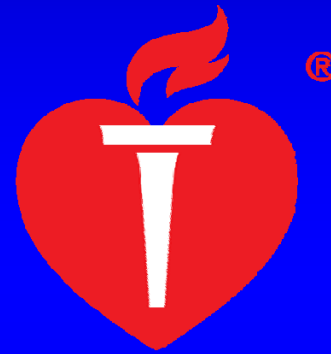


American Heart
Association



Learn and Live



AHA 2008
Sleep Apnea and Cardiovascular
Disease
Slide Set

Based on the AHA 2008 Scientific Statement
Sleep Apnea and Cardiovascular Disease

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Sleep Apnea and Cardiovascular Disease

**A Scientific Statement from the American Heart Association
Professional Education Committee of the Council for High Blood
Pressure Research, in collaboration with the American College
of Cardiology and the National Heart, Lung, and Blood Institute
National Center on Sleep Disorders Research**

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**This slide set was adapted from the
AHA 2008 Scientific Statement on
Sleep Apnea and Cardiovascular
Disease**

Circulation June 17, 2008

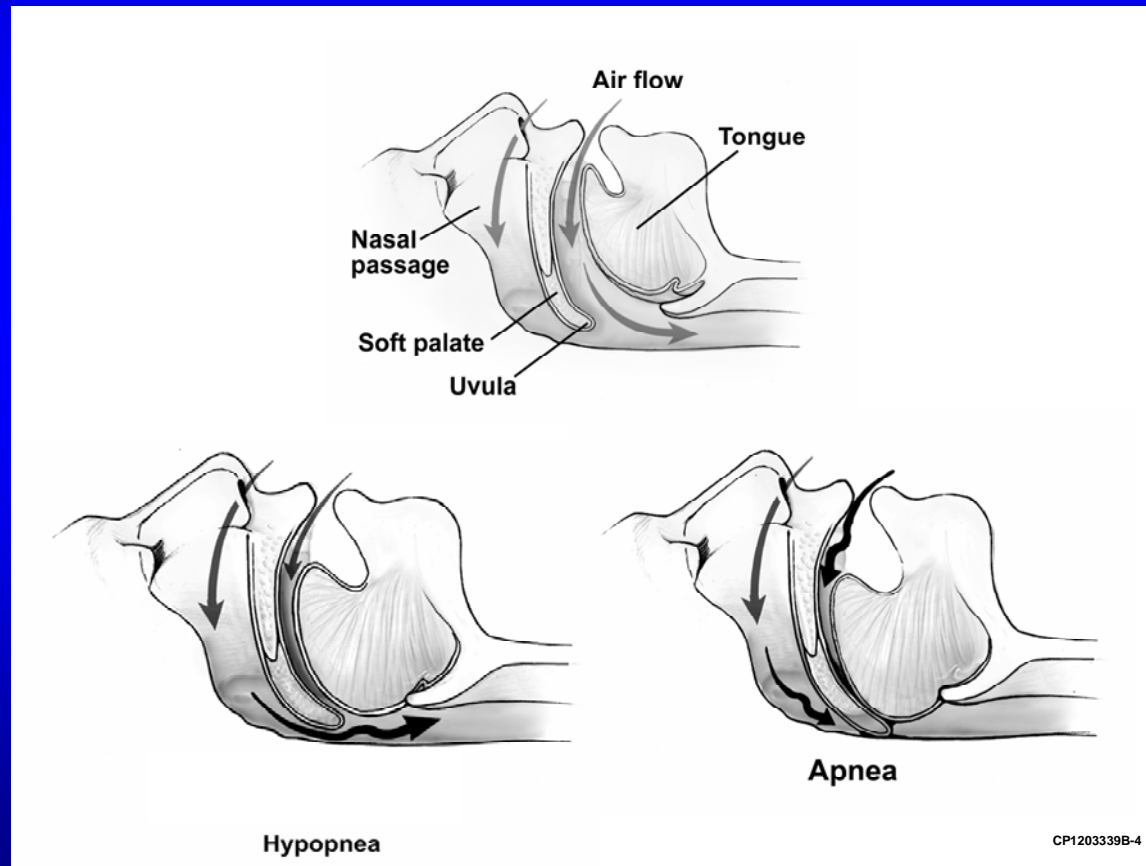


Sleep Apnea

- **Obstructive sleep apnea (OSA)** – repetitive interruption of ventilation during sleep caused by collapse of the pharyngeal airway
- **Central