I SESSIONE

Moderatori: Pio Caso (Napoli), Gennaro Mazzarella (Napoli)

10.15 Epidemiologia della sleep apnea
Fortunato Arenga (Napoli)

10.35 Perché è importante studiare la sleep apnea in cardiologia
Gerardo Nigro (Napoli)

10.55 Apnee ostruttive ed apnee centrali: meccanismi patogenetici e fattori predittivi
Alessandro Saglia (Napoli)

11.15 Fibrillazione atriale e apnee notturne
Giuseppe Palmiero (Napoli)

11.35 Coffee Break

II SESSIONE

Moderatori: Andrea Bianco (Napoli), Paolo Golino (Napoli)

11.45 Sleep Apnea: il ruolo dell'Otorinolaringoiatra
Carlo Antonio Leone (Napoli)

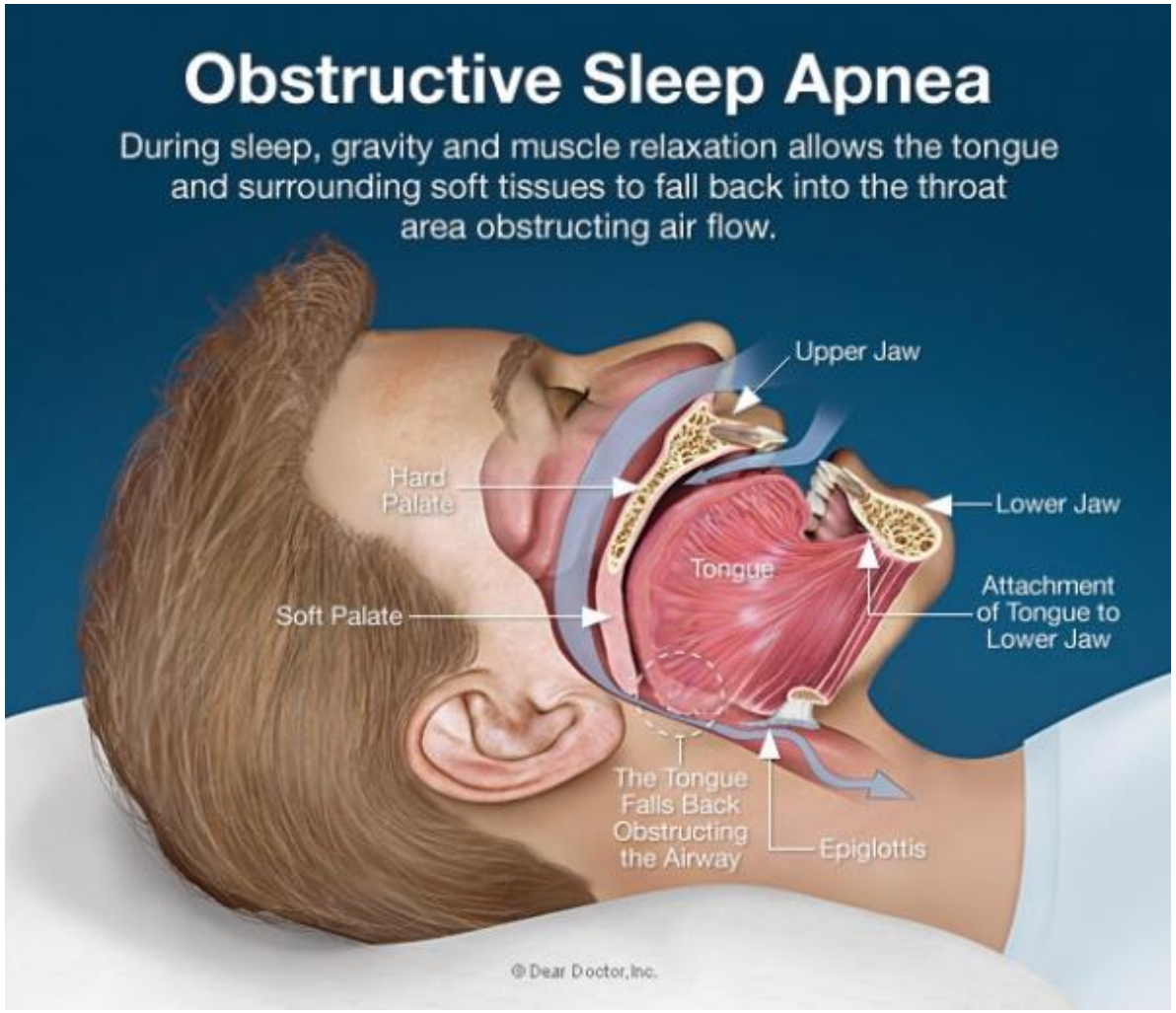
12.05 Scompenso cardiaco ed apnee notturne
Fulvio Cacciapuoti (Napoli)

12.25 Aritmie ventricolari ed apnee notturne
Antonio Rapacciuolo (Napoli)

12.45 Device impiantabili ed apnee notturne: solo diagnosi o anche parte della terapia
Mario Volpicelli (Napoli)


RAI

Epidemiology



OSAS IS HIGHLY PREVALENT IN GENERAL POPULATION:

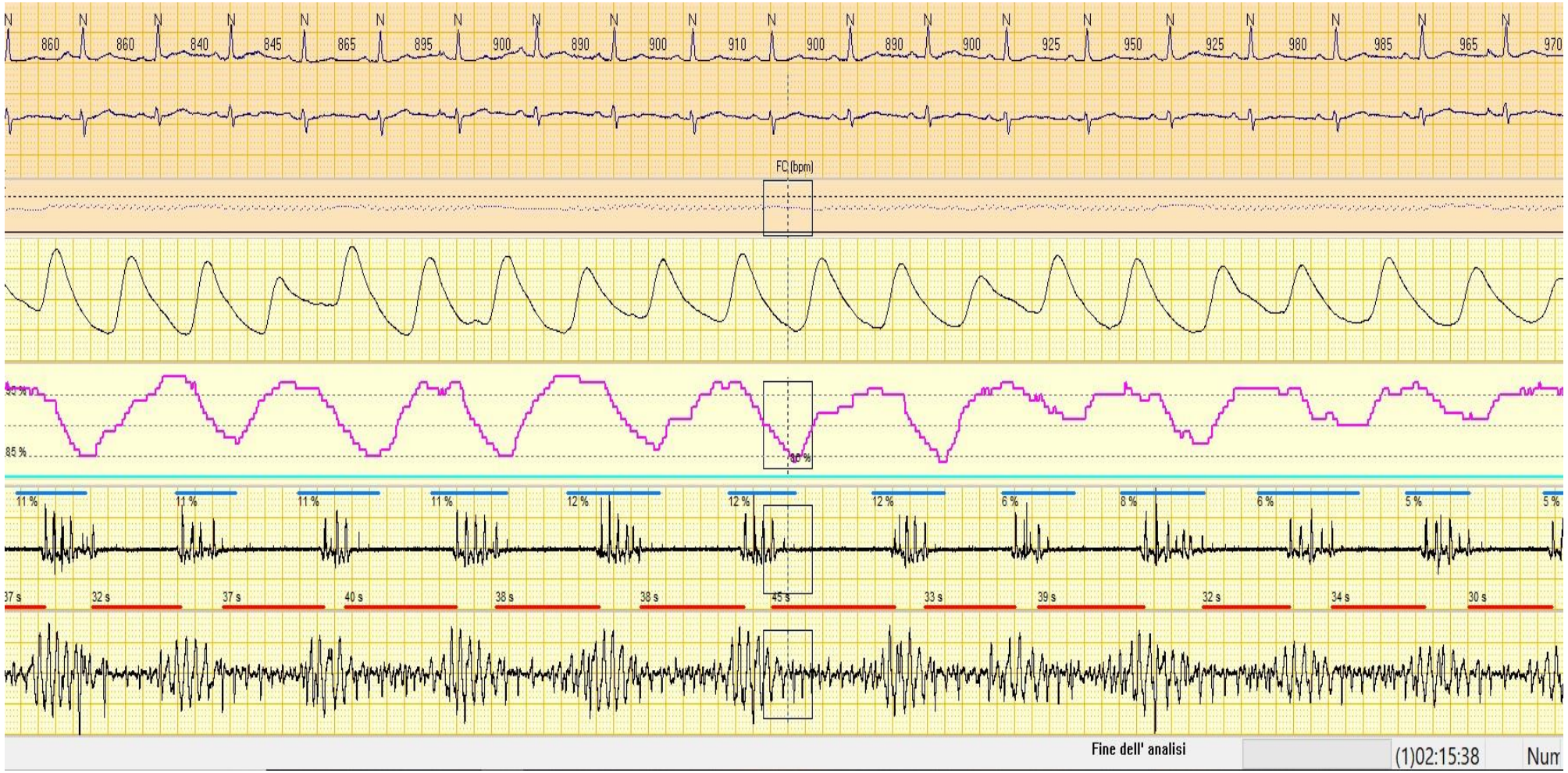
- **MEN 34%**
- **WOMEN 17%**

PATIENTS WITH CVD: 40-60%

BIDIRECTIONAL RELATIONSHIP OF SLEEP APNEA AND CARDIOVASCULAR DISORDERS

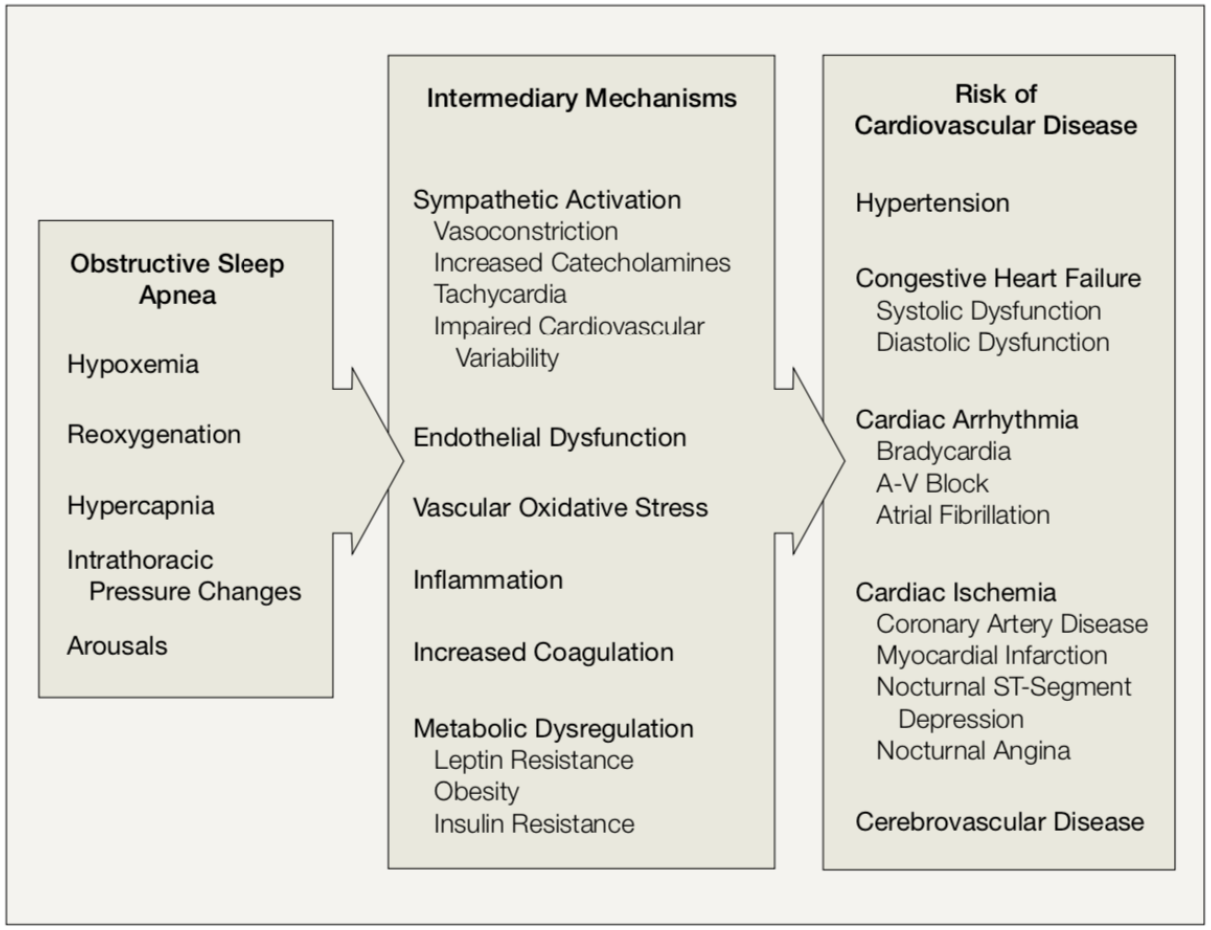
Obstructive Sleep Apnea in Cardiovascular Disease: A Review of the Literature and Proposed Multidisciplinary Clinical Management Strategy, Jeremy R. Tietjens et al.

