

Sleep Matters for Aviation



TUG March 19, 2014



Dr. Carol Ash
Corporate Director Sleep Medicine Meridian Health



Make a difference.

DATE

\$

DOLLARS



Security
Features
Details
Back.

What would you do?

What did I do?

A story of

Purpose

Corey and Jennifer Briest

[? Bravest Family in America - YouTube](#)

Sleep Apnea FAA Proposal

- FAA proposal
 - Pilots with a body mass index (BMI) of 40 or greater would have been required to undergo testing for sleep apnea.
 - The FAA said it planned to expand the policy to include all pilots with a BMI of 30 or greater.
 - The FAA later stepped back from that proposal, the general aviation community was disturbed that stakeholder input had not been sought in crafting the plan.
 - No fatal aviation accident has ever been attributed to sleep apnea.
 - <http://www.aopa.org/News-and-Video/All-News/2014/March/05/Aviation-associations-ask-Senate-to-pass-sleep-apnea-bill.aspx>

Aviation Sleep Bill

- Nine aviation organizations, including Aircraft Owners and Pilots Association (AOPA), have joined forces to express support for a Senate bill that would compel the FAA to use the rulemaking process before enacting any new policies regarding sleep disorders. An identical measure passed last month in the House.
- FAA's original proposal would have been costly and delivered no clear safety benefits

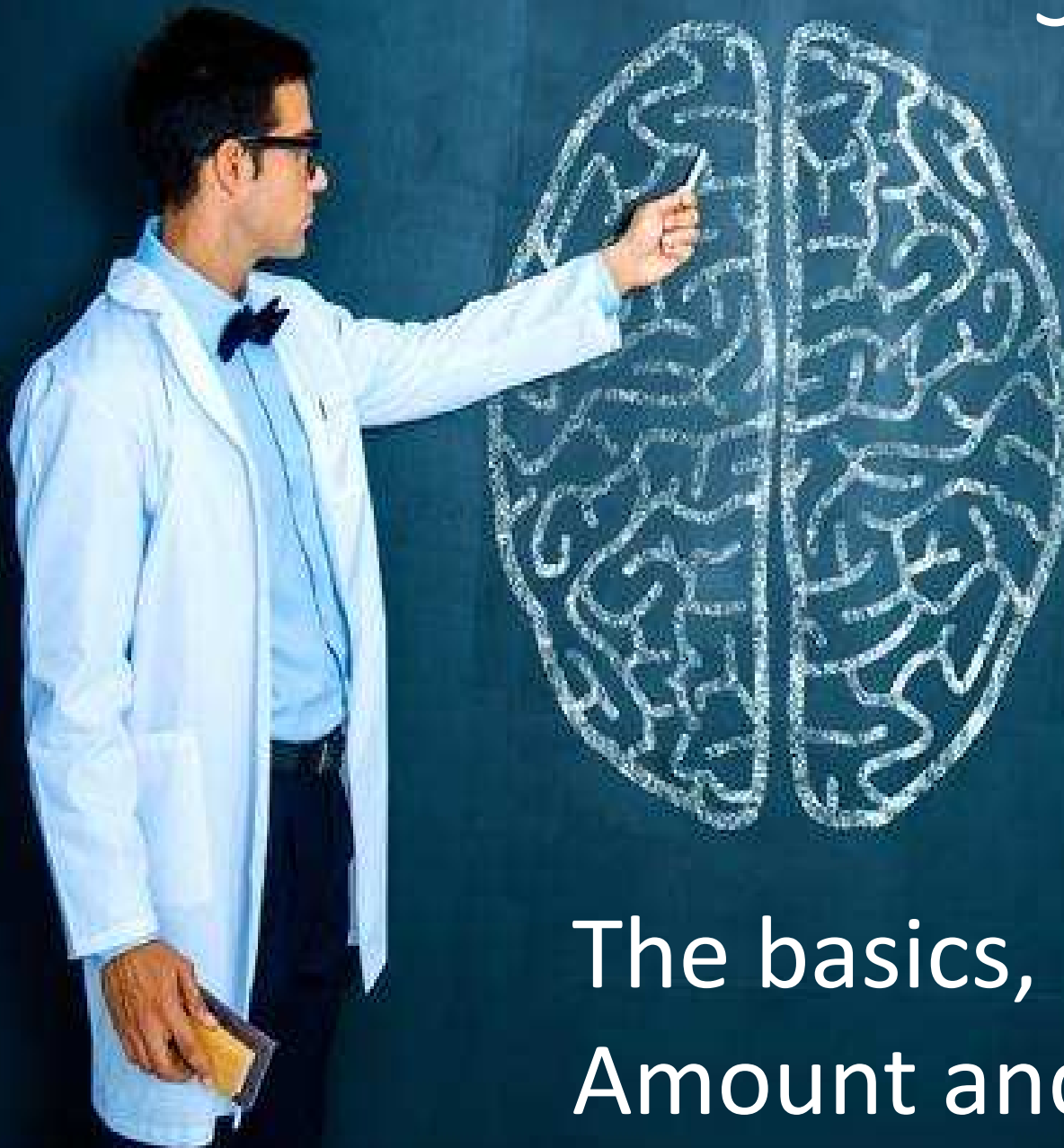
Fatigue FAA

Operational Standpoint

- “Fatigue is a condition characterized by increased discomfort with lessened capacity for work, reduced efficiency of accomplishment, loss of power or capacity to respond to stimulation, and is usually accompanied by a feeling of weariness and tiredness.”

