14 edició

Jornada Sociosanitària

Trastorns del son en les persones grans

13 de novembre 2019

FUNDACIÓ MUTUAMCONVIURE

# Una visió transversal dels trastorns del son en les persones grans

## Trastorns del son en relació a les alteracions del ritme i la mort sobtada

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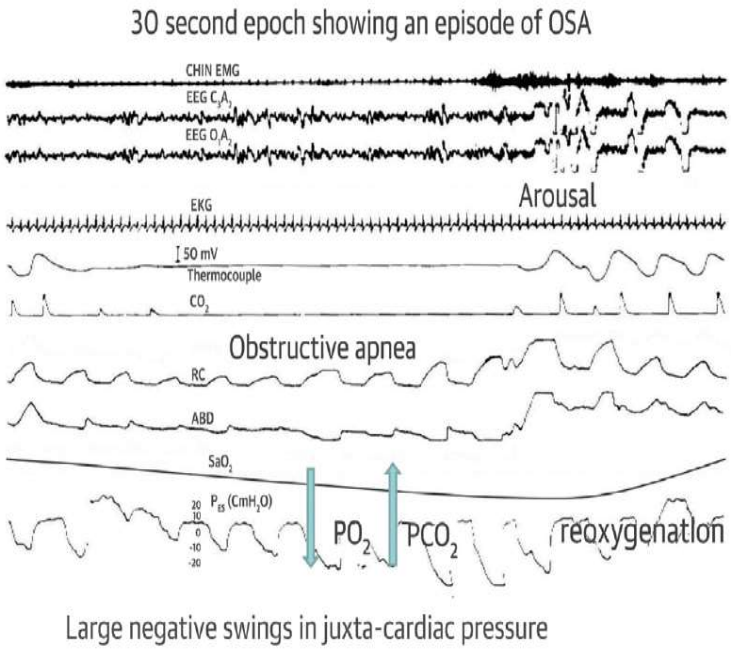
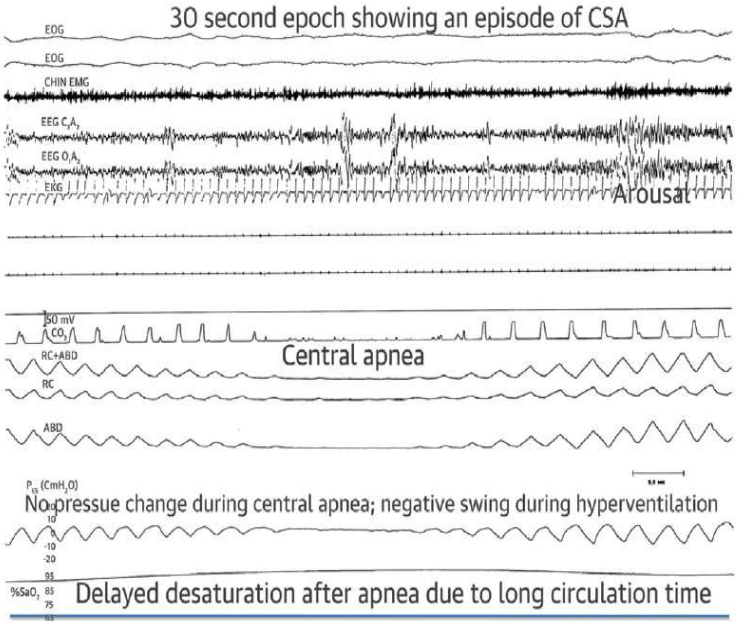
Hospital Moisés Broggi - CSI

Conflictes d’interessos: cap

# TRASTORNS DEL SON EN LES PERSONES GRANS



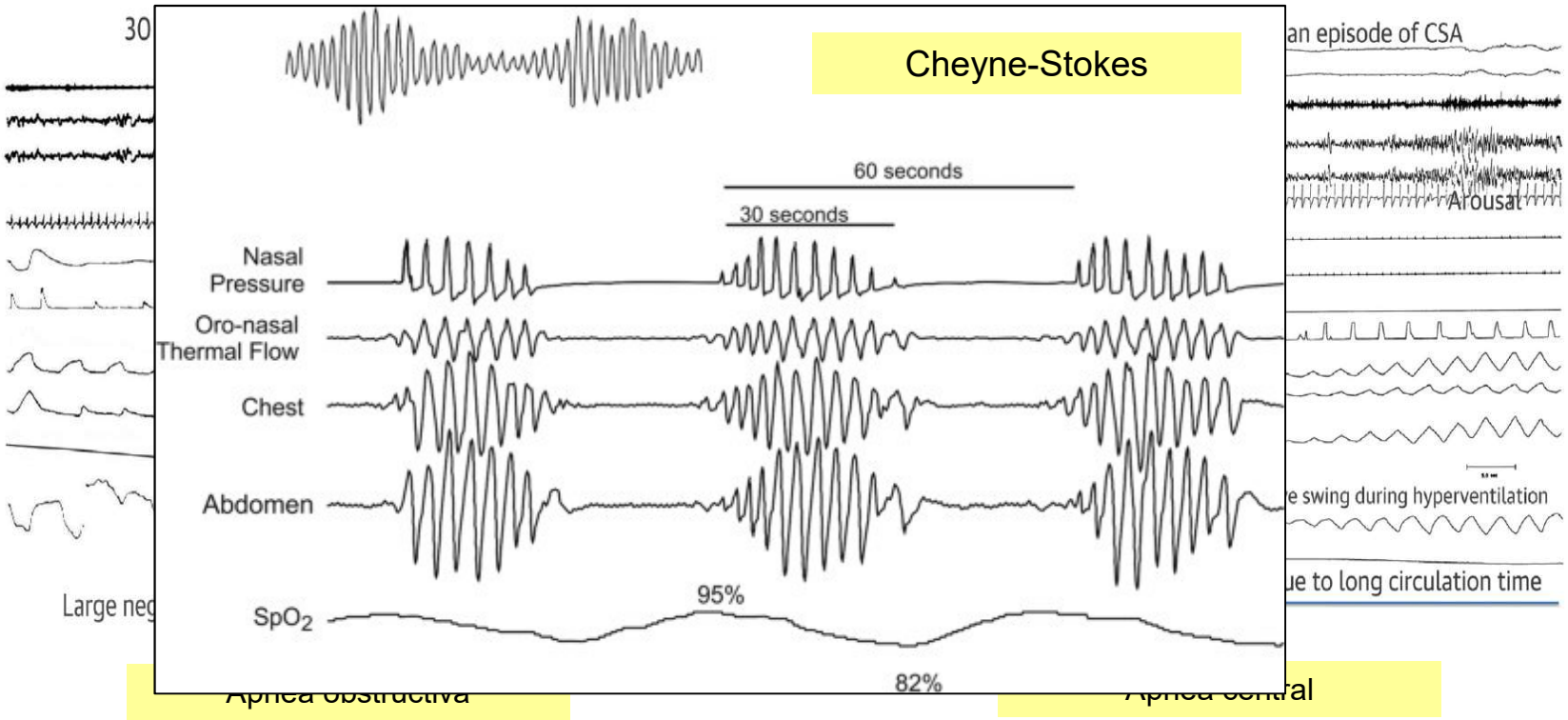

Apnea obstructiva




Apnea central

Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# TRASTORNS DEL SON EN LES PERSONES GRANS




Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# TRASTORNS DEL SON EN LES PERSONES GRANS