Definition



VK Somers, ME Dyken, MP Clary and FM Abboud

Pathophysiology



Abnormalities associated with obstructive sleep apnea may be intermediary mechanisms that contribute to the initiation and progression of cardiac and vascular pathology. These mechanisms may interact with each other, thus potentiating their pathophysiological implications.

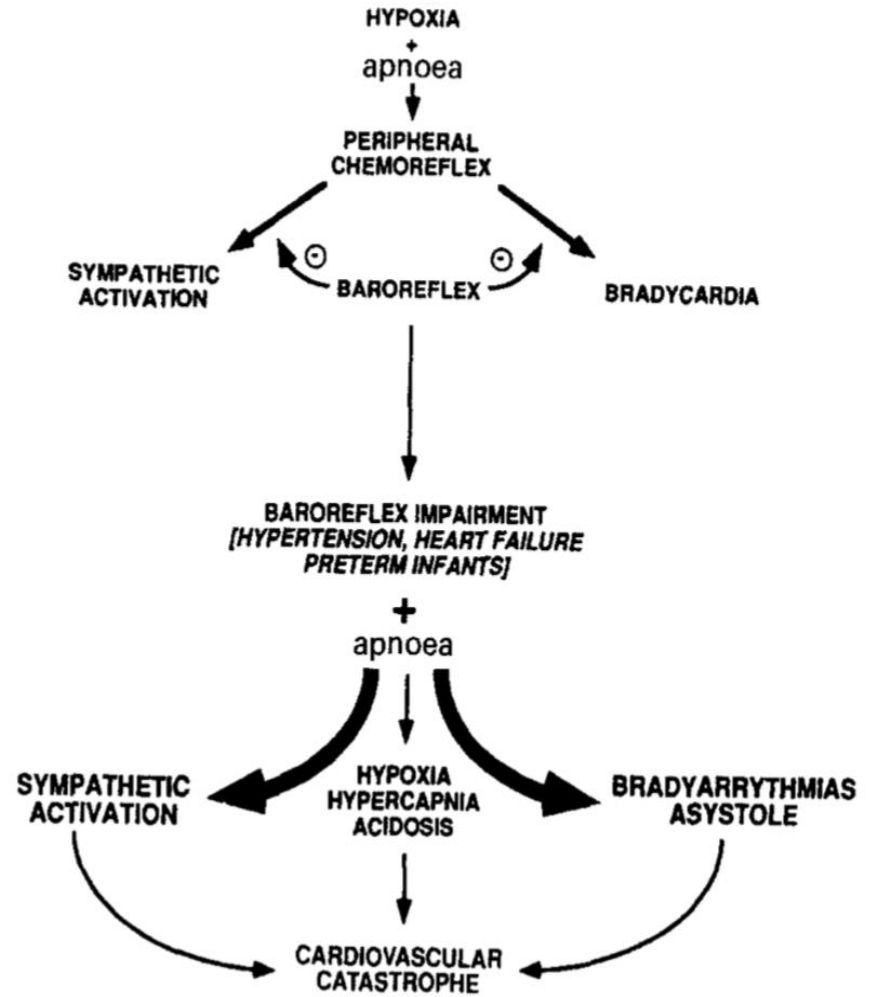


FIG. 8. Flow diagram indicating a possible role for baroreflex impairment resulting in uninhibited and excessive chemoreflex mediated vagal and sympathetic discharge in response to apnoeic episodes in neonates and in patients with hypertension (who are at increased risk for sleep apnoea) and in patients with heart failure.

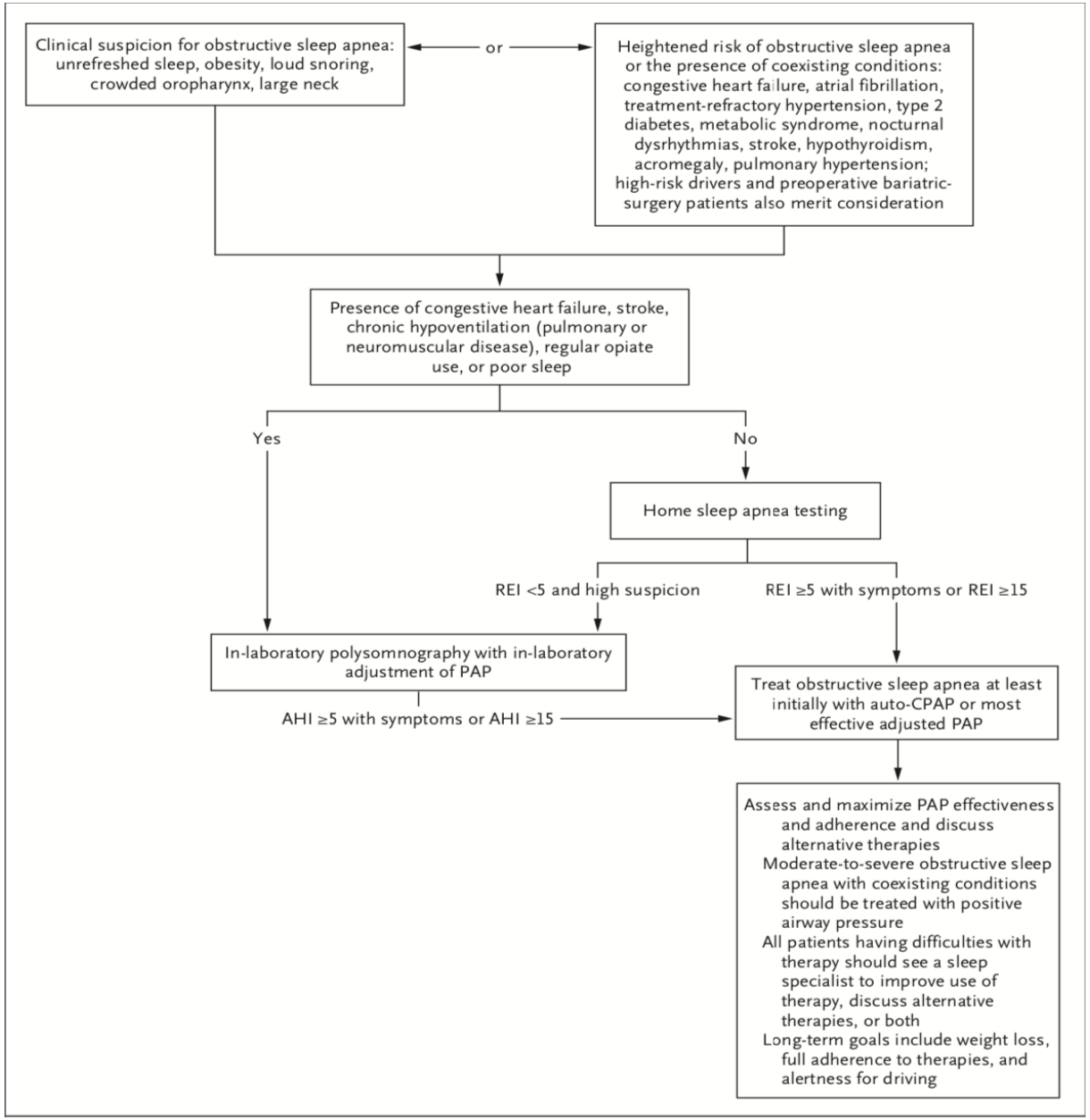
Obstructive sleep apnea: implications for cardiac and vascular disease, Shamsuzzaman AS et al.