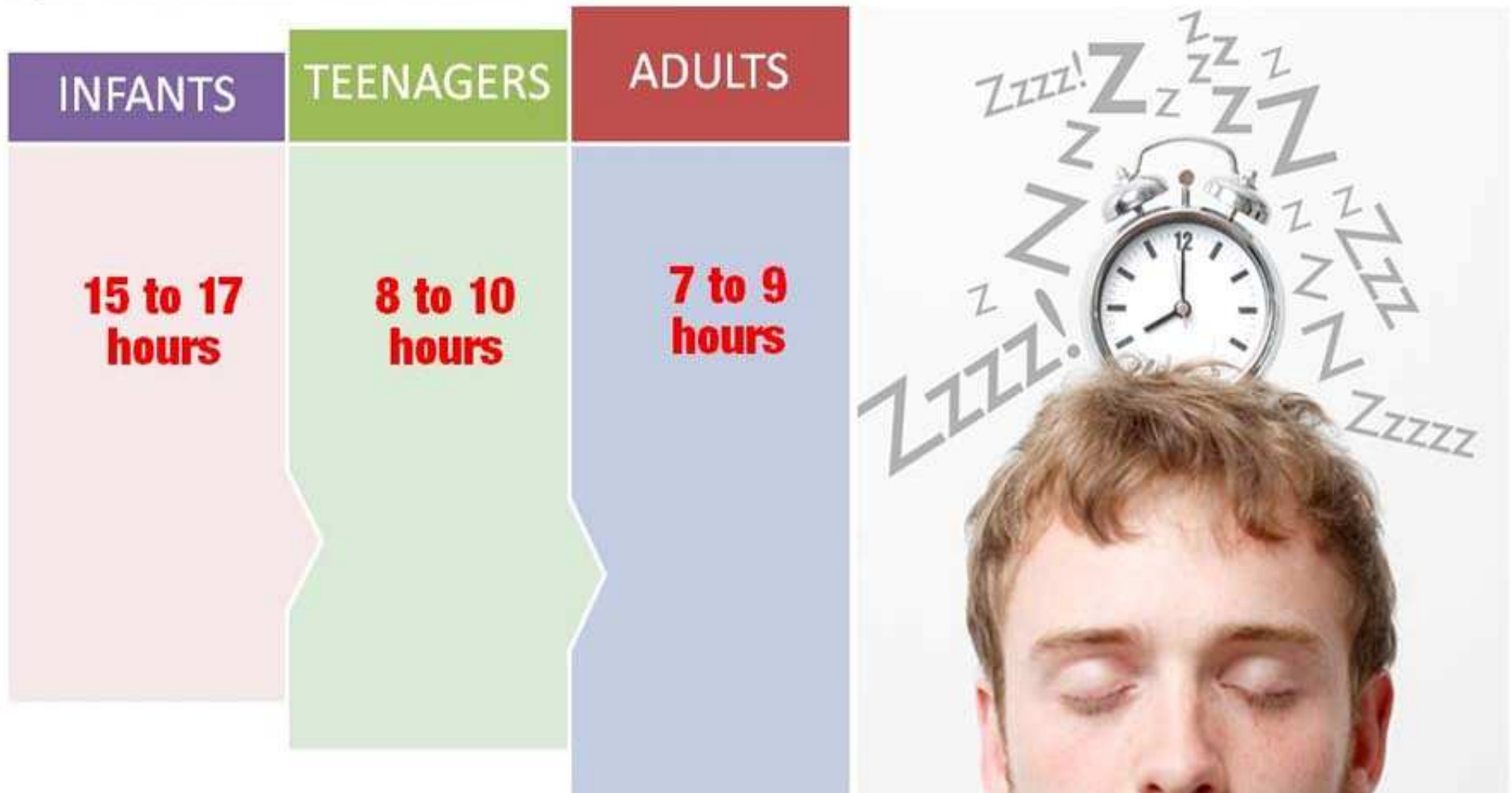
http://www.faa.gov/pilots/safety/pilotsafetybrochures/media/Fatigue_Aviation.pdf

