

Sleep Disordered Breathing in Hospitalized Patients.



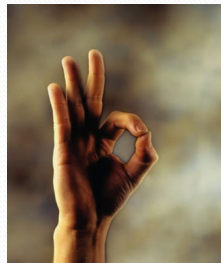
Objectives

- 1) Identifying who is at risk ?
- 2) Brief Review of SDB ?
- 3) Treatment plan ?

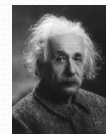
Tonight's Speaker

- Domingo Rodriguez-Cue M.D.
- Board Certified in Family Practice and Sleep Medicine
- Medical Director:
 - Integra Sleep Center
 - Martin General Hospital Sleep Center
 - Universal Sleep Center
 - Wilson Sleep Associates
- Interpreting physician –
 - Sleep Services of America, Lenoir Memorial Hospital.
 - Beaufort Vidant Hospital
 - Sleep Med

Conflict of interest:



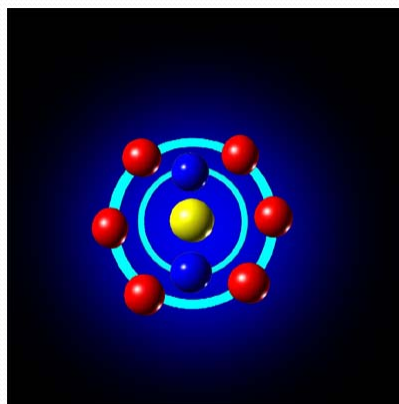
“Insanity is doing the same thing, over and over again, but expecting different results.”



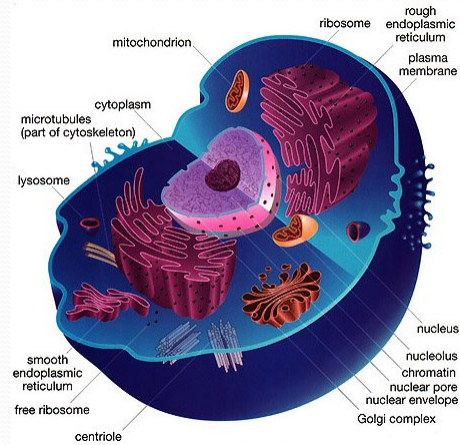
Sometimes one pays most for the things one gets for nothing.

~ Albert Einstein

O 2 = oxygen



Human Cell



Sleep Disordered Breathing in Hospitalized Patients.

51 year old Sergio
admitted with a
hypertensive emergency
and BP 230/120.



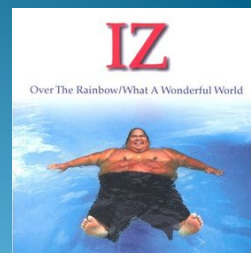
Sleep Disordered Breathing in Hospitalized Patients.

48 year Maria in pre-op
for melanoma



Sleep Disordered Breathing in Hospitalized Patients.

23 year Israel with a BMI
of 55 and cannot loose
weight



Sleep Disordered Breathing in Hospitalized Patients.

88 year old Liz with
acute CHF



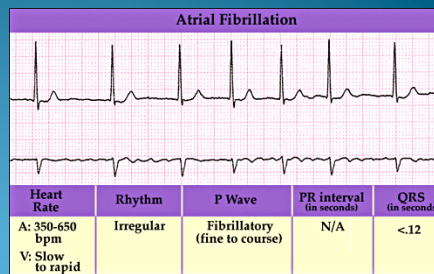
Sleep Disordered Breathing in Hospitalized Patients.

45 year old Robert in the
OR for a pacemaker
insertion



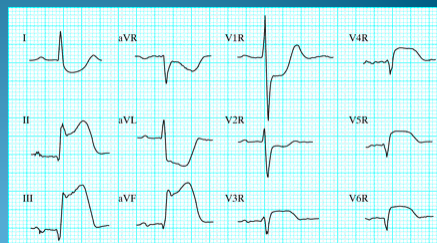
Sleep Disordered Breathing in Hospitalized Patients.

50 year old Tom in the ER
with atrial fibrillation with
RVR.



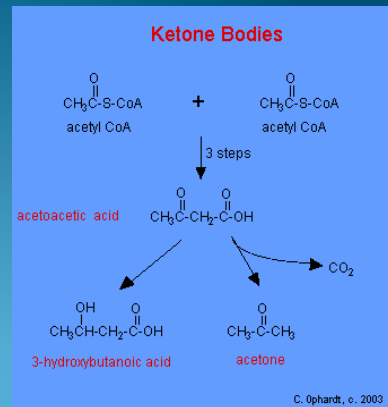
Sleep Disordered Breathing in Hospitalized Patients.

32 year old Rick in the ER
with a STEMI



Sleep Disordered Breathing in Hospitalized Patients.

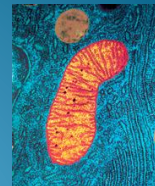
30 year old Mike in the ICU for Diabetic Ketoacidosis.



Sleep Disordered Breathing in Hospitalized Patients.