Diagnosis

Signs and Symptoms of Obstructive Sleep Apnea

Snoring
Witnessed apneas by sleep partner
Episodes of gasping or choking during sleep
Insomnia with repeated awakenings
Excessive daytime sleepiness
Nonrefreshing sleep
Morning headaches
Difficulty concentrating
Memory impairment
Irritability and/or mood changes
Nocturia
Decreased libido and/or erectile dysfunction

Obstructive Sleep Apnea in Cardiovascular Disease: A Review of the Literature and Proposed Multidisciplinary Clinical Management Strategy, Jeremy R. Tietjens et al.

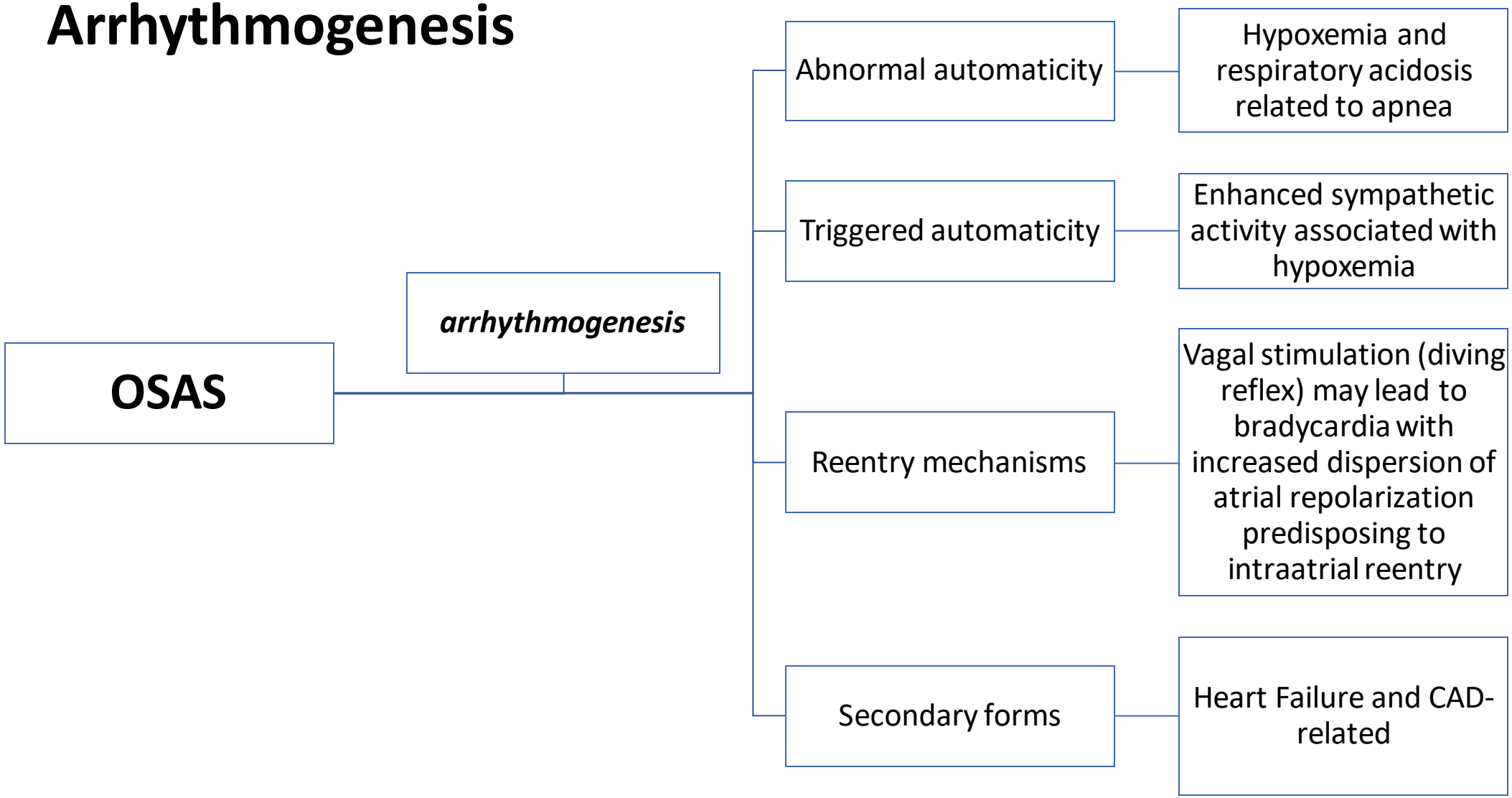


Obstructive Sleep Apnea in Adults, Sigrid C. Veasey et al.

Associated CV disorders

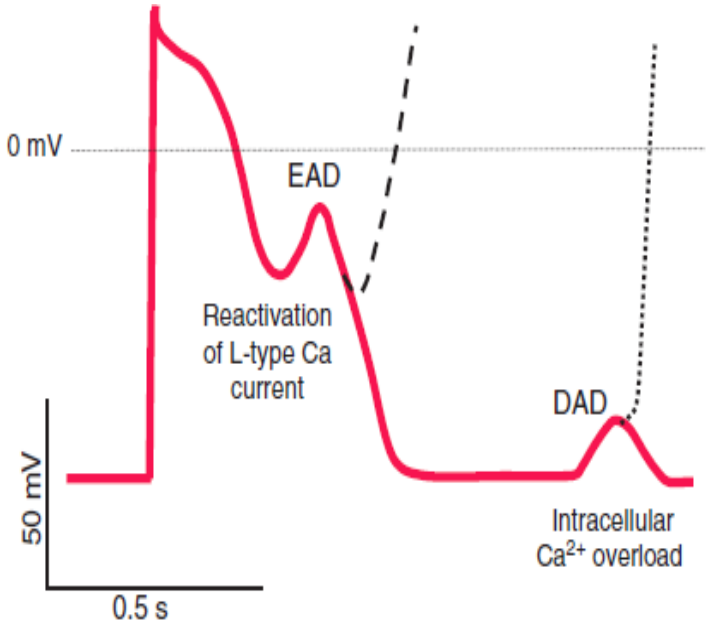
- Endothelial dysfunction
- Hypertension
- Pulmonary hypertension
- Systolic or diastolic heart failure
- ***ARRHYTHMIAS***
- Coronary artery disease
- TIA and stroke
- Dementia
- Sudden Cardiac Death