Sleep 101



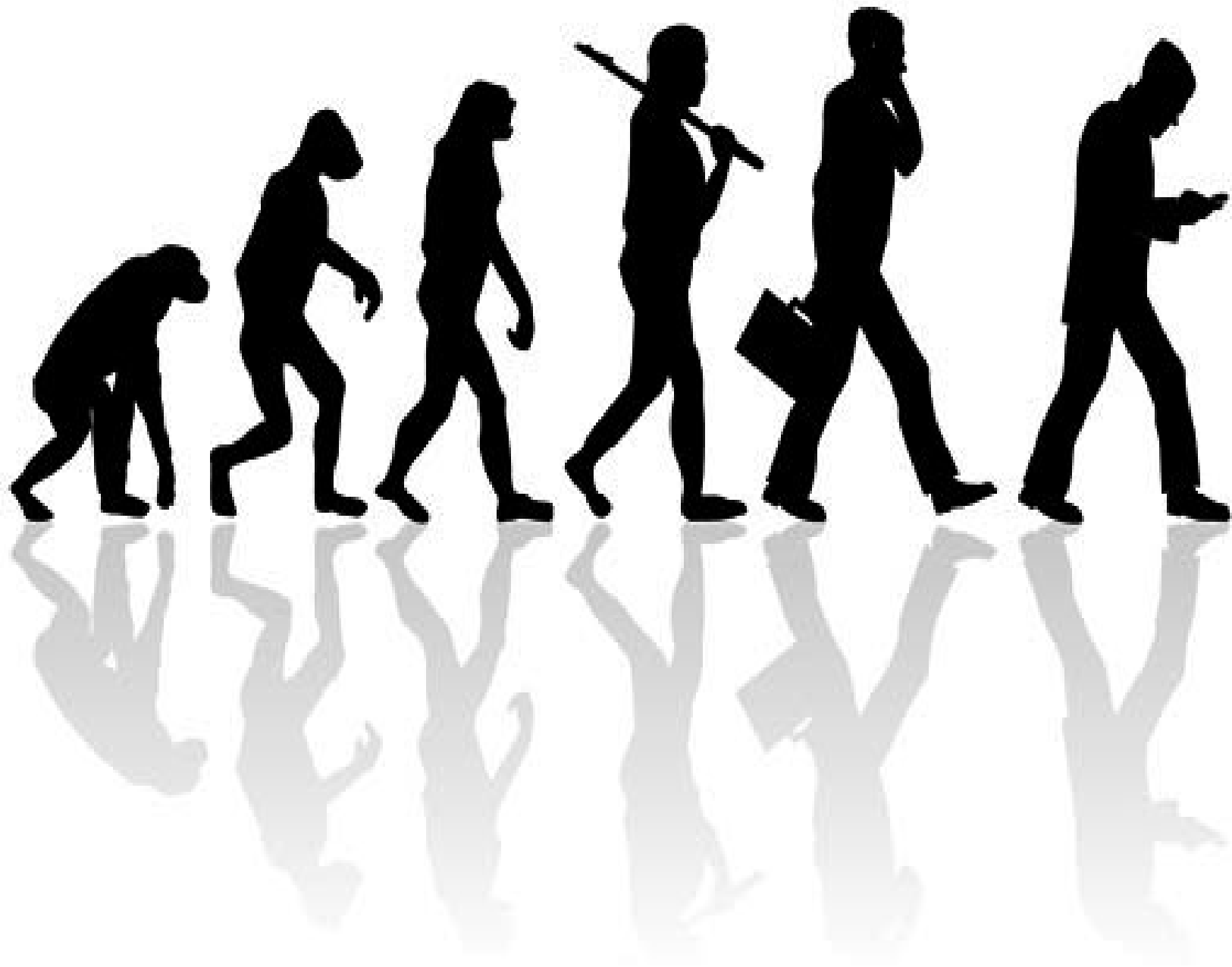
The basics,
Amount and Timing

How much sleep do we need?



A surrealist painting featuring a woman with long, flowing blonde hair. Instead of a head, she has a large, antique-style clock face. The clock has a yellowish-green patina and black hands. She is wearing a blue and white vertically striped garment. Her mouth is open in a wide, expressive shape. The background is a deep blue, textured surface with a bright, multi-pointed starburst of light in the upper right. Several small, golden, insect-like figures are scattered in the background. The overall style is dreamlike and symbolic.

The Internal Clock





Lifestyle



Illness



Medication

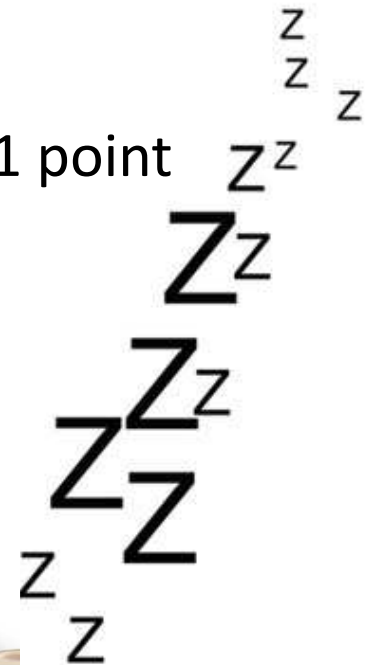


Lion

Survey results

How is this group doing?

- Do you consider yourself a good sleeper? No = 1 point
- Do you get 7-9 hours of sleep? No = 1 point
- Do you sleep in on weekends? Yes = 1 point
- Trouble falling asleep or wake up frequently? Yes = 1 point
- Do you feel rested? ESS < 10? No = 1 point
- Next Stop Bang



Stop-Bang Sleep Apnea Questionnaire

1. Snoring

Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?

Yes No

2. Tired

Do you often feel tired, fatigued, or sleepy during daytime?

Yes No

3. Observed

Has anyone observed you stop breathing during your sleep?

Yes No

4. Blood pressure

Do you have or are you being treated for high blood pressure?