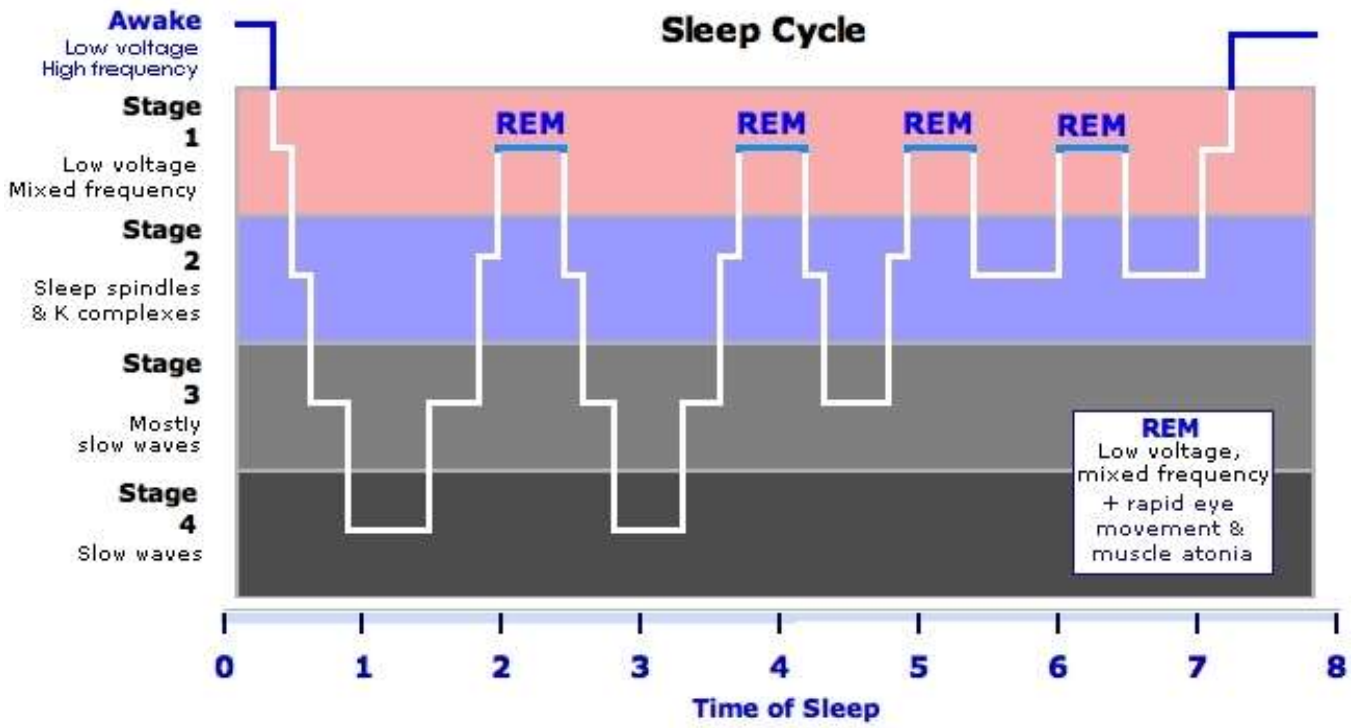
| | |
|---|---|
| Apnea obstructiva | Ausencia o reducción > 90% de la señal respiratoria (termistores, cánula nasal o neumotacógrafo) de > 10 segundos de duración en presencia de esfuerzo respiratorio detectado por las bandas toracoabdominales |
| Apnea central | Ausencia o reducción > 90% de la señal respiratoria (termistores, cánula nasal o neumotacógrafo) de > 10 segundos de duración en ausencia de esfuerzo respiratorio detectado por las bandas toracoabdominales |
| Apnea mixta | Es un evento respiratorio que, habitualmente, comienza con un componente central y termina en un componente obstructivo |
| Hipopnea[a] | Reducción discernible (> 30% y < 90%) de la amplitud de la señal respiratoria de > 10 segundos de duración o una disminución notoria del sumatorio toracoabdominal que se acompaña de unas desaturación (≥ 3%) y/o un microdespertar en el EEG |
| Esfuerzos respiratorios asociados a microdespertares (ERAM) | Período > 10 segundos de incremento progresivo del esfuerzo respiratorio (idealmente detectado por un incremento progresivo de la presión esofágica que acaba, con un microdespertar (no hay una reducción evidente de la amplitud del flujo –criterio de hipopneas-). También puede detectarse por periodos cortos de limitación del flujo –aplanamiento de la señal de la sonda nasal o reducciones del sumatorio toracoabdominal acompañados de un microdespertar) |
| Índice de apneas hipopneas (IAH)[b] índice de alteración respiratoria (IAR)[b] | Suma del número de apneas e hipopneas (es el parámetro más frecuentemente utilizado para valorar la gravedad de los trastornos respiratorios durante el sueño. Consiste en la suma del número de apneas + hipopneas + ERAM por hora de sueño (o por hora de registro si se usa una poligrafía respiratoria). El IAR se corresponde con el *Respiratory Disturbance Index* (RDI) de la literatura |
| Definición de SAHS: SAHS = 1 + (A o B) | 1. IAR > 5 asociado a uno de los siguientes síntomas<br>A. Excesiva somnolencia diurna (ESD) no explicada por otras causas<br>B. Dos o más de los siguientes<br>B1. Asfixias repetidas durante el sueño<br>B2. Despertares recurrentes durante el sueño<br>B3. Percepción del sueño como no reparador<br>B4. Cansancio y/o fatiga durante el día<br>B5. Dificultades de concentración |

Reproducido modificado con permiso del Grupo Español de Sueño[1]. Definición del SAHS según la Academia Americana de los Trastornos del Sueño[2].

[a] No disponemos de una definición de hipopnea bien contrastada y no existe consenso universal en su definición: [b]Desde el punto de vista práctico puede considerarse al IAH y al IAR como términos superponibles. Es decir, los ERAM se incluyen como hipopneas.

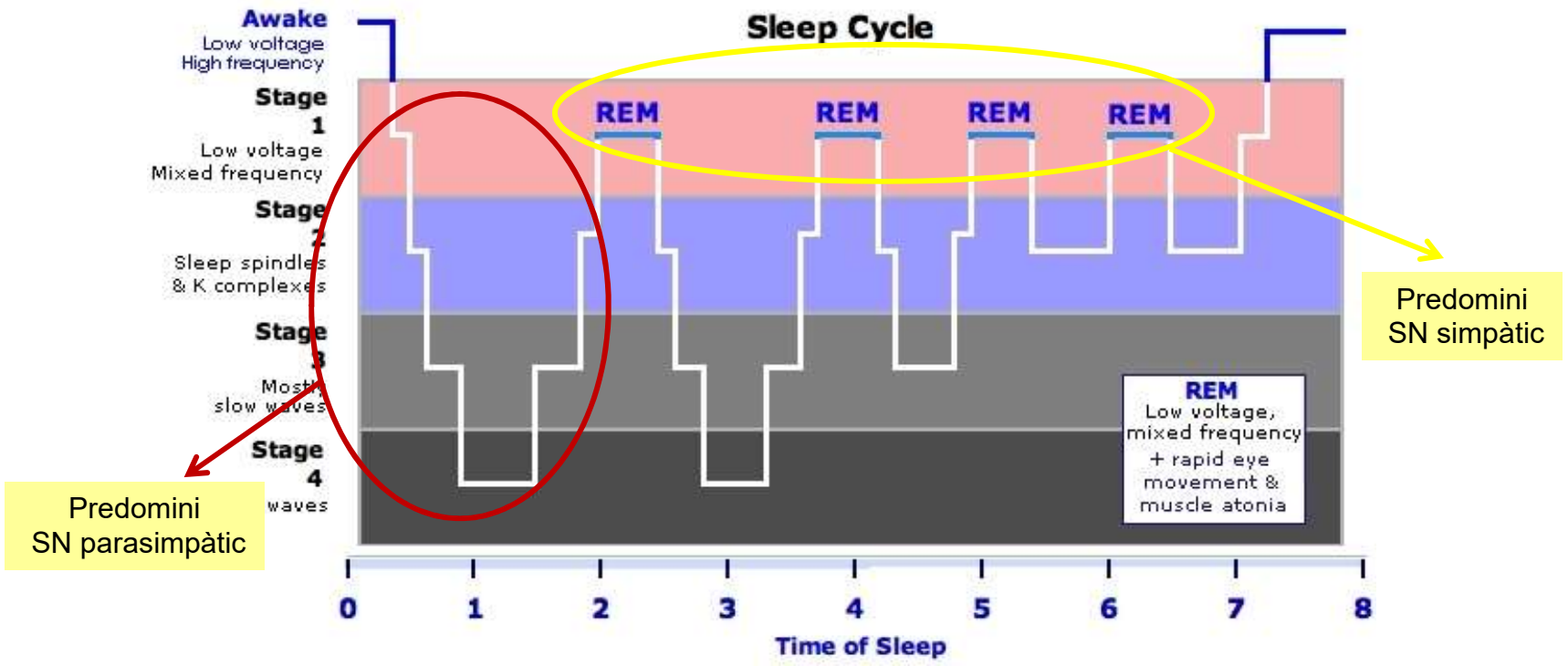
Lloberes P, et al. Arch Bronconeumol 2011;47(3):143-156