Arrhythmogenesis



Association of Nocturnal Arrhythmias with Sleep-disordered Breathing, The Sleep Heart Health Study, Reena Mehra et al

Arrhythmogenesis



Source: J.L. Jameson, A.S. Fauci, D.L. Kasper, S.L. Hauser, D.L. Longo, J. Loscalzo: Harrison's Principles of Internal Medicine, 20th Edition

Association of Nocturnal Arrhythmias with Sleep-disordered Breathing

The Sleep Heart Health Study

Reena Mehra, Emelia J. Benjamin, Eyal Shahar, Daniel J. Gottlieb, Rawan Jayakumar Sahadevan, and Susan Redline

Among subjects with severe SDB compared with subjects without SDB, there was a significant increase in the prevalence of atrial fibrillation, non-sustained ventricular tachycardia and complex ventricular ectopy.

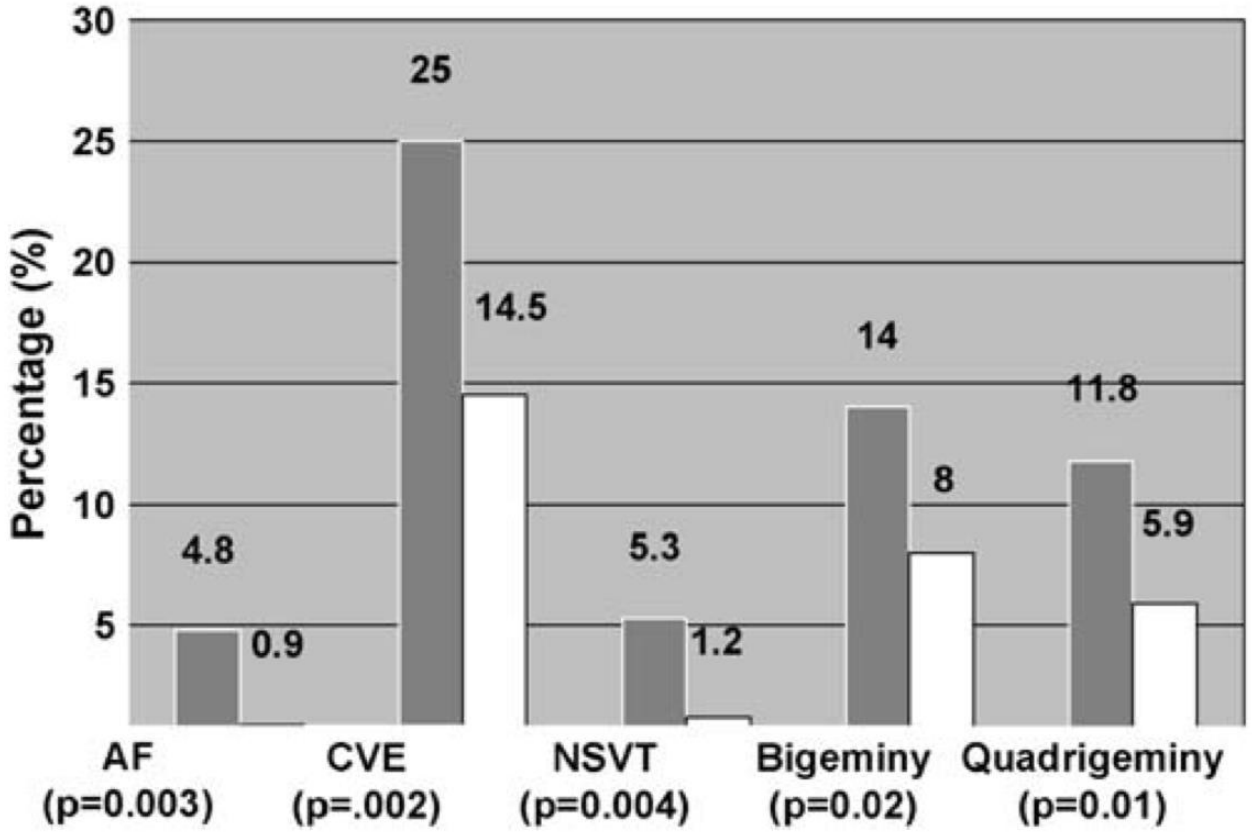


Figure 1. Arrhythmia prevalence (%) according to sleep-disordered breathing (SDB) status. *Shaded bars*, SDB; *open bars*, non-SDB. AF, atrial fibrillation; CVE, complex ventricular ectopy; NSVT, nonsustained ventricular tachycardia. n = 228 with SDB and n = 338 without SDB.

OSAS ed Aritmie Ventricolari

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Day–Night Pattern of Sudden Death in Obstructive Sleep Apnea

Apoor S. Gami, M.D., Daniel E. Howard, B.S., Eric J. Olson, M.D., and Virend K. Somers, M.D., Ph.D.

N Engl J Med. 2005 Mar 24;352(12):1206-14

The risk of sudden cardiac death (SCD) in the general population peaks from 6 am to noon and has a nadir from midnight to 6 am.
People with OSA have a peak in SCD during the sleeping hours.