Yes No

5. BMI

BMI more than 35 kg/m²? (obese)

Yes No

6. Age

Age over 50 yr old?

Yes No

7. Neck circumference

Neck circumference greater than 40 cm?

Yes No

8. Gender

Gender male?

Yes No

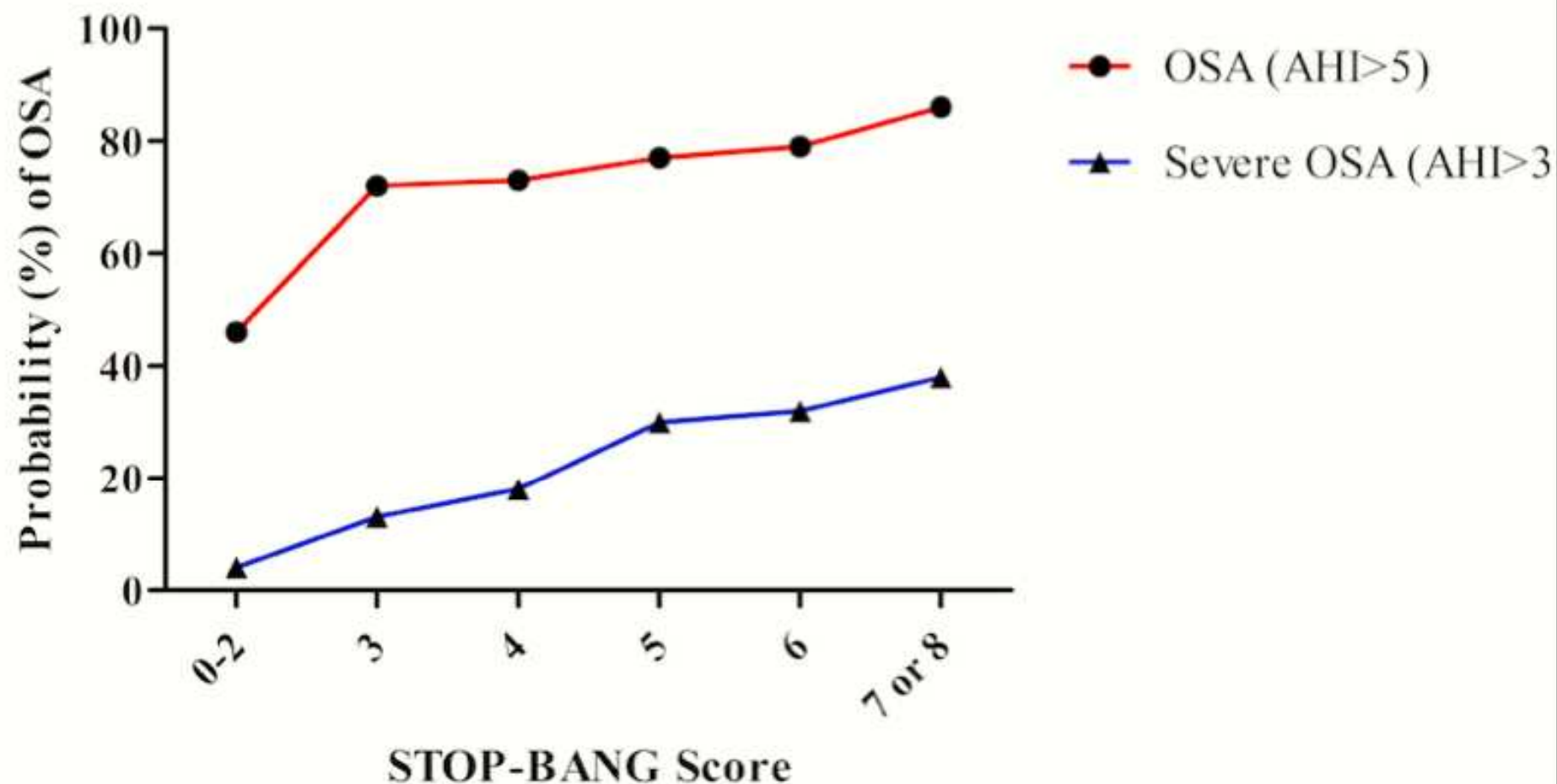
High risk of OSA: answering yes to three or more items

Low risk of OSA: answering yes to less than three items

“sensitivity varied from 76% to 96%, and the specificity ranged from 13% to 54%.” – ie. – will pick it up but lots other things can cause those problems like restless legs

Anesthesiology 2008; 108:812–21 STOP Questionnaire: A Tool to Screen Patients for Obstructive Sleep Apnea. Frances Chung et al