# TRASTORNS DEL SON EN LES PERSONES GRANS




Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

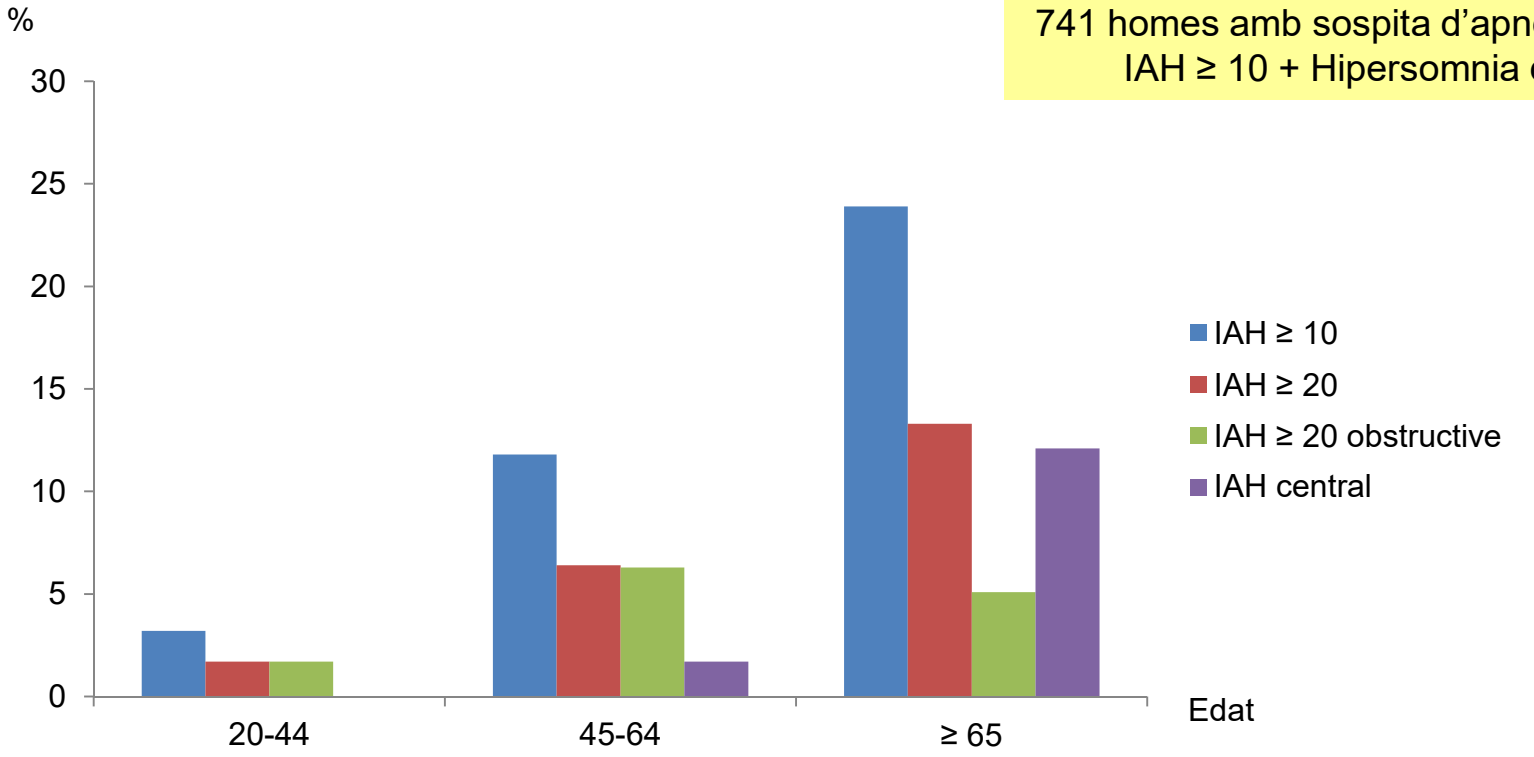
# TRASTORNS DEL SON EN LES PERSONES GRANS




Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

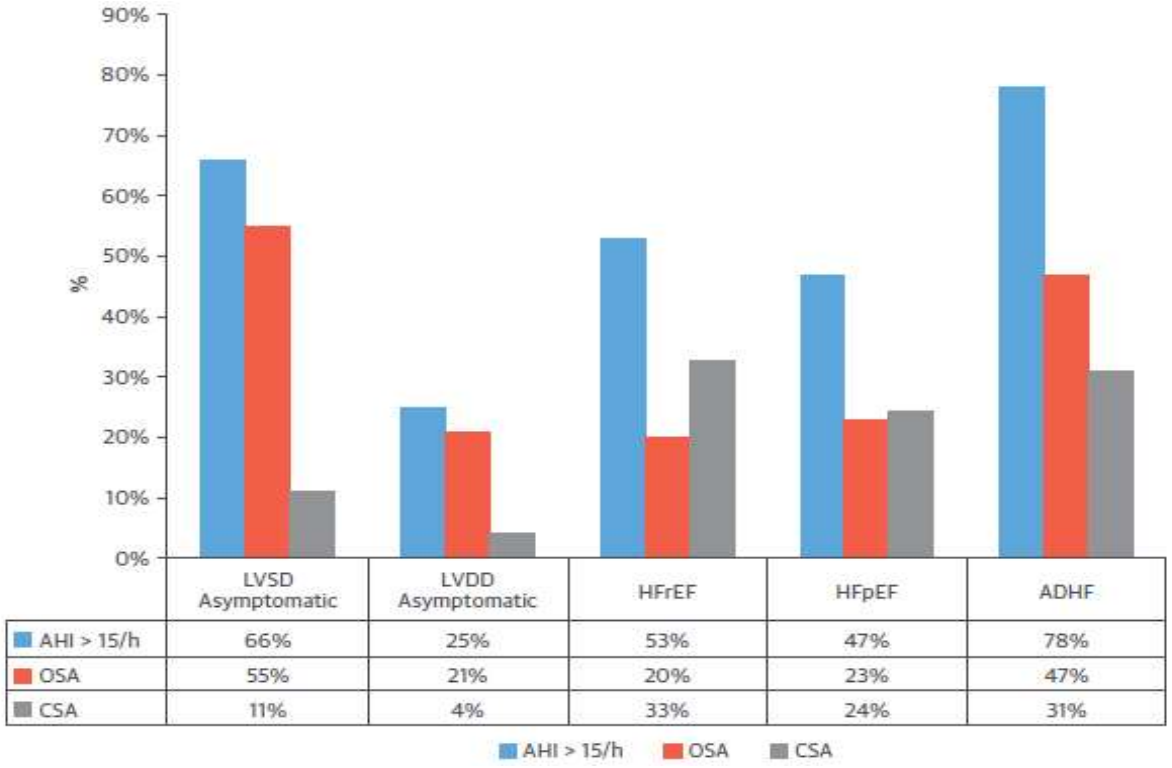
# TIPUS DE TRASTORNS DEL SON SEGONS L'EDAT

741 homes amb sospita d'apnees del son
IAH ≥ 10 + Hipersomnia diürna




Bixler Em, et al. Am Respir J Crit Care Med 1998;157:144-148

# TRASTORNS DEL SON A LA INSUFICIÈNCIA CARDIACA




| | LVSD Asymptomatic | LVDD Asymptomatic | HFrEF | HFpEF | ADHF |
|---|---|---|---|---|---|
| AHI > 15/h | 66% | 25% | 53% | 47% | 78% |
| OSA | 55% | 21% | 20% | 23% | 47% |
| CSA | 11% | 4% | 33% | 24% | 31% |

Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# TRASTORNS DEL SON A LA INSUFICIÈNCIA CARDIACA

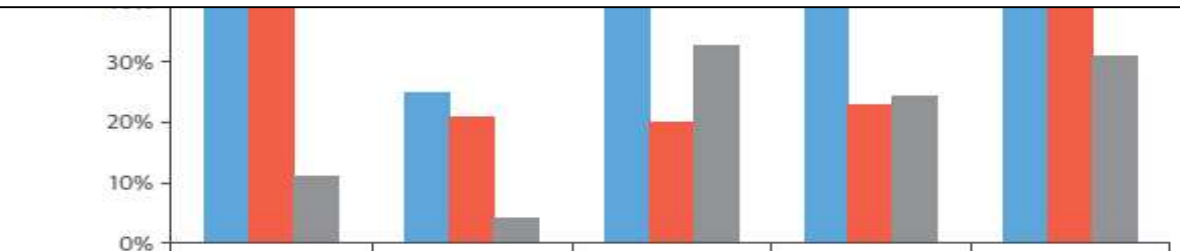
CHEST CLINIC

OPINION

## Cheyne–Stokes respiration: friend or foe?

Matthew T Naughton

Thorax 2012;67:357-360

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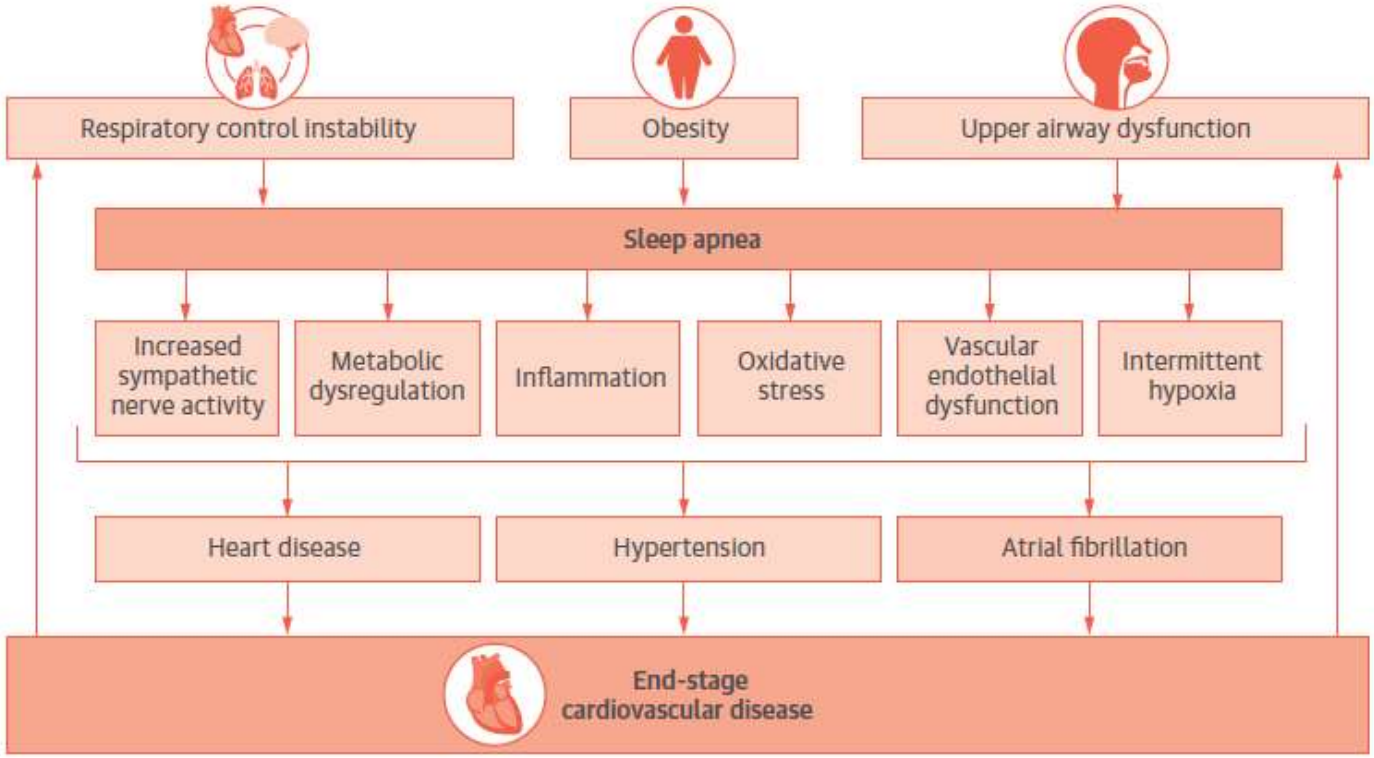
AHI > 15/h OSA CSA

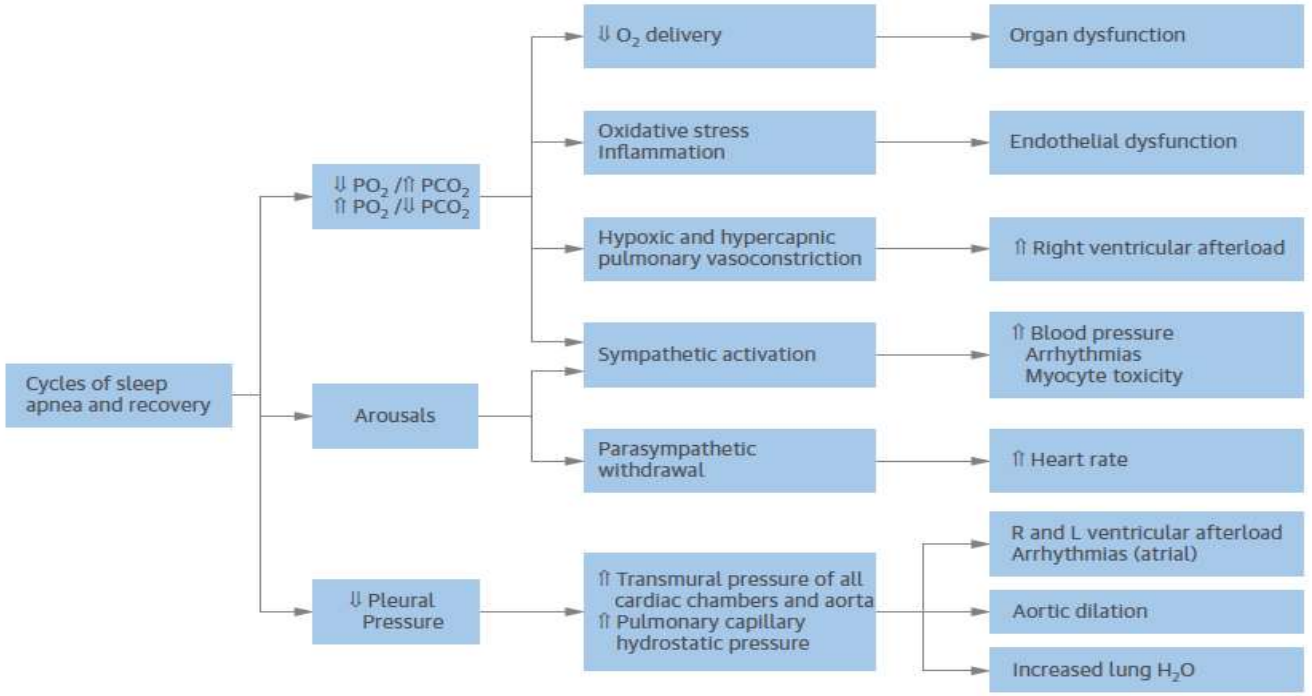
Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# FISIOPATOLOGIA: ALTERACIONS GENERALS



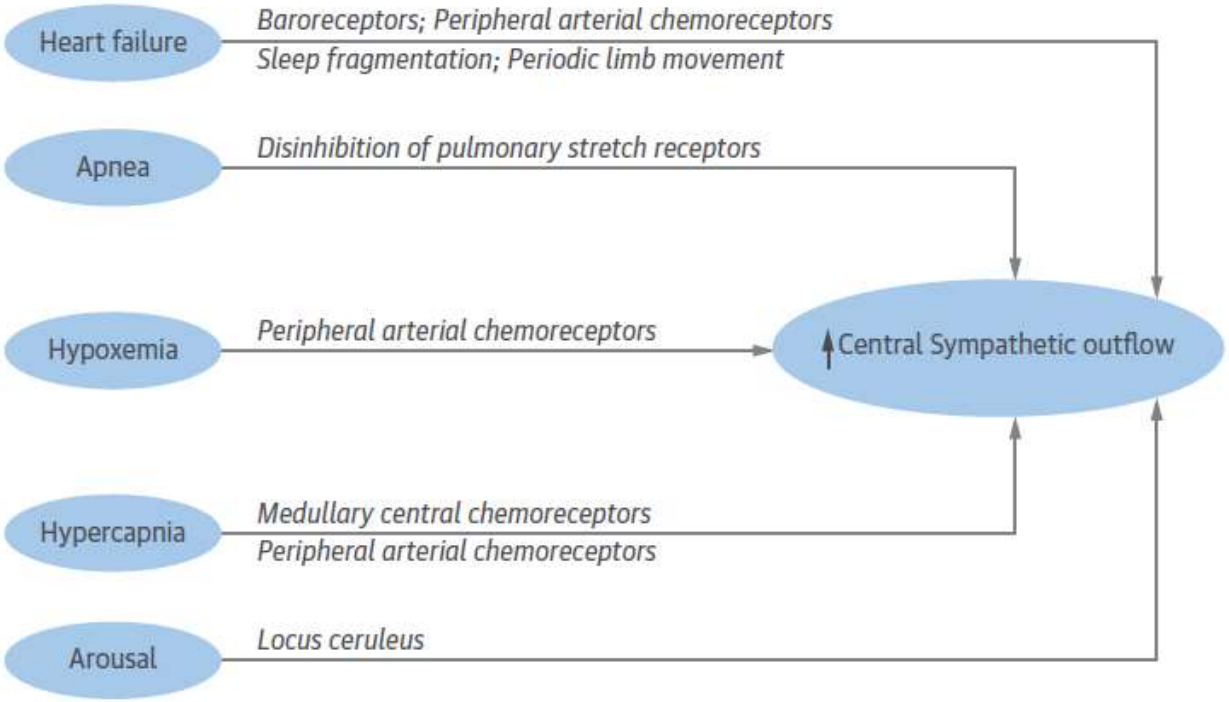

Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# IMPACTE DE LES ALTERACIONS VENTILATÒRIES SOBRE EL SISTEMA CIRCULATORI