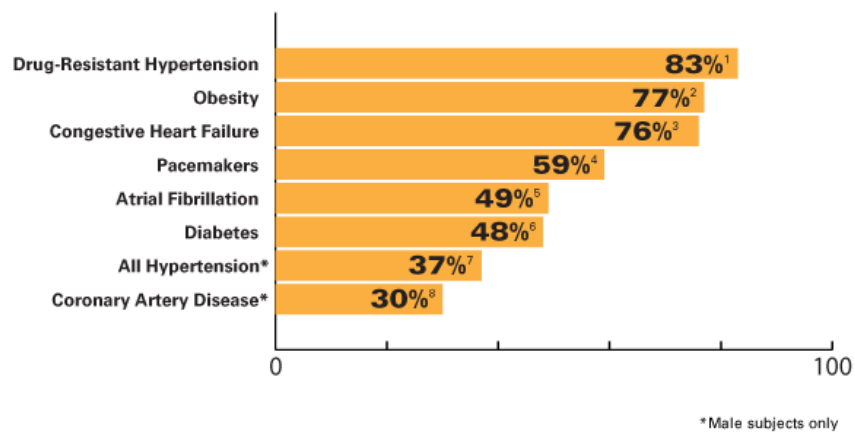
Eighty-one percent of hospital patients are at high risk for obstructive sleep apnea, a Loyola University Health System study has found.

81 %



ScienceDaily. Retrieved August 14, 2012, from <http://www.sciencedaily.com/releases/2010/11/101102083143.htm>

Incidence of SDB



References

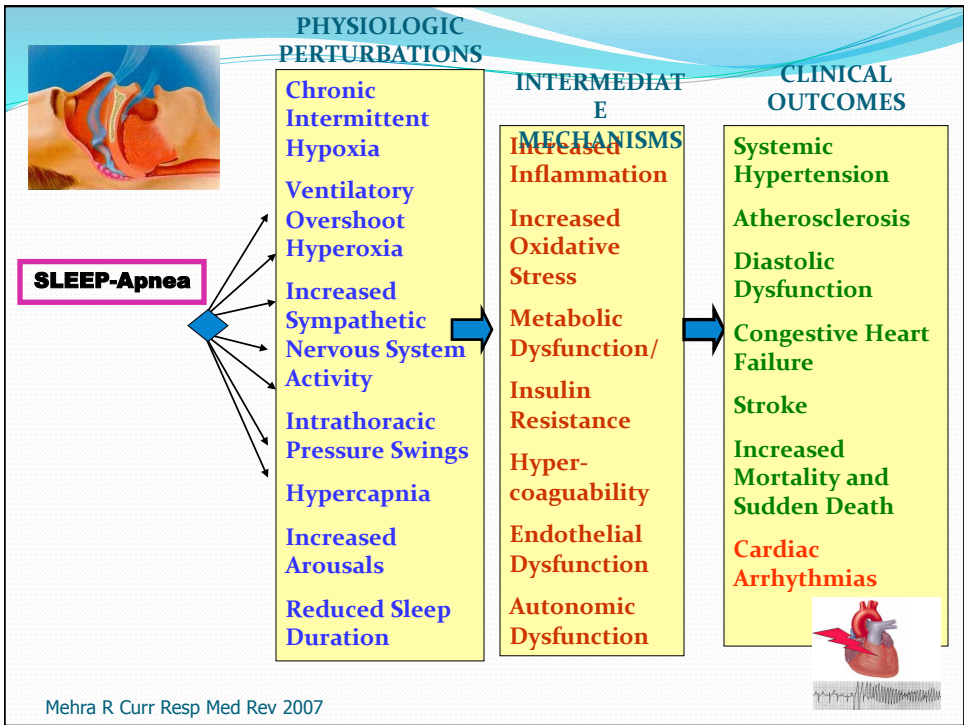
- Logan et al. High prevalence of unrecognized sleep apnoea in drug-resistant hypertension. *J Hypertens* 2001;19:2271-2277
- O'Keeffe & Patterson. Evidence of supporting routine polysomnography before bariatric surgery. *Obes Surg* 2004
- Oldenburg et al. Sleep-disordered breathing in patients with symptomatic heart failure: a contemporary study of prevalence in and characteristics of 700 patients. *Eur J Heart Fail* 2007;9:251-257
- Garrigue et al. High prevalence of sleep apnea syndrome in patients with long-term pacing, the European multicenter polysomnographic study. *Circulation*. 2007;115:1-7
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- Einhorn et al. Prevalence of sleep apnea in population of adults with type 2 diabetes mellitus. *Endocr Pract* 2007;13:355-362
- Sjostrom et al. Prevalence of sleep apnoea and snoring in hypertensive men: a population based study. *Thorax* 2002;57:602-607
- Schafer et al. Obstructive sleep apnea as a risk marker in coronary artery disease. *Cardiology*. 1999;92:79-84