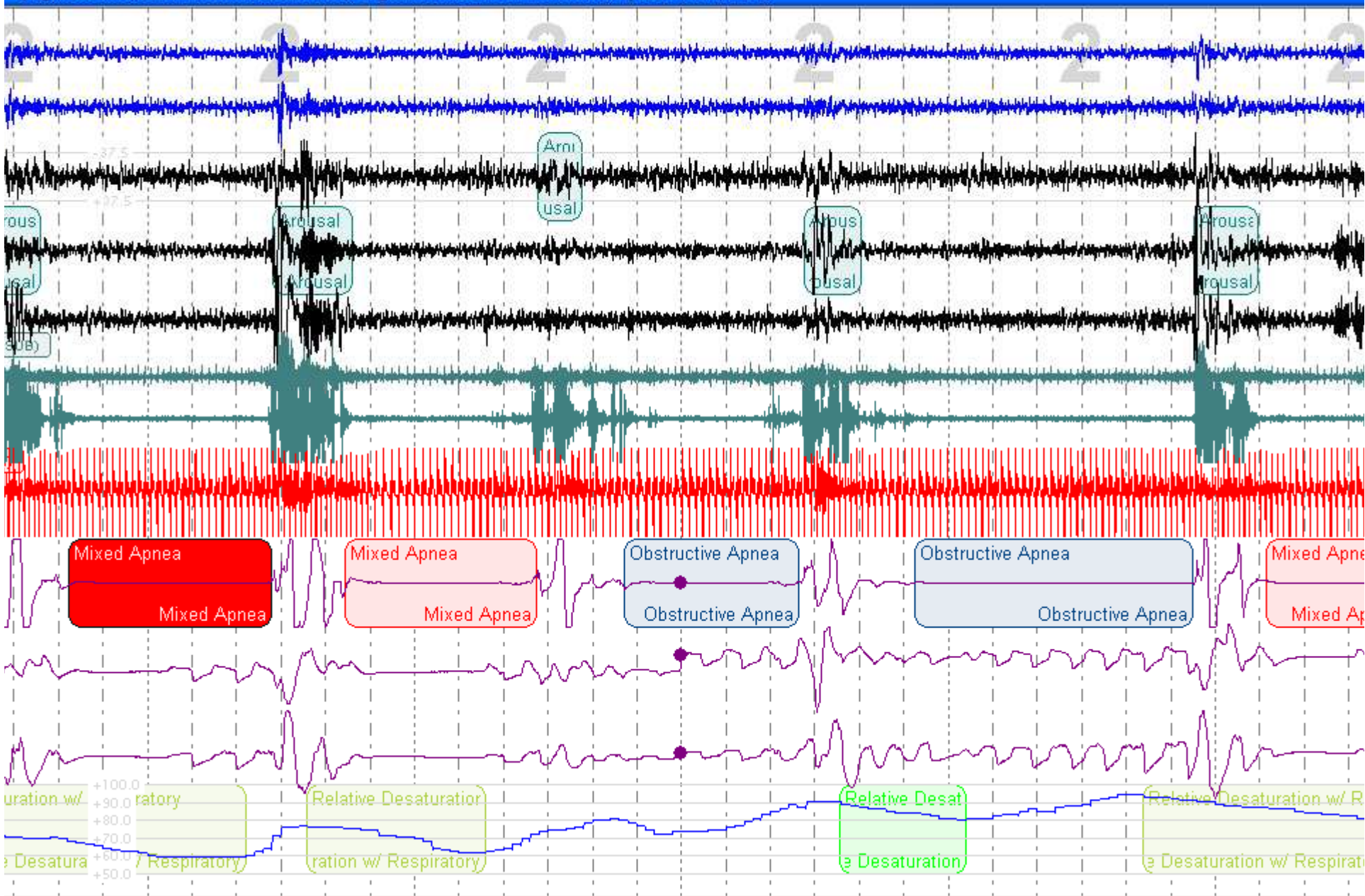
Figure 1. Predicted Probability of OSA based on STOP-Bang Score



