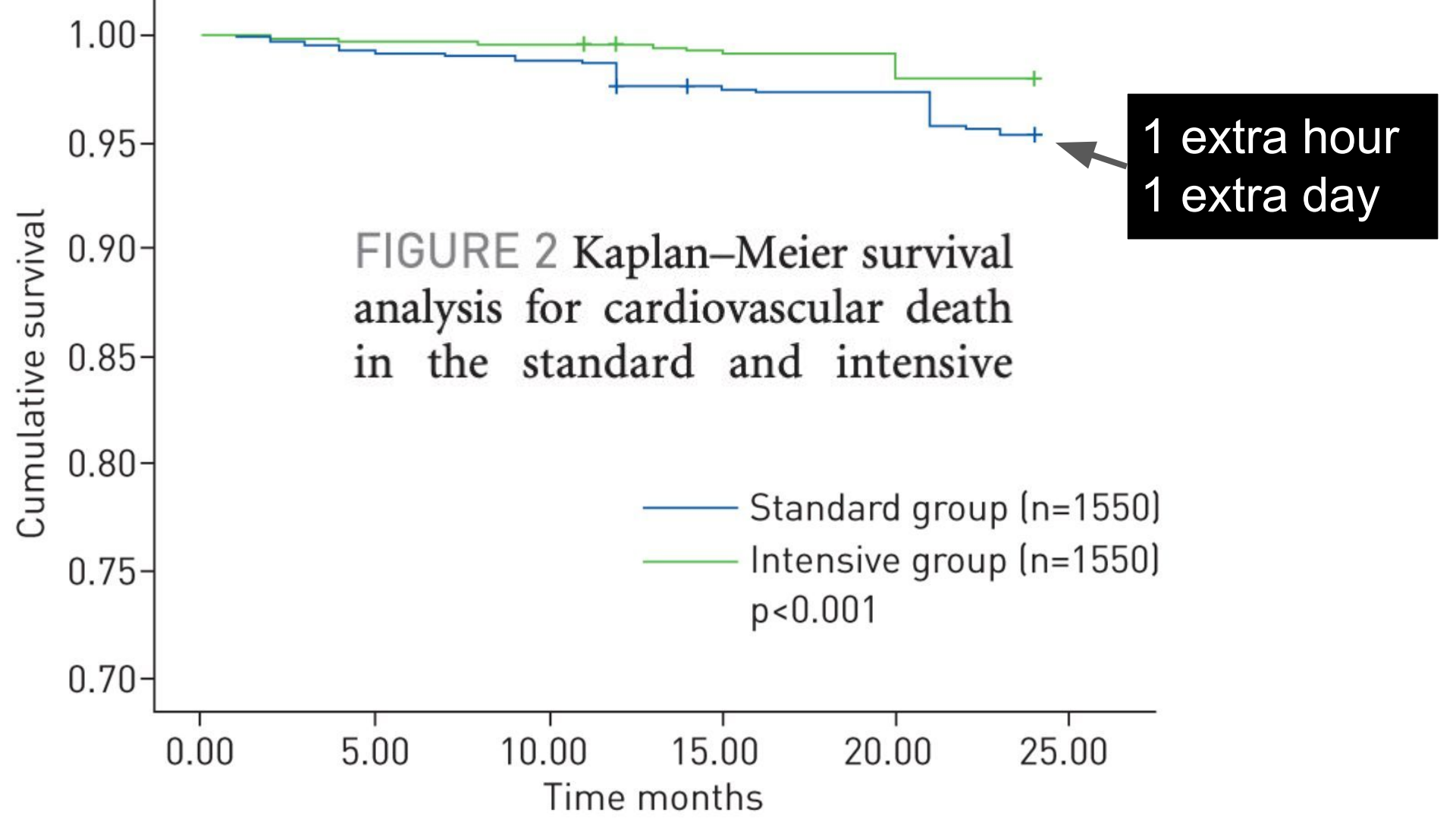


FIGURE 2 Kaplan–Meier survival analysis for cardiovascular death in the standard and intensive

In Summary

1. Psych sx = Brain sx = Airway dysfunction in many cases
2. Time from referral to treatment = 6-12mos; refer early (on intake appt)
3. Screen sleep in your ROS & make psych symptoms a part of it
    a. The sleep ROS are all reasons to refer for sleep studies.
4. The head & neck informs of the airway
5. Learn to read sleep data to understand the clinical presentation
6. Tx adherence determines symptom remission
7. Consider the value of curative options

Thank You - questions or cases?

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