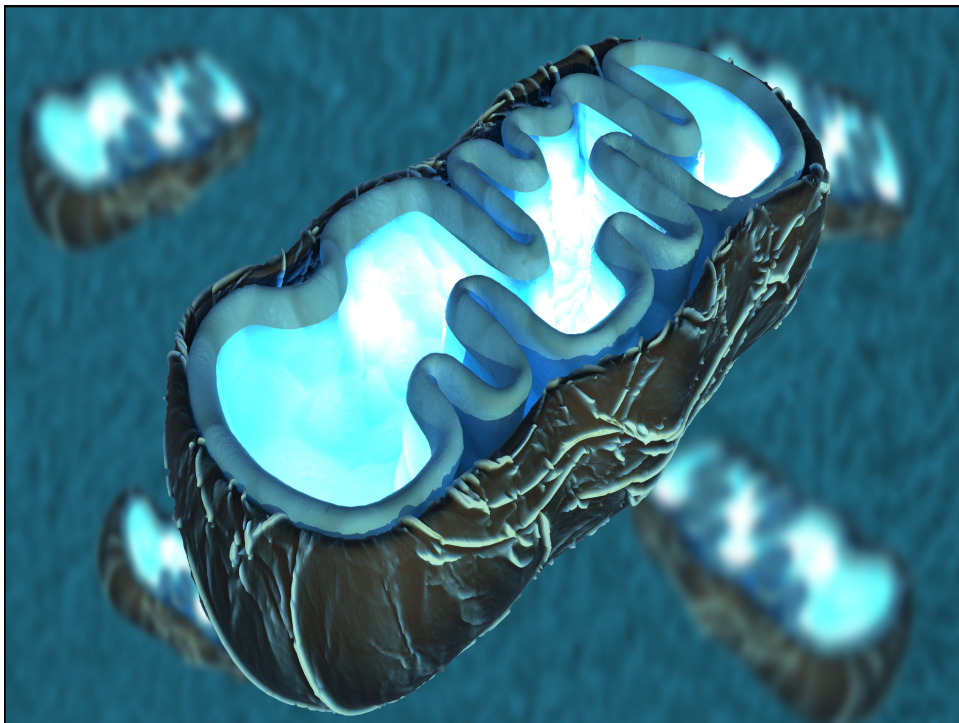
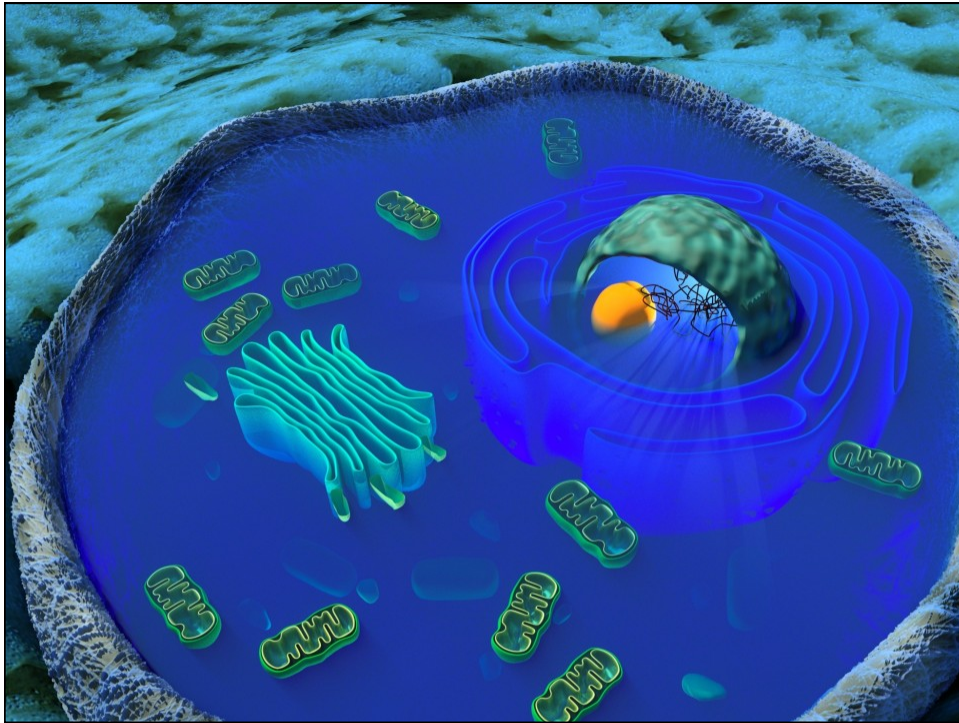
JACC Journals