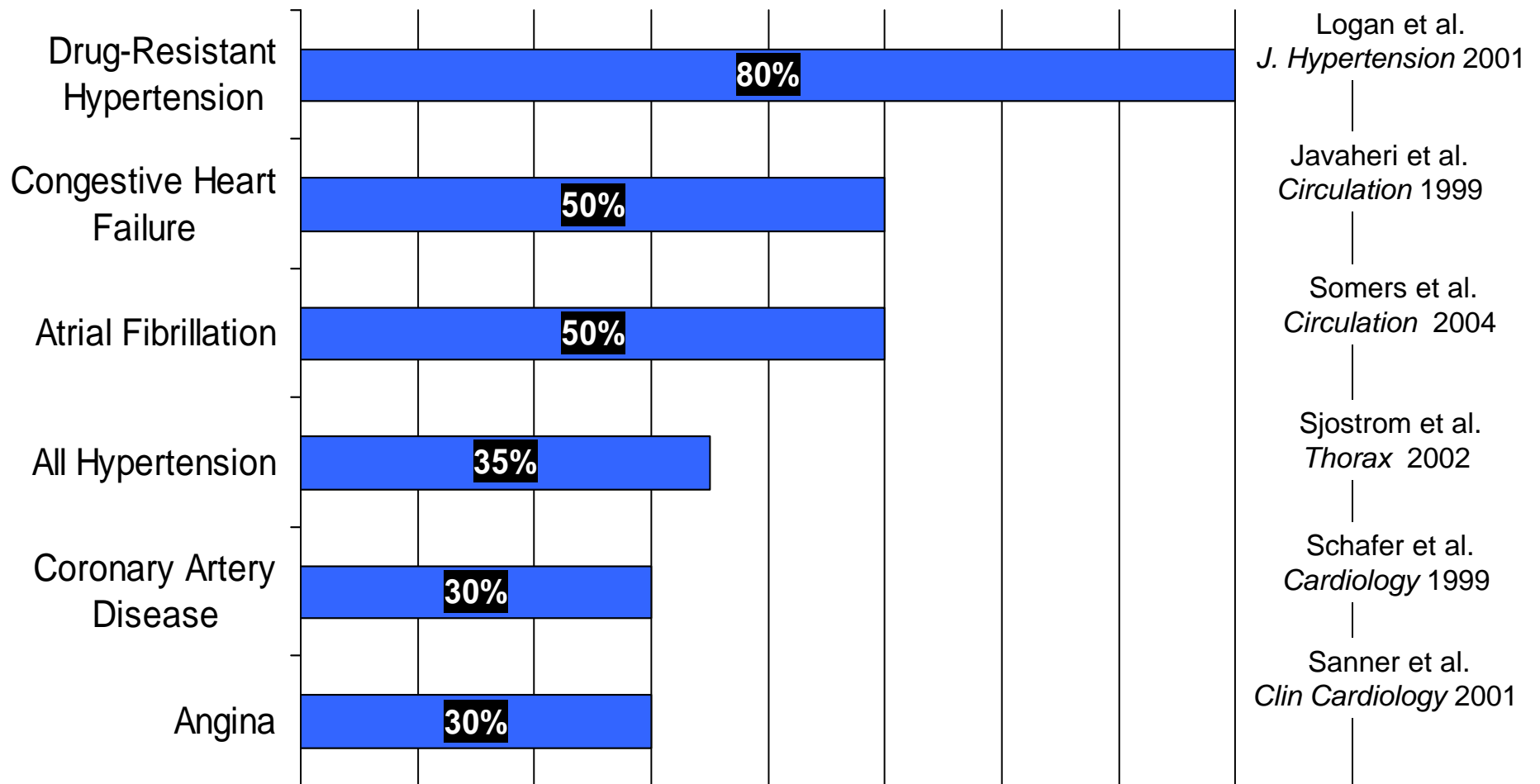
Note. The red line represents the predicted probability that a patient with a given STOP-BANG score will have OSA of any severity. The blue line represents the predicted probability that a patient will have severe OSA for a given STOP-BANG score. As the scores increased so did the probability of having any degree of OSA (AHI >5) or severe OSA (AHI >30). The lower probabilities for severe OSA as compared to any degree of OSA are probably due to the lower overall incidence of severe OSA in this surgical population.

We talk about the benefits of breathing and look at this. This will kill yo

- psg, massm (Score Dir: M.HALSCHIED), Signal Window. 1:47:36 AM, Epoch 353 (180s)