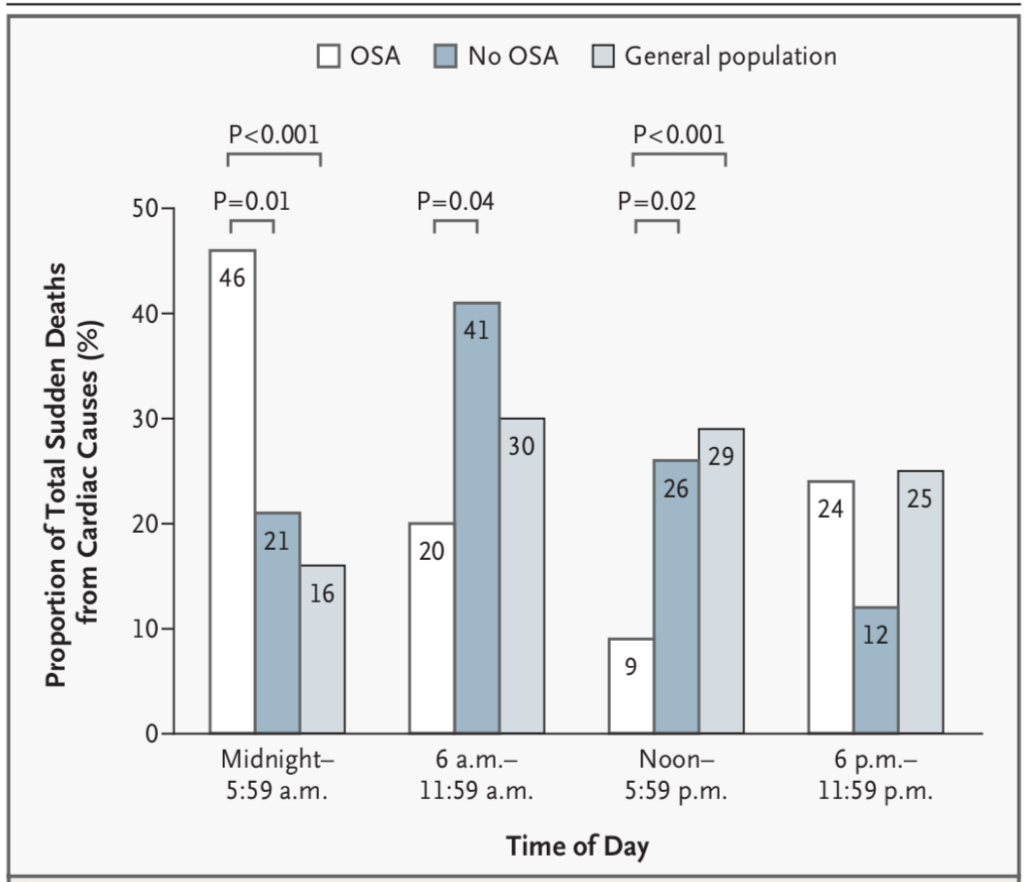


Figure 1. Day–Night Pattern of Sudden Death from Cardiac Causes in 78 Persons with and 34 Persons without Obstructive Sleep Apnea (OSA) and in the General Population.

Data for the general population were derived from Cohen et al.[1]

Heart Failure-related arrhythmias

Effects of Continuous Positive Airway Pressure on Sleep Apnea and Ventricular Irritability in Patients With Heart Failure

S. Javaheri, MD

Circulation. 2000 Feb 1;101(4):392-7

In **29** patients with stable HFrEF and with SDB (**8** with OSA and **21** with CSA), **55%** (16 of 29 patients) responded significantly to CPAP:

- AHI, arousal index, and arterial oxyhemoglobin saturation improved;
- Ventricular arrhythmias also improved in patients whose responded to CPAP;
- there was no significant change in nonresponders.

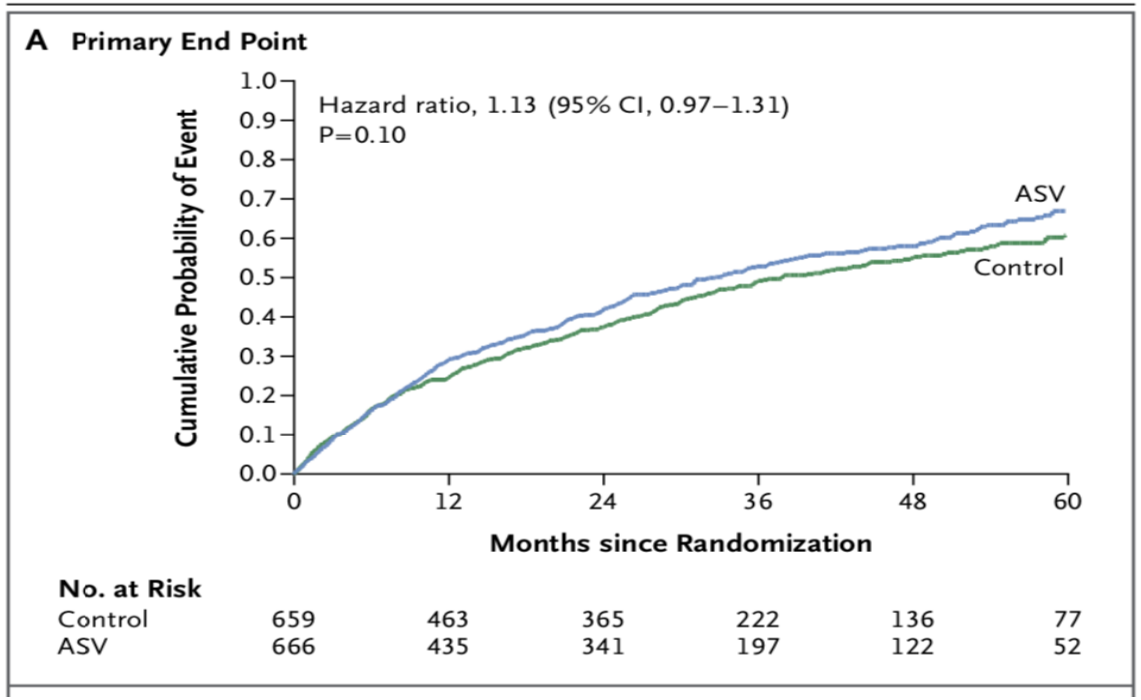
TABLE 2. Effects of CPAP on Ventricular Arrhythmias, Arousals, and Oxyhemoglobin Saturation During Sleep in Heart Failure Patients With Sleep Apnea

	CPAP-Nonresponsive			CPAP-Responsive		
	Baseline	CPAP	*P*	Baseline	CPAP	*P*
PVCs, n/h	223±357	192±321	0.1	66±117	18±20	0.054
Couplets, n/hr	4.7±9	5±8	0.2	3.2±6	0.2±0.2	0.031
VT, n/hr	0.4±1	0.9±2	0.3	1.1±3.2	0.05±0.1	1.0
Baseline SaO_2	96±1	95±3	0.5	95±2	97±1	0.016
Lowest SaO_2, %	74±12	86±6	0.04	79±5	91±3	0.008
SaO_2<90%, %TST	31±17	12±17	0.2	10±9	0.06±0.2	0.008
ArI, n/hr	31±25	36±31	0.5	19±13	9±6	0.023

PVCs indicates premature ventricular contractions; VT, ventricular tachycardias; SaO_2, saturation measured by pulse oximetry; TST, total sleep time; ArI, arousal index. Two patients in the CPAP-responsive group had OSA, and the remaining patients had CSA; n=8 in each group. Values are mean±SD.