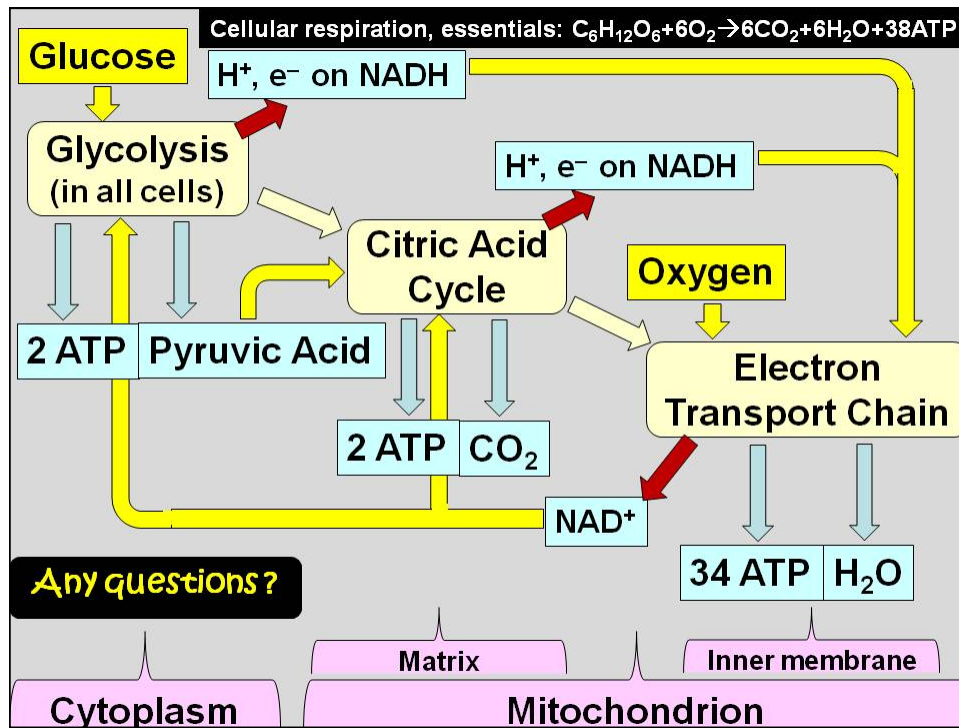
From: Sleep Apnea and Cardiovascular Disease: Title and subTitle BreakAn American Heart Association/
 American College of Cardiology Foundation Scientific Statement From the American Heart Association
 Council for High Blood Pressure Research Professional Education Committee, Council on Clinical
 Cardiology, Stroke Council, and Council on Cardiovascular Nursing In Collaboration With the National
 Heart, Lung, and Blood Institute National Center on Sleep Disorders Research (National Institutes of
 Health)

Figure Legend:
 Partial and complete airway obstruction resulting in hypopnea and apnea, respectively. Reprinted from Hahn PY, Somers VK. Sleep apnea and hypertension. In: Lip GYH, Hall JE, eds. Comprehensive Hypertension. St. Louis, MO: Mosby; 2007:201–207. Copyright Elsevier 2007. Used with permission.

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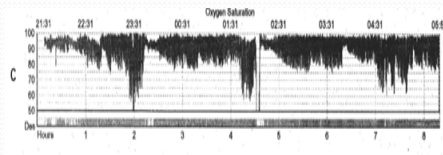






Sleep Apnea and Oxidative Stress

- Recurrent hypoxia and reoxygenation
 - Increase flux of free radicals
 - Induce endothelin expression
 - Suppress NO generation
 - Induce local vasoconstriction and changes in vascular permeability
- Results in oxidative stress causing generation of ROS (superoxide)

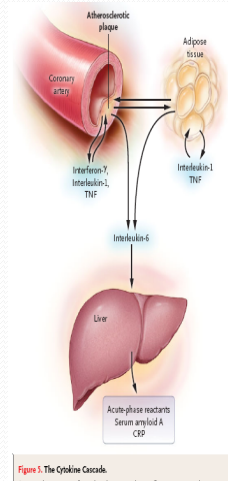


Prabhakar NR, JAP, 2001

Pro-Inflammatory and Atherogenic Effects

- Upregulation of inflammatory mediators
 - IL6, sIL6R, IL-8, TNF α , CRP, (NF-Kappa B)
- Enhanced thrombotic potential
 - PAI-1, P-selectin, fibrinogen,
 - VEGF
- Oxidation of serum proteins and lipids
- Endothelial dysfunction
- Insulin Resistance and Dyslipidemia

Hansson *NEJM* 352: 2005



From: Sleep Apnea and Cardiovascular Disease: Title and subTitle BreakAn American Heart Association/
 American College of Cardiology Foundation Scientific Statement From the American Heart Association
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 Health)

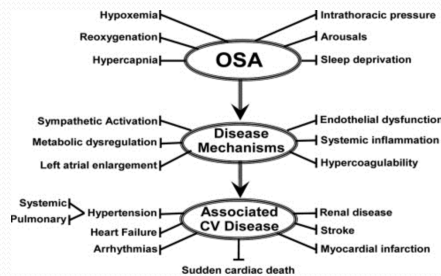
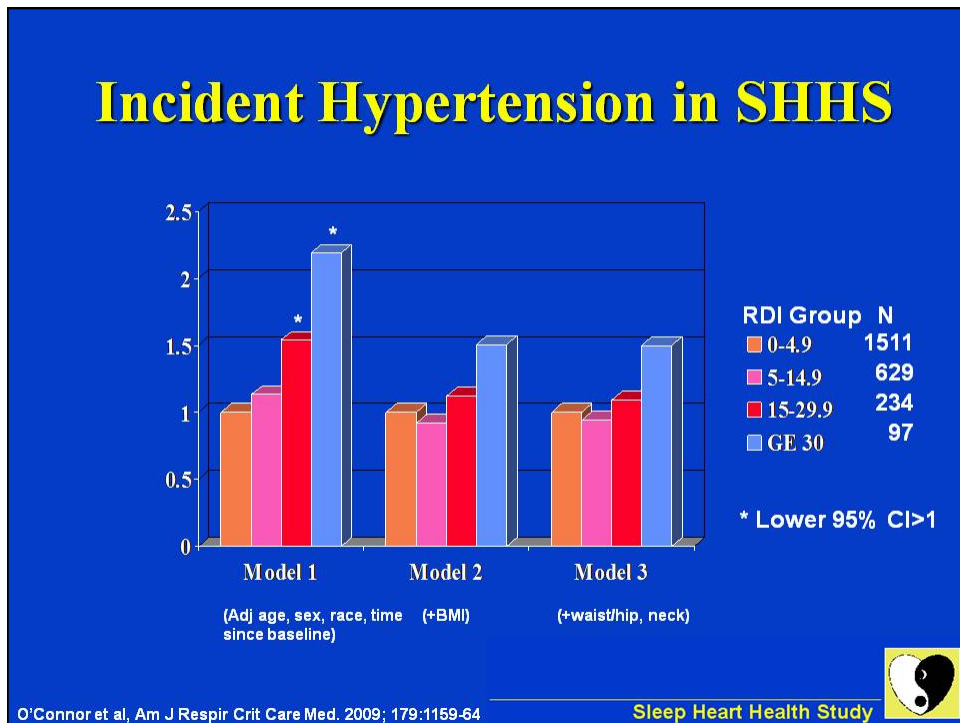
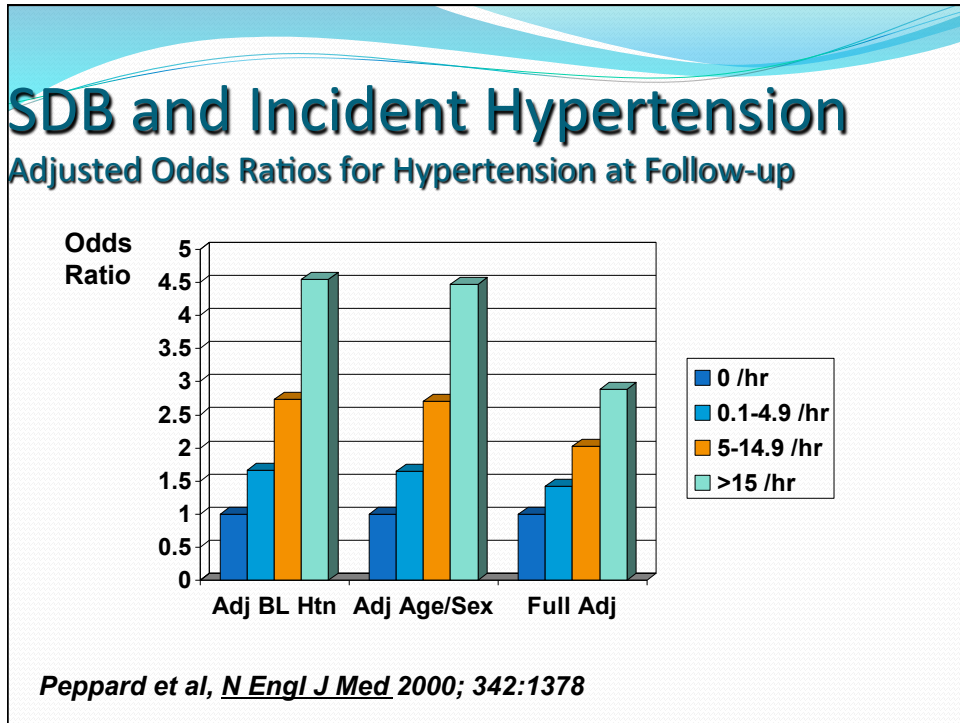


Figure Legend:

Schematic outlining proposed pathophysiological components of OSA, activation of cardiovascular disease mechanisms, and consequent development of established cardiovascular disease.

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Hazard Ratios for Incident CHD Adjusted for age, race, smoking, BMI

AHI	Men		Women	
	All	Age <70	All	Age <70
<5 (ref)	1.00 (referent)	1.00 (referent)	1.00 (referent)	1.00 (referent)
5-<15	0.95 (0.72 - 1.24)	0.96 (0.68 - 1.37)	0.95 (0.68 - 1.33)	0.93 (0.54 - 1.58)
15-<30	1.10 (0.78 - 1.55)	1.07 (0.68 - 1.69)	0.91 (0.55 - 1.52)	0.91 (0.40 - 2.04)
≥30	1.47 (1.01 - 2.14)	1.75 (1.08 - 2.82)	0.45 (0.16 - 1.23)	---
Continuous, 10 events/hr	1.09		0.88	
P value	.03		.11	

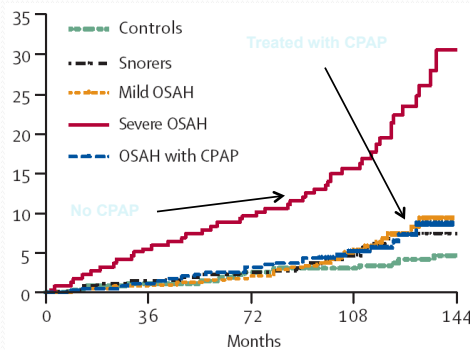
Gottlieb et al, Circulation 2010

Sleep Heart Health Study



Incident CHD and OSA

Although there was an increased risk of incident CHD in clinic-derived samples, those who were treated with CPAP had the same risk as controls



12 year follow-up
All Men
N=1651

Marin, Lancet 2005

Hazard Ratios for Incident CHF Adjusted for age, race, smoking, BMI

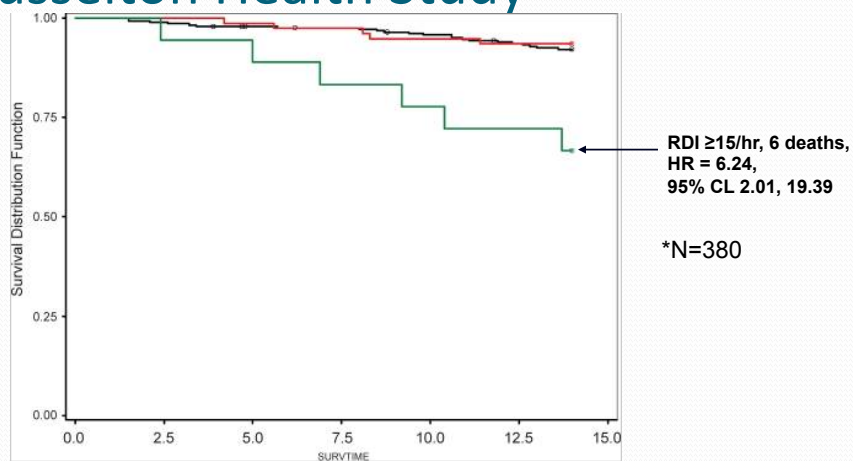
AHI	Men	Women
<5 (ref)	1.00 (referent)	1.00 (referent)
5-<15	1.01 (0.67 - 1.53)	1.05 (0.75 - 1.48)
15-<30	1.21 (0.73 - 2.00)	1.09 (0.67 - 1.79)
≥30	1.71 (1.02 - 2.88)	1.11 (0.55 - 2.25)
Continuous, 10 events/hr	1.13	0.98
P value	<.02	.74

Gottlieb et al, Circulation 2010

Sleep Heart Health Study

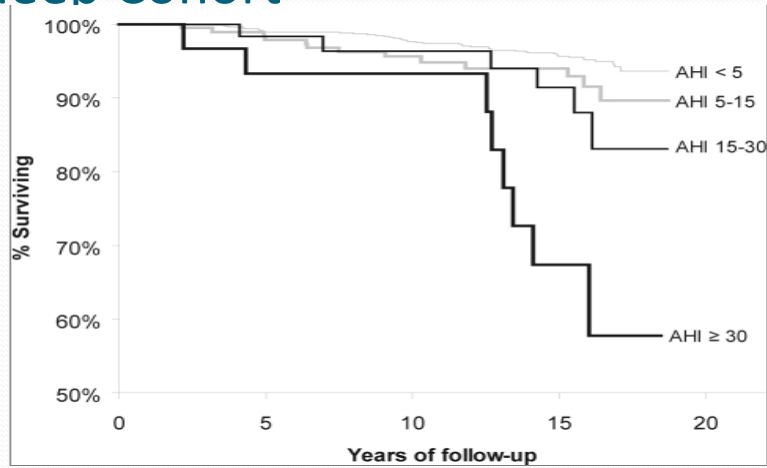


All Cause Mortality: Busselton Health Study*



Marshall et al, Sleep. 2008 August 1; 31(8): 1079-1085

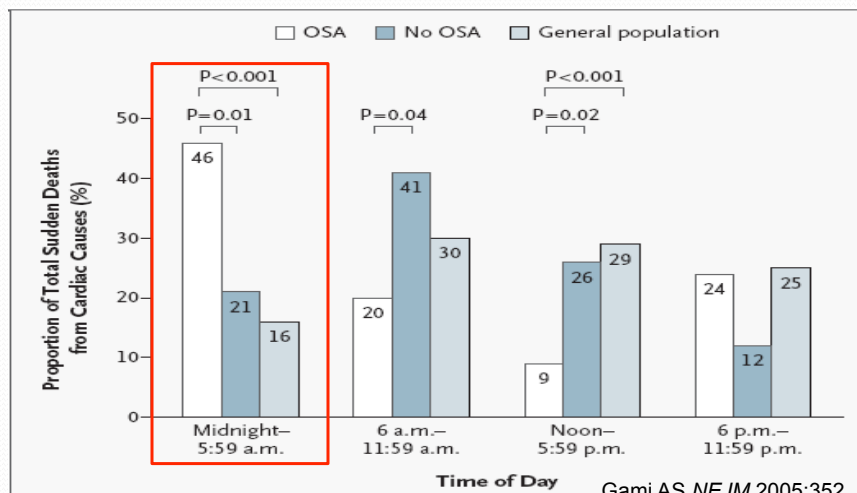
All Cause Mortality: Wisconsin Sleep Cohort*



Young et al, Sleep. 2008 August 1; 31(8): 1071-1078

*N=1496, CPAP Treated Excluded

Nocturnal Predilection for Sudden Cardiac Death in OSA



N=112

Gami AS NEJM 2005:352

Adjusted Odds Ratio of Nocturnal Arrhythmia By Sleep Apnea (AHI>30) In SHHS

	Adjusted OR	95% CI
Atrial Fibrillation	4.5	1.2, 17
CVE or NSVT	1.8	1.2, 2.8
AF or NSVT	3.7	1.7, 8.0

Odds > 7.0 for those 50 to 60 years old

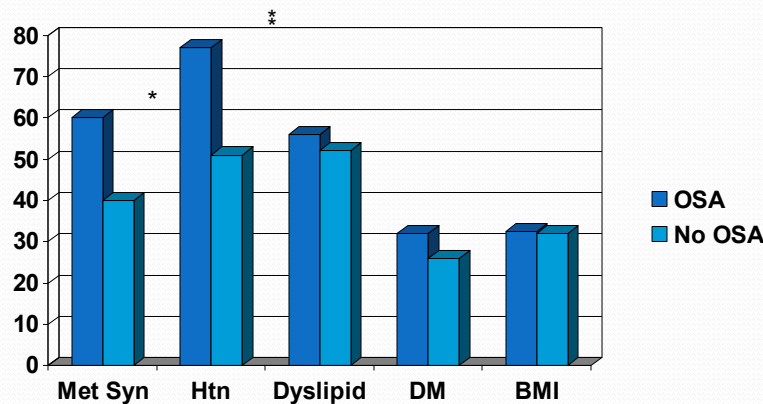
Mehra R AJRCCM 2006

Case-Cross-Over Study: Relative Risk of a Paroxysmal Arrhythmia

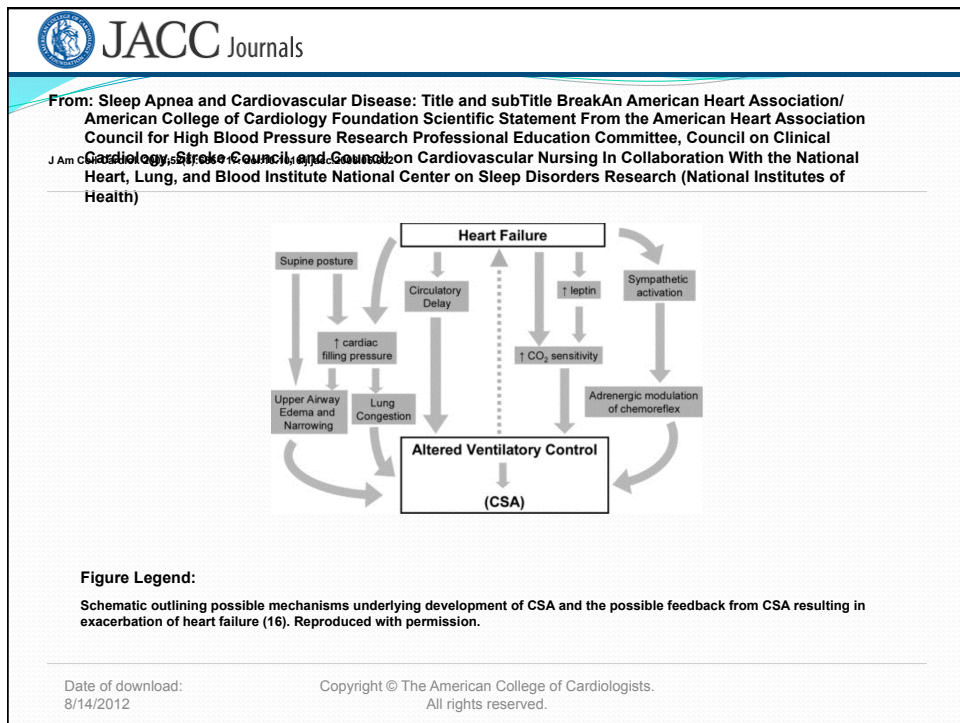
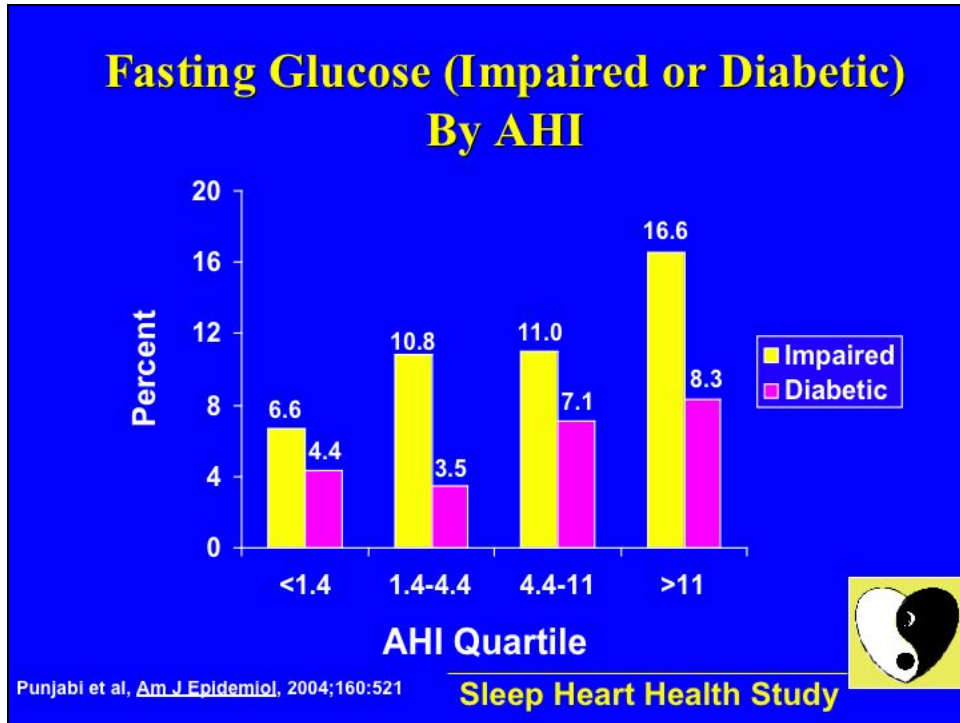
*Occurring After an Apnea/Hyponea: **17***

Monahan JAAC 2008

Prevalence of Metabolic Syndrome in OSA vs non OSA Patients

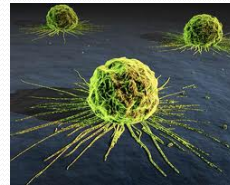


Parish et al, J Clin Sleep Med 2007;3: 467-472



Sleep Apnea and Cancer

- 67 % greater incidence of cancer in severe OSA patients.
- 5 times greater mortality from cancer in OSA patients.



1. Spanish Sleep Network. 2. Dr. F. Javier Nieto, chair of the Department of Population Health Sciences at the University of Wisconsin School of Medicine and Public Health.

Sleep Apnea and Cancer

- "These findings provide clues to help further our understanding of the relationship between sleep and health ... It will be important to understand the relationship and mechanisms, if the association is confirmed."

Dr. F. Javier Nieto, chair of the Department of Population Health Sciences at the University of Wisconsin School of Medicine and Public Health

Next step ?

- Develop protocols for identifying patients at risk.
- Arrange for screening, testing and post hospital follow up.
- Refer to the sleep clinic for follow up.

The STOP-BANG questionnaire consists of eight questions:

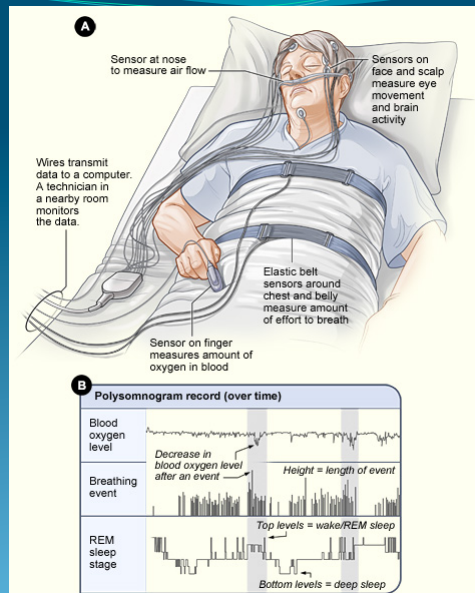
1. Do you Snore loudly?
2. Are you Tired or sleepy during the day?
3. Has anyone Observed you stop breathing during sleep?
4. Do you have high blood Pressure?
5. Do you have a Body mass index higher than 35. (Depending on height, this means being roughly 65 or 70 pounds or more overweight).
6. Is your Age older than 50?
7. Do you have a Neck circumference greater than 40 cm. (15.7 in.)?
8. Is your Gender male?

A score of 3 or more yes answers is considered a high risk for obstructive sleep apnea.

In hospital testing



Follow Up



Synopsys...

- 1) Identifying who is at risk ?
- 2) Brief Review of SDB ?
- 4) Treatment plan ?

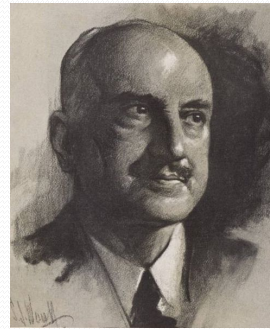
Oxygen

- ... in case of a sudden loss of cabin pressure, oxygen masks would drop from the ceiling. Put your mask on first before helping others...



Please remember...

- Those who cannot remember the past are condemned to repeat it –George Santayana



Questions ?