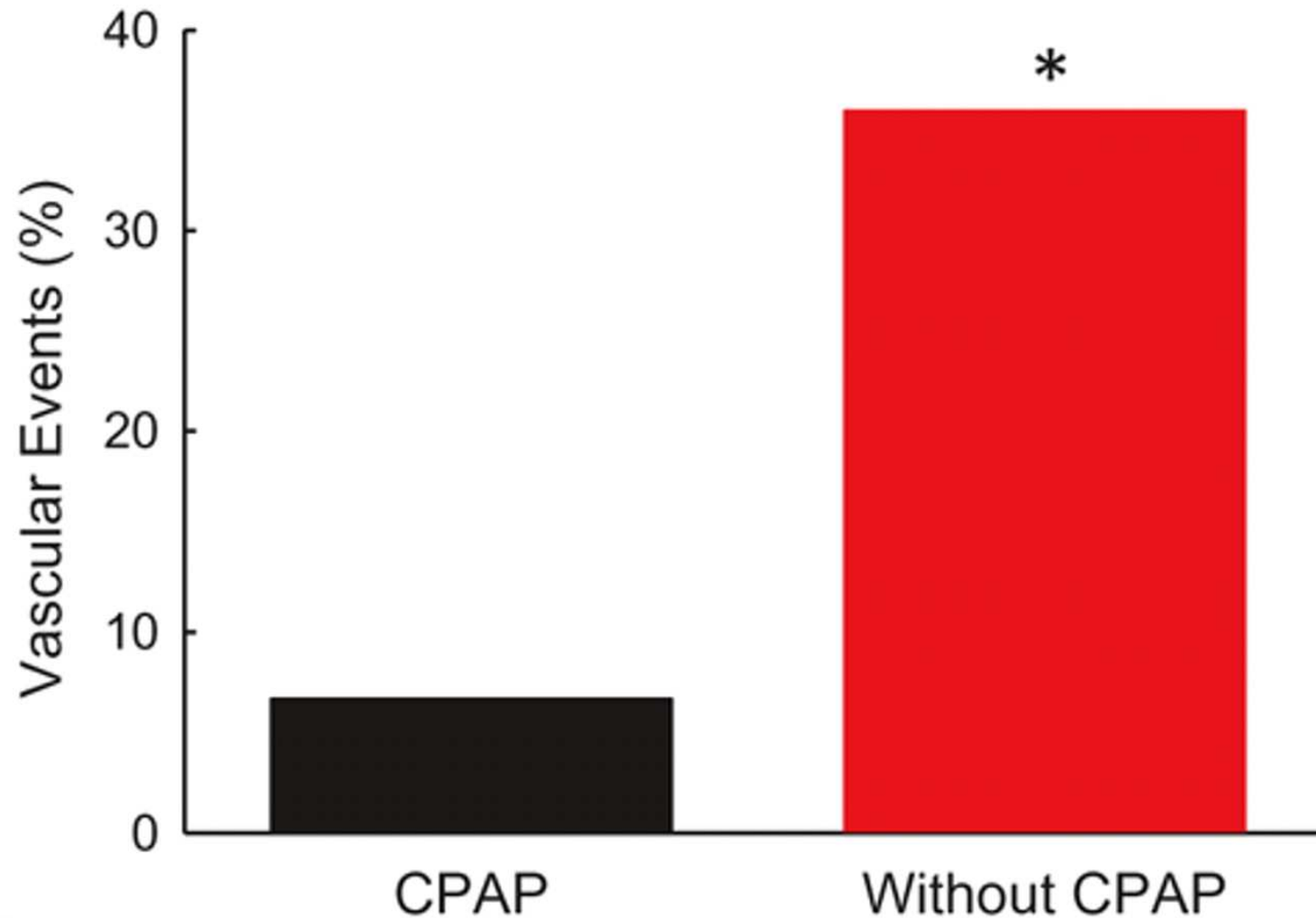
Sleep Apnea Prevalence in CVD Patients



Independent Predictors of MI

| | Relative Risk | 95% Conf. Lim | p |
|-------------------------------------|--------------------------|--------------------------|----------|
| BMI >28 | 7.1 | 1.9-26.6 | <0.005 |
| HTN | 7.8 | 2.4-25.4 | <0.001 |
| Smoking | 11.1 | 3.1-39.5 | <0.001 |
| Apnea Index > 5.3 | 23.3 | 3.9-139.9 | <0.001 |

Incidence of vascular events over an 18-month period after stroke in CPAP users (n=15) and those who discontinued the use of CPAP (n=36).



Sleep disorders

80 of them

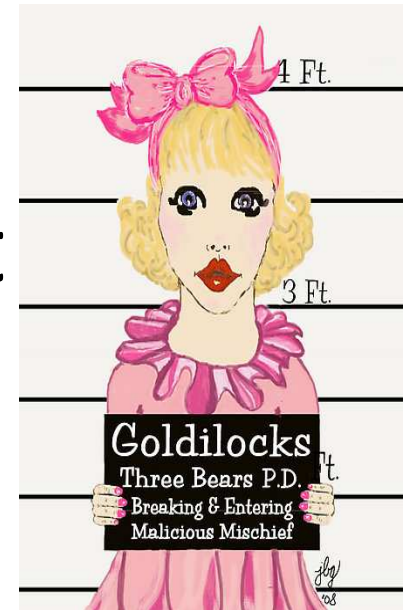
- Is snoring really all that bad?
 - Causes deafness
 - OSHA violation
 - Causes increased thickness of carotid artery
- Restless legs - disrupts sleep
- Sleep apnea- you are not fixing it alone



Consequences

When sleep isn't just right

- Those sleeping <6 hours per night
- 66% more likely to have hypertension
- Increased risk for cardiovascular disease
- Impaired glucose tolerance, diabetes
- Short sleep and insomnia linked to 4 x higher risk early death in men
- Weight gain
- Alters activity of 700 genes that code for stress, metabolism, immunity
- Poor performance. Executive brain functions impaired. Fragile emotions.
- ADHD - Children who do not get enough sleep may display symptoms including moodiness, tantrums and hyperactive behavior
- Quality sleep is the competitive edge



[Prog Cardiovasc Dis. 2009 Jan-Feb; 51\(4\): 294–302.](#)

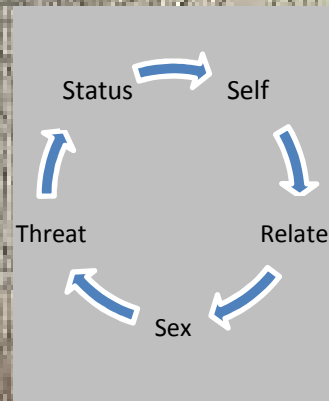
"Insomnia with Short Sleep Duration and Mortality: The Penn State Cohort." Vgontzas et al; Sleep, September 2010.

You have two separate operating systems
Prefrontal cortex must disengage to allow
Right brain to fire up.

Meditation, breathing
facilitate this process.
Racing thoughts. You are
stuck in the loop.