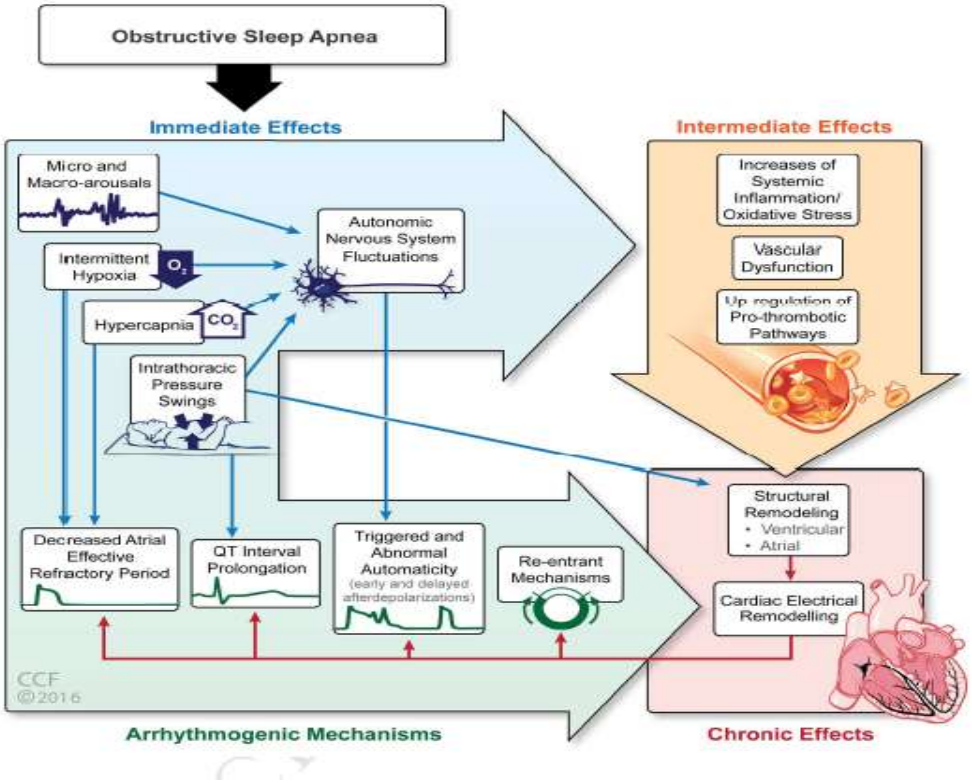

Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# HIPERESTIMULACIÓ DEL SISTEMA NERVIÓS SIMPÀTIC




Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# MECANISMES ARITMOGÈNICS




Escurçament del període refractari auricular (disbalanç entre activació vagal i simpàtica durant i post-apnea): "focal atrial firing"

La hipòxia intermitent genera zones de diferent excitabilitat miocàrdica

Augment de la pressió telediastòlica i de la pressió intrauricular pels canvis sobtats de la pressuó intratoràcica durant les apnees obstructives

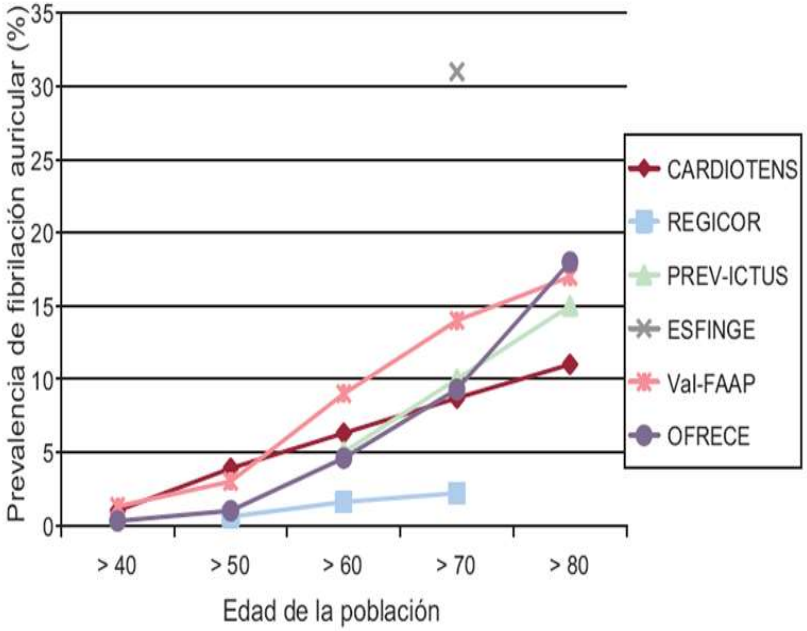
Augment de l'activitat simpàtica per hiperactivació dels qumioreceptors centrals i perifèrics

Allargament interval QT, alteració dels automatismes

May A, et al; CHEST 2017;151(1):225-241

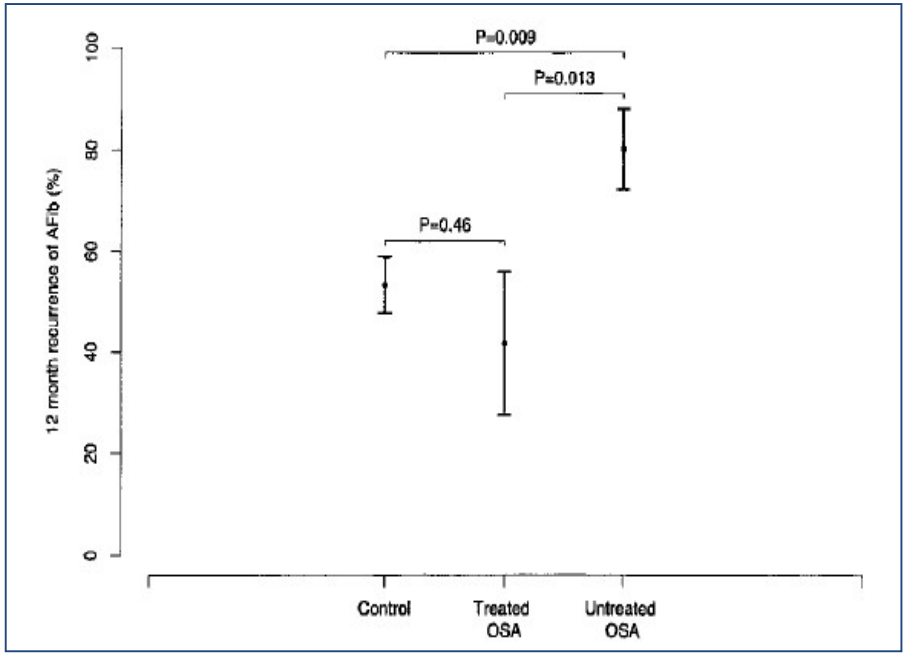
# INCIDÈNCIA DE FIBRIL.LACIÓ AURICULAR I TRASTORNS DEL SON

Prevalença de FA segons l'edat




Pérez-Villacastín et al, Rev Esp Cardiol 2013;66:561-65
Clua Espuny et al, Rev Esp Cardiol 2013;66:545-552