Heart Failure-related arrhythmias

- Patients with HF have persistent central apneas despite therapy with CPAP. **Adaptive servoventilation (ASV)** is a form of bi-level positive airway pressure therapy in which the degree of pressure support varies between respiratory cycles in order to maintain stable minute ventilation (useful for Cheyne-Stokes breathing).



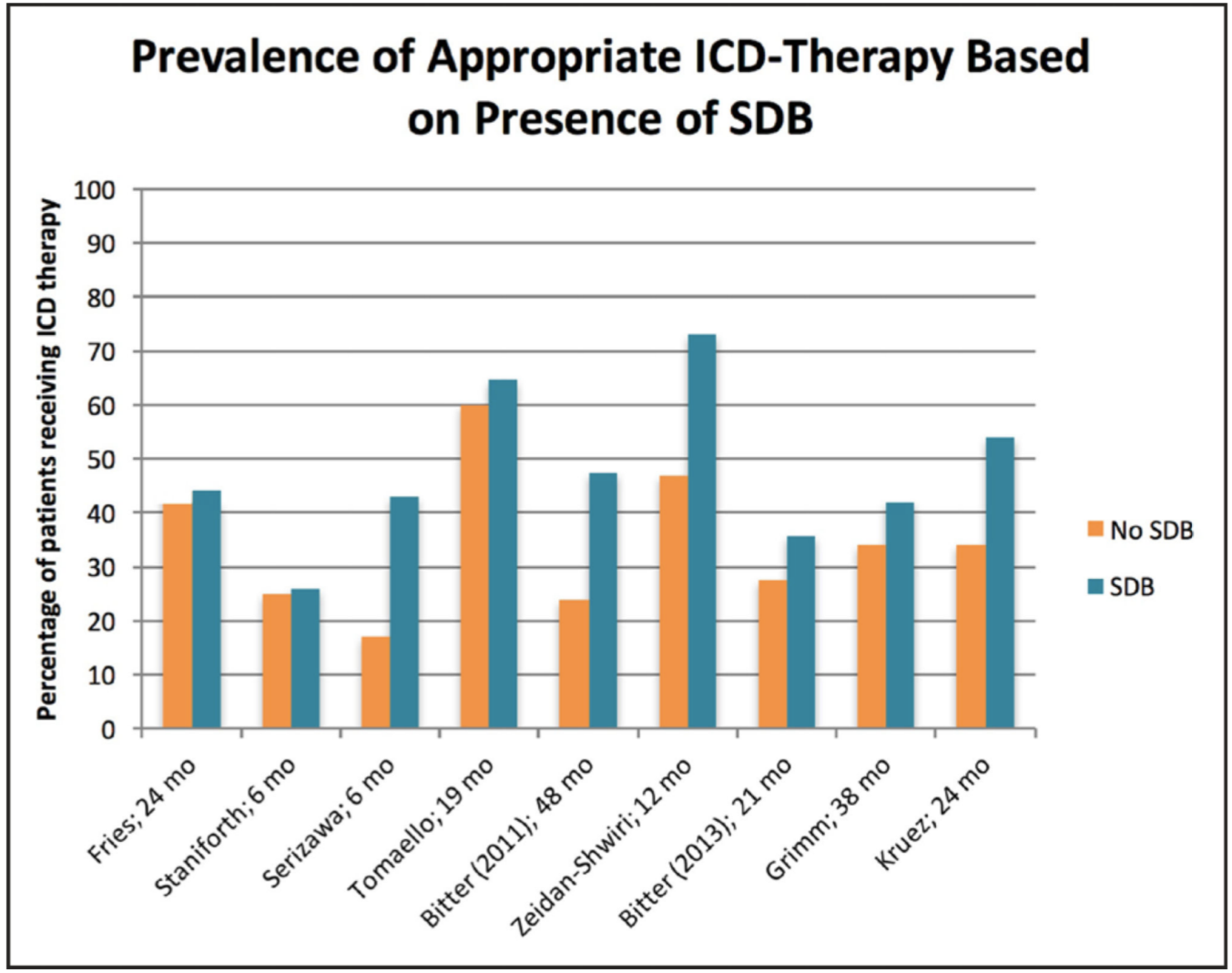
Adaptive servo-ventilation had no significant effect on the primary end point (composite of death from anty cause,lifesaving cardiovascular intervention) in HF patients and predominantly central sleep apnea, but all-cause and cardiovascular mortality were both increased with this therapy.

Heart Failure-related arrhythmias

- Major public health issue and high mortality and morbidity;
- High economic impact
- Sleep disordered breathing (SDB) are the most common, least recognized co-morbidity: 50-70% of HF patients have OSA/CSA (central sleep apnea);
- PAP (positive airway pressure) improves symptoms and probably mortality rate in patients with prevalent OSA.

Prognosis of patients with heart failure and obstructive sleep apnea treated with continuous positive airway pressure. Kasai T
A high prevalence of sleep disordered breathing in men with mild symptomatic chronic heart failure due to left ventricular systolic dysfunction. *Eur J Heart Fail* 2007;**9**:243–250, Vazir A et al.

Heart Failure-related arrhythmias



This meta-analysis showed that, in patients with HF and reduced ejection fraction, the risk of appropriate ICD therapy (a surrogate for malignant ventricular arrhythmia) is higher among patients with SDB compared with those without.

Effect of Sleep-Disordered Breathing on Appropriate Implantable Cardioverter-defibrillator Therapy in Patients With Heart Failure, A Systematic Review and Meta-Analysis, Younghoon Kwon et al.

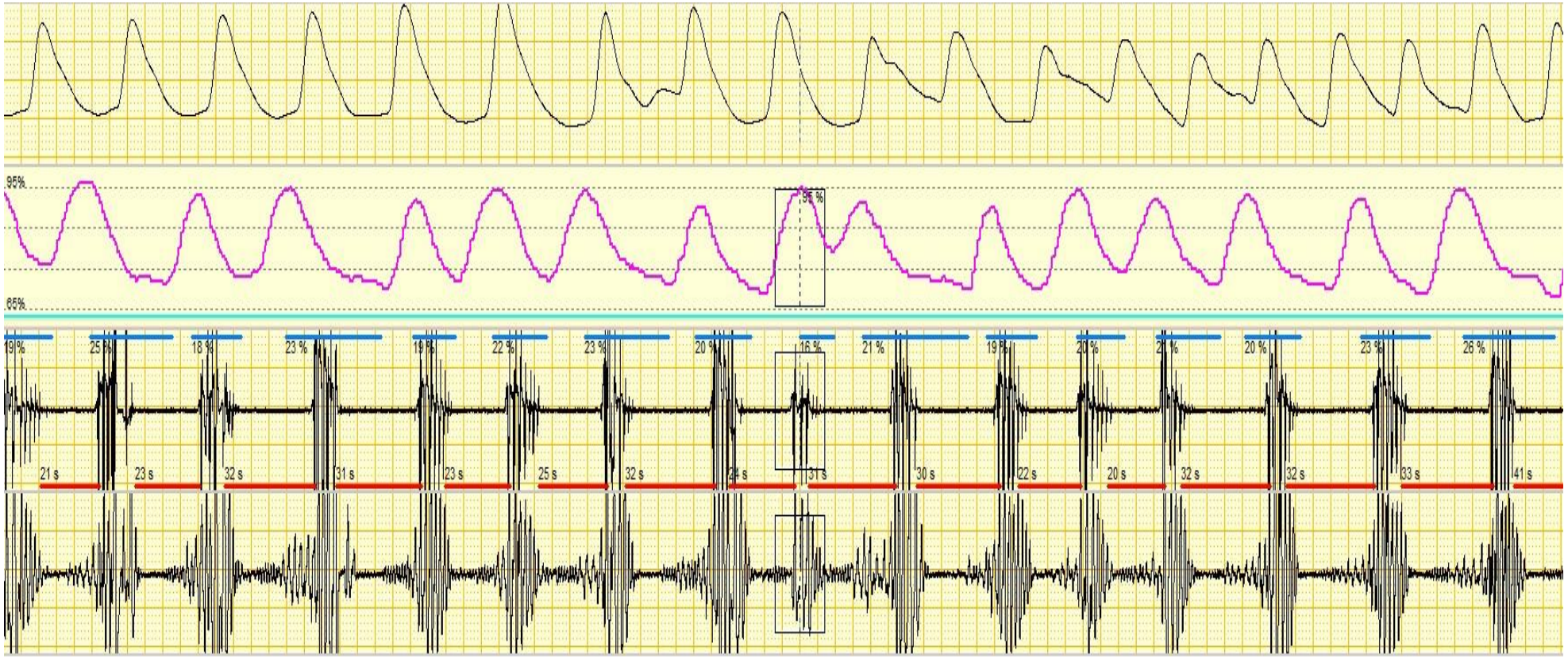
Coronary artery disease-related arrhythmias

- CAD estimated to be present in 40-60% of OSA patients;
- Major cardiac events are more likely in patients with severe OSA;
- AHI severity is an independent predictor of mortality in patients with CAD;
- CPAP may significantly reduce c-v events, also arrhythmias.

Obstructive Sleep Apnea in Cardiovascular Disease: A Review of the Literature and Proposed Multidisciplinary Clinical Management Strategy, Jeremy R. Tietjens et al.

Coronary artery disease

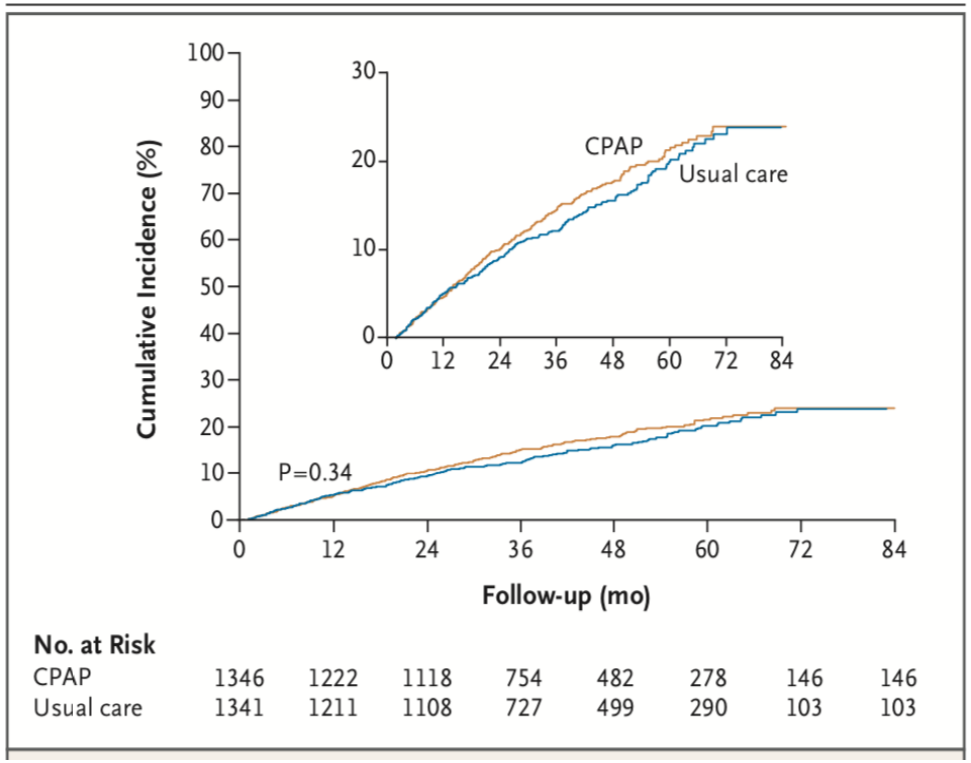
- In our center, 5 of 9 patients with anterior STEMI (culprit lesion in left anterior descending artery) showed OSAS in the first days after the index event.



Obstructive Sleep Apnea in Cardiovascular Disease: A Review of the Literature and Proposed Multidisciplinary Clinical Management Strategy, Jeremy R. Tietjens et al.

Coronary artery disease-related arrhythmias

- CPAP significantly reduces symptoms, but the effects on mortality are uncertain.



In patients with moderate-to-severe OSA and either CAD or cerebrovascular disease, cumulative incidence of a first primary end point (composite of death from cardiovascular causes, myocardial infarction, stroke, or hospitalization fo heart failure, unstable angina or transient ischemic attack) shows no difference between the group that received CPAP plus usual care and group that received usual care alone.

CPAP for Prevention of Cardiovascular Events in Obstructive Sleep Apnea. R. Doug McEvoy et al. N Engl J Med. 2016 Sep 8;375(10):919-31

Conclusion

- OSA has a significantly increased risk of SCD, non-sustained ventricular tachycardia and complex ventricular ectopy.
- There are limited data suggesting a beneficial effect of CPAP therapy on reducing rhythm disturbances in patients with SDB, based on small size and predominantly observational trials.
- Management of SDB in HF patients is not clear: they have more malignant ventricular arrhythmias but they may not improve their mortality with PAP or ASV if CSA is copresent.