Left Brain

Convergent thinking
Detail oriented
Analytical
Math
Language
Logic
Music musicians



Right Brain

Divergent thinking
Intuition
Holistic
Spatial
Pattern Recognition
Art symbolism
Music nonmusicians

Quiet Racing Thoughts

Racing thoughts

- Taming the lion in the room
- Name it to tame it – Reality check
- Identify sympathetic activation shut it down
- Just breath



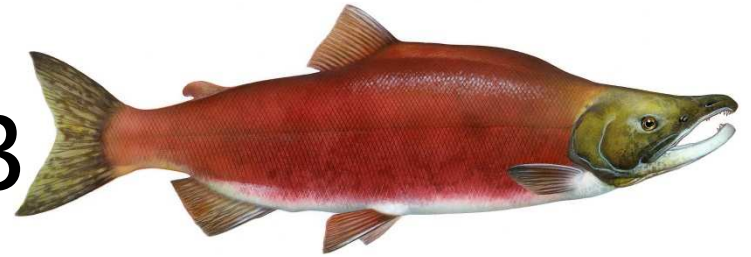
Mindfulness focus on the present

- To use the skilled focus of attention to change the mind—enables us to amplify the activity of certain pathways and inhibit others.
Without this refined inner view of the mind itself, such discrimination among specific patterns of neural firing is not possible.

Focus Really Matters

- Why would the way we focus our attention matter for the quality of our lives?
- When we refine the way in which we see the fabric of the mind itself it becomes possible to intentionally alter the way information flows through it.
- Seeing the mind with more depth and clarity allows the mind to regulate the flow of energy (pattern of neural firing) and information in it (neural connections)
- Allows you to be transformed
- Sleep deprivation impairs this process

Omega 3



- Higher levels of omega-3 DHA, fatty acids found in algae and seafood, are associated with better sleep
- Study by the University of Oxford due to be published in the Journal of Sleep Research
- 16 weeks of daily 600 mg supplements of algal sources would improve the sleep of 362 children
- Not selected for sleep problems, but were all struggling readers at a mainstream primary school

NSF Sleep In America Poll 2013

- Vigorous exercisers almost twice as likely to have good sleep every night
- They also are the least likely to report sleep problems.
- More than two-thirds of vigorous exercisers rarely or never (in the past 2 weeks) had insomnia symptoms insomnia. NO difficulty with
 - 72 % , waking up too early and not being able to get back to sleep
 - 69% difficulty falling asleep
- In contrast, one-half (50%) of non-exercisers say they woke up during the night and nearly one-fourth (24%) had difficulty falling asleep every night or almost every night

Non exercisers

- Have the highest risk for sleep apnea
- Are more excessively sleepy than exercisers
- Nearly one-fourth of non-exercisers (24%) qualify as “sleepy” using a standard excessive sleepiness clinical screening measure.
- Six in ten of non-exercisers (61%) say they rarely or never have a good night’s sleep on work nights

Things you can do

- Sleep habits
 - Set rules
 - Quiet, dark and cool
 - White noise machines
 - No electronics
 - Optimize the room temperature 65-72. Wear socks.
 - Comfortable mattress, pillow, calm colors
 - Diet, Exercise
 - Just breath, resiliency, shut down racing thoughts

Reality Check

- Recognize the threat
- Competence
- Autonomy
- Relatedness
- Basic human needs
- Perceived threats activate fight or flight
- Recognize sympathetic systems



Refocus and Do

- Having recognized the problem for what it is and why it's occurring, you now have to replace the old behavior with new things to do
- This is where the change in brain chemistry occurs, because you are creating new patterns, new mindsets. By refusing to be misled by the old messages, by understanding they aren't what they tell you they are, your mind is now the one in charge of your brain.
- It is in the doing you rewire

Revalue and find Purpose

- The need for purpose is one the defining characteristics of human beings
- Purpose calms racing thoughts.
- Focuses our attention externally
- Gives us a constant source of activity to channel our mental energies
- Spend less immersed in chatter of our minds
- Makes us less self-centered.
- We feel a part of something bigger,
- Outside ourselves, and this makes us less focused on our own worries and anxieties.

Purpose

- When we don't have a sense of purpose in our lives. It makes us more vulnerable to boredom, anxiety you never get up in the morning wondering what you're going to do with yourself. When you're 'in purpose' - that is, engaged with and working towards your purpose - life becomes easier, less complicated and stressful. You become more focused, like an arrow flying towards its target. There is less space for negativity.

Healthy Sleep Advice

- Eat Mediterranean diet high in omega three
- Exercise regularly. Any time of day.
- Create a sleep environment. That is quiet, dark and cool with a comfortable mattress and pillows.
- Practice a relaxing bedtime ritual
- Go to sleep and wake at the same time every day, and avoid spending more time in bed than needed.
- Use bright light to help manage your "body clock." Avoid bright light in the evening and expose yourself to sunlight in the morning.
- Use your bedroom only for sleep
- Remove work materials, computers and televisions from your bedroom.
- Save your worries for the daytime.
- If you can't sleep, go into another room and do something relaxing until you feel tired.
- If you are experiencing excessive daytime sleepiness, snoring, or “stop breathing” episodes in your sleep, contact your health care professional for a sleep apnea screening



Wake up the day to take back the night.

And...

Find Purpose

A person stands on a beach at sunset, their silhouette dark against the bright orange and yellow sky. Their arms are outstretched to the sides, embracing the horizon. The sun is low, creating a long, shimmering reflection on the wet sand. The sky is filled with dramatic, dark clouds that catch the low light of the setting sun.

SEIZE

LIFE

EXPERIENCE

EVERYTHING

with

PURPOSE

Q & A