Recurrències de FA post-cardioversió elèctrica




Kanagala R, et al; Circulation 2003;107:2589-2594

# Nocturnal Arrhythmias Across a Spectrum of Obstructive and Central Sleep-Disordered Breathing in Older Men

| Quartile or Category | Atrial Fibrillation/Atrial Flutter | | Complex Ventricular Ectopy | |
|---|---|---|---|---|
| | Unadjusted | Adjusted[b] | Unadjusted | Adjusted[b] |
| RDI quartile | | | | |
| RDI < 5.9 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 5.9 ≤ RDI < 12.6 | 1.22 (0.70-2.15) | 1.38 (0.74-2.57) | 1.07 (0.86-1.33) | 1.00 (0.79-1.27) |
| 12.6 ≤ RDI < 23.9 | 1.50 (0.87-2.57) | 1.58 (0.85-2.91) | 1.31 (1.06-1.63) | 1.31 (1.04-1.66) |
| RDI ≥ 23.9 | 2.40 (1.46-3.97)[c] | 2.15 (1.19-3.89)[c] | 1.61 (1.30-1.99)[c] | 1.43 (1.12-1.82)[c] |
| OAHI quartile | | | | |
| OAHI < 2.9 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 2.9 ≤ OAHI <6.5 | 1.32 (0.78-2.22) | 1.49 (0.83-2.67) | 1.10 (0.88-1.37) | 1.12 (0.88-1.41) |
| 6.5 ≤ OAHI < 12.7 | 1.24 (0.73-2.10) | 1.21 (0.66-2.21) | 1.20 (0.96-1.49) | 1.18 (0.93-1.50) |
| OAHI ≥ 12.7 | 1.82 (1.11-2.97)[c] | 1.49 (0.83-2.68) | 1.58 (1.28-1.96)[c] | 1.37 (1.08-1.75)[c] |
| CAI category | | | | |
| CAI = 0 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 0 < CAI ≤ 1 | 0.77 (0.47-1.25) | 0.81 (0.49-1.36) | 0.83 (0.69-0.99) | 0.84 (0.69-1.02) |
| 1 < CAI <3 | 1.58 (0.91-2.73) | 1.05 (0.53-2.05) | 0.98 (0.76-1.26) | 1.03 (0.79-1.35) |
| CAI > 3 | 3.17 (2.00-5.03)[c] | 2.69 (1.61-4.47)[c] | 1.32 (1.03-1.70) | 1.27 (0.97-1.66) |
| CSR-CSA | 5.20 (3.58-7.58) | 4.54 (2.96-6.96)[c] | 1.62 (1.28-2.05) | 1.55 (1.20-2.00) |
| TST < 90 category | | | | |
| (TST <90) <1 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 1 ≤ (TST < 90) < 3.5 | 1.14 (0.75-1.74) | 1.33 (0.84-2.12) | 1.33 (1.11-1.61) | 1.31 (1.07-1.60) |
| 3.5 ≤ (TST < 90) < 10 | 1.14 (0.66-1.95) | 1.11 (0.59-2.07) | 1.27 (1.01-1.62) | 1.27 (0.97-1.66) |
| (TST < 90) ≥ 10 | 1.54 (0.94-2.52) | 1.30 (0.71-2.40) | 1.89 (1.49-2.39)[c] | 1.62 (1.23-2.14)[c] |

2911 pacients
Edat 76.4 ± 5.5 anys
Incidència de FA nocturna o EEVV complexes segons la gravetat I tipus de trastorn del son

Mehra R, et al; Arch Intern Med. 2009;169(12):1147-1155

Nocturnal Arrhythmias Across a Spectrum of Obstructive and Central Sleep-Disordered Breathing in Older Men

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| OAHI quar | | | | |
| OAHI < | | | | |
| 2.9 ≤ O | | | | |
| 6.5 ≤ OA | | | | |
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| CAI category | | | | |
| CAI = 0 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 0 < CAI ≤ 1 | 0.77 (0.47-1.25) | 0.81 (0.49-1.36) | 0.83 (0.69-0.99) | 0.84 (0.69-1.02) |
| 1 < CAI ≤ 3 | 1.58 (0.91-2.73) | 1.05 (0.53-2.05) | 0.98 (0.76-1.26) | 1.03 (0.79-1.35) |
| CAI > 3 | 3.17 (2.00-5.03)[c] | 2.69 (1.61-4.47)[c] | 1.32 (1.03-1.70) | 1.27 (0.97-1.66) |
| CSR-CSA | 5.20 (3.58-7.58) | 4.54 (2.96-6.96)[c] | 1.62 (1.28-2.05) | 1.55 (1.20-2.00) |
| TST < 90 category | | | | |
| (TST < 90) < 1 | 1 [Reference] | 1 [Reference] | 1 [Reference] | 1 [Reference] |
| 1 ≤ (TST < 90) < 3.5 | 1.14 (0.75-1.74) | 1.33 (0.84-2.12) | 1.33 (1.11-1.61) | 1.31 (1.07-1.60) |
| 3.5 ≤ (TST < 90) < 10 | 1.14 (0.66-1.95) | 1.11 (0.59-2.07) | 1.27 (1.01-1.62) | 1.27 (0.97-1.66) |
| (TST < 90) ≥ 10 | 1.54 (0.94-2.52) | 1.30 (0.71-2.40) | 1.89 (1.49-2.39)[c] | 1.62 (1.23-2.14)[c] |

Major associació d'aritmies auriculars amb apnees centrals i aritmies ventriculars amb apnees obstructives

2911 pacients
Edat 76.4 ± 5.5 anys

Mehra R, et al; Arch Intern Med. 2009;169(12):1147-1155

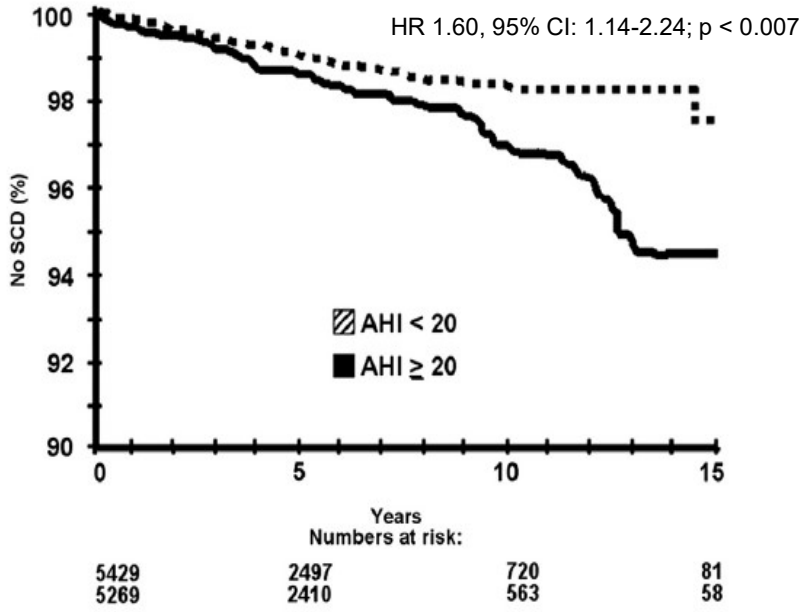
# Central Sleep-disordered Breathing Predicts Incident Atrial Fibrillation in Older Men

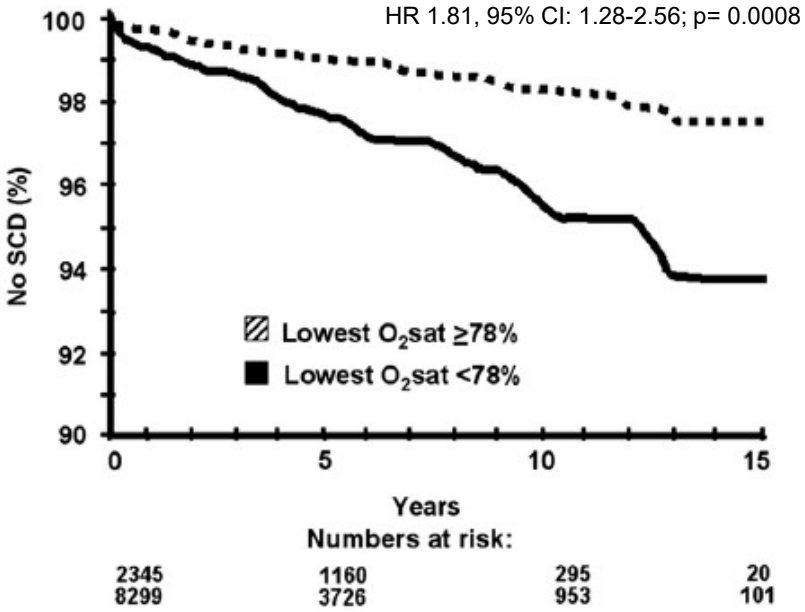
| Predictor | Events/Total | Minimally Adjusted OR* (95% CI) | Multivariable Adjusted OR† (95% CI) |
|---|---|---|---|
| Age <76 yr | | | |
| AHI per 5-unit increase | 57/529 | 0.95 (0.86–1.06) | 0.92 (0.82–1.04) |
| AHI <15 | 33/308 | 1.00 (reference) | 1.00 (reference) |
| AHI ≥15 | 24/221 | 0.96 (0.54–1.70) | 0.79 (0.42–1.49) |
| OAHI per 5-unit increase‡ | 57/529 | 0.95 (0.85–1.06) | 0.92 (0.82–1.04) |
| CAI <5 | 53/500 | 1.00 (reference) | 1.00 (reference) |
| CAI ≥5‡ | 4/29 | 1.33 (0.44–3.99) | 1.22 (0.34–4.41) |
| No CSA-CSR | 51/486 | | |
| CSA-CSR‡ | 6/43 | 1.36 (0.55–3.40) | 1.45 (0.52–4.07) |
| Percentage of total sleep time with $Sa_{O_2}$ <90% | | | |
| <1% | 29/276 | 1.00 (reference) | 1.00 (reference) |
| 1% to <3.5% | 11/139 | 0.69 (0.33–1.45) | 0.61 (0.28–1.35) |
| 3.5% to <10% | 12/61 | 2.13 (0.99–4.57) | 1.74 (0.71–4.24) |
| ≥10% | 5/53 | 0.78 (0.27–2.23) | 0.57 (0.18–1.82) |
| Age ≥76 yr | | | |
| AHI per 5-unit increase | 42/314 | **1.20 (1.08–1.33)** | **1.22 (1.08–1.39)** |
| AHI <15 | 16/183 | 1.00 (reference) | 1.00 (reference) |
| AHI ≥15 | 26/131 | **2.91 (1.43–5.90)** | **2.64 (1.16–6.00)** |
| OAHI per 5-unit increase‡ | 42/314 | **1.17 (1.05–1.30)** | 1.13 (0.98–1.29) |
| CAI <5 | 35/295 | 1.00 (reference) | 1.00 (reference) |
| CAI ≥5‡ | 7/19 | **4.86 (1.72–13.72)** | **9.97 (2.72–36.50)** |
| No CSA-CSR | 34/289 | 1.00 (reference) | 1.00 (reference) |
| CSA-CSR‡ | 8/25 | **3.88 (1.50–10.07)** | **6.31 (1.94–20.51)** |
| Percentage of total sleep time with $Sa_{O_2}$ <90% | | | |
| <1% | 14/140 | 1.00 (reference) | 1.00 (reference) |
| 1% to <3.5% | 13/97 | 1.34 (0.58–3.09) | 1.69 (0.65–4.40) |
| 3.5% to <10% | 7/39 | 1.93 (0.67–5.51) | 2.24 (0.69–7.30) |
| ≥10% | 8/38 | 2.38 (0.87–6.52) | 2.68 (0.77–9.34) |

May A, et al; Am J Respir Crit Care Med 2016, Apr 1; 193 (7):783-91

# Obstructive Sleep Apnea and the Risk of Sudden Cardiac Death
# A Longitudinal Study of 10,701 Adults

10701 pacients adults que es realitzen una polisomnografia entre 1987 i 2003; seguiment mitjà de 5.3 anys
Incidència de mort sobtada ressuscitada o fatal (0.27% annual); relació amb IAH, SatO2 nocturna I comorbilitats




Gami AS, et al; JACC 2013, 62:610-616

# Day–Night Pattern of Sudden Death in Obstructive Sleep Apnea

Revisió de les polisomnografies I certificats de defunció de 112 pacients amb mort sobtada de causa cardiaca
Comparació de les franges horàries de la mort I la presència o absència d'apnea obstructiva I segons grau d'IAH

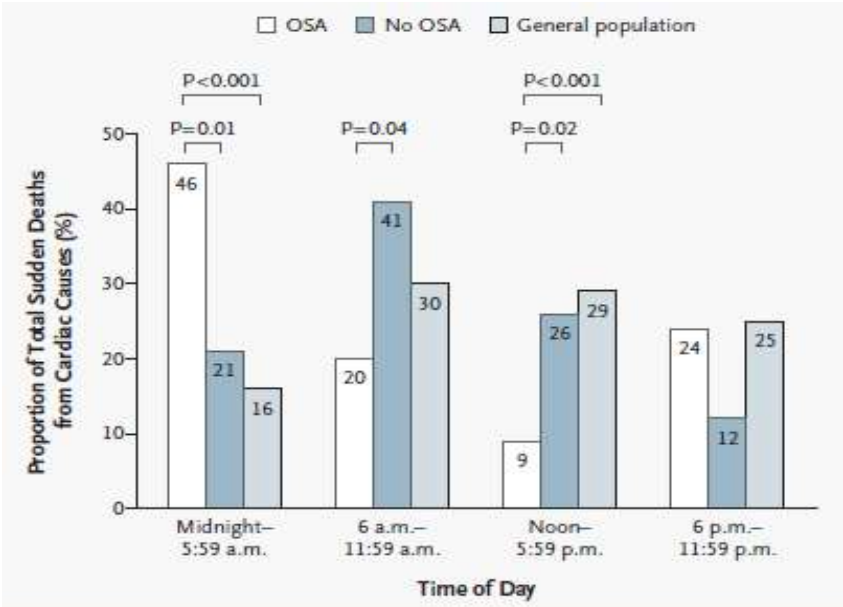
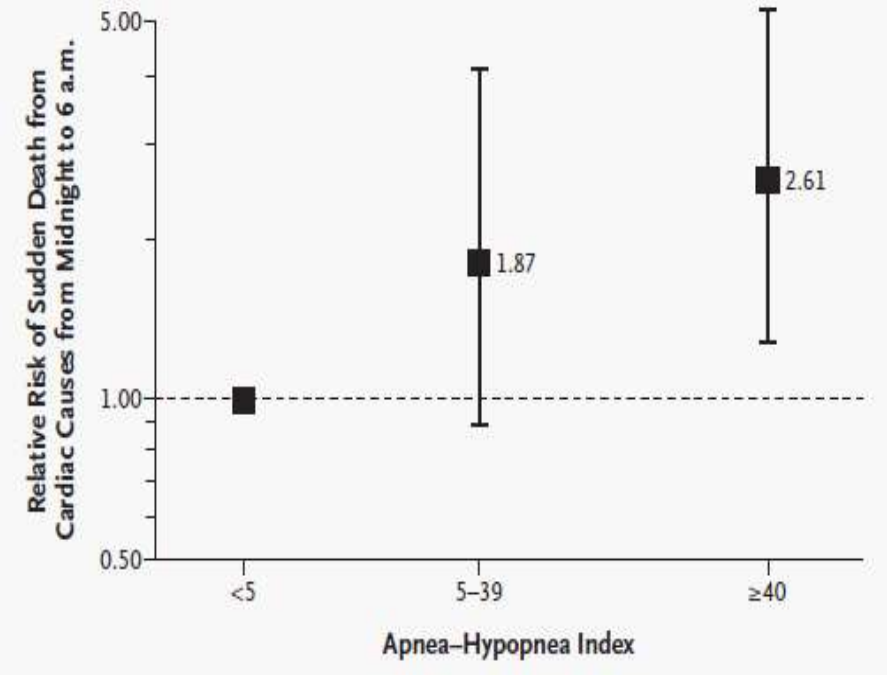
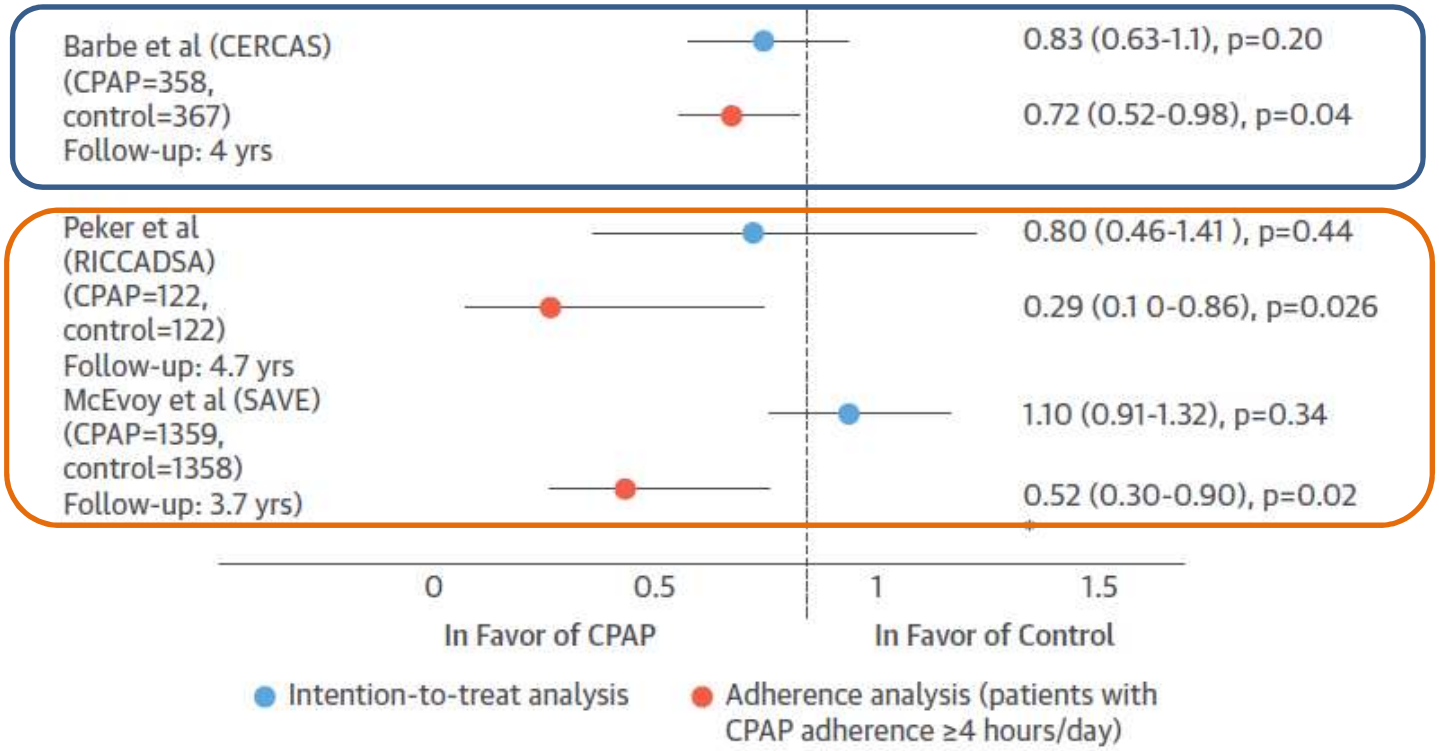



**Figure 1. Day–Night Pattern of Sudden Death from Cardiac Causes in 78 Persons with and 34 Persons without Obstructive Sleep Apnea (OSA) and in the General Population.**




Gami AS, et al; NEJM 2005, 352:1206-1214

Incidence risk for the primary composite endpoints in 3 RCTs in the CPAP compared with the control group




Javaheri, S. et al. J Am Coll Cardiol 2017;69(7):841–58

# CONCLUSIONS

Les apnees del son augmenten progressivament amb l'edat i provoquen alteracions fisiopatològiques amb una major morbi/mortalitat cardiovascular

La disregulació del sistema nerviós autònom i hiperestimulació del sistema simpàtic s'associa a una major incidència d'aritmies auriculars i ventriculars

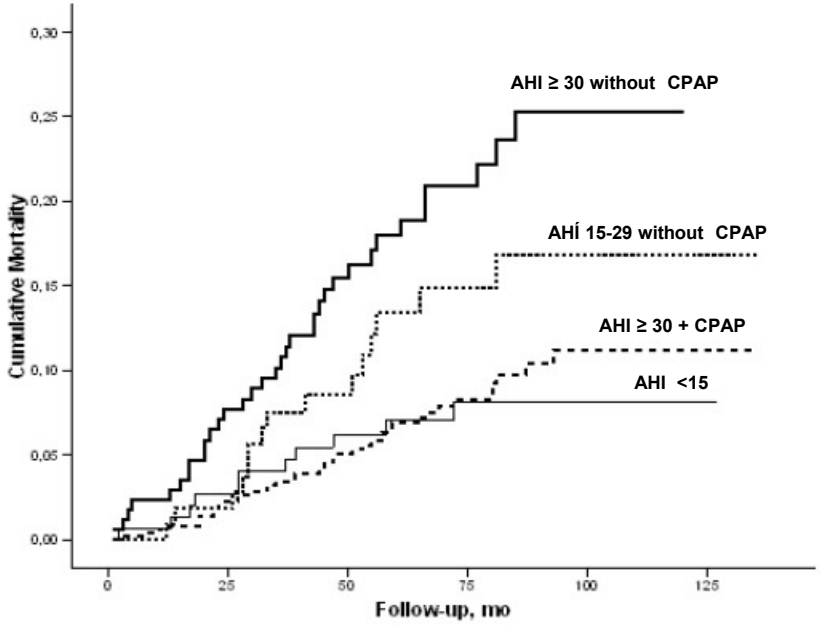
Les apnees centrals són freqüents als pacients amb insuficiència cardiaca, s'associen predominantment a la fibril.lació auricular i poden ser tant causa com conseqüència una de l'altra

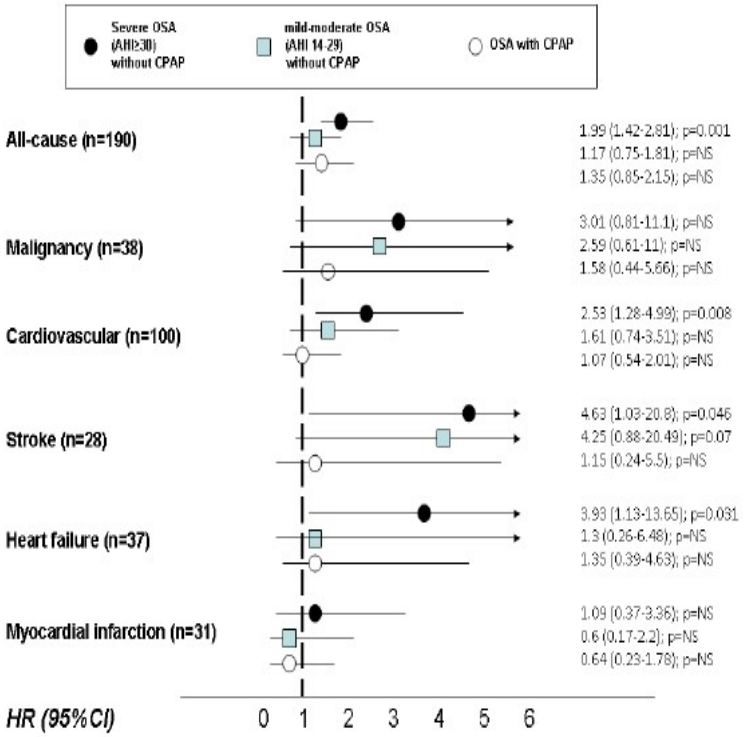
El tractament de les apnees obstructives millora la supervivència d'aquests pacients, sobretot si adherència a CPAP ≥ 4 hores/nit

Són necessaris més estudis en gent gran, tant per definir una millor estratificació de risc com per establir la millor estratègia terapèutica

# TRASTORNS DEL SON EN LES PERSONES GRANS

939 pacients d'edat ≥ 65 anys amb sospita de OSA (IAH ≥ 15)
EPP: mortalitat CV (CPAP vs no CPAP)




Martínez-García MA, et al; Am J Respir Crit Care Med 2012 Nov 1;186(9):909-16

# Cheyne-Stokes respiration: friend or foe?

50% of HF patients exhibit either obstructive sleep apnoea (OSA) or central sleep apnoea with Cheyne-Stokes pattern of respiration (CSA-CSR), explaining much of the morbidity/mortality of HF

The two apnoea types occur sometimes within the same patient at different times of the same night. However, they have different pathophysiological consequences that underpin different therapeutic strategies. Whereas OSA is considered injurious,CSA-CSR is a compensatory response to severe HF, and in itself may not be injurious to the cardiovascular system

CSA-CSR is associated with elevated PCWP, ventricular dilatation, atrial fibrillation, elevated sympathetic activity, plasma brain natriuretic peptide levels, increased central and peripheral chemosensitivity and a restrictive ventilatory defect with impaired transfer factor of the lung for carbon monoxide

Physiological benefits of CSA-CSR in HF akin to those seen with episodic CPAP: 1) increased lung volume with intrinsic PEEP; 2) augmented stroke volume; 3) avoidance of hypercapnic acidosis; 4) attenuated sympathetic activity; 5) bronchodilation ; 6) cyclic respiratory muscle rest

Naughton MT, et al; Thorax 2012;67:357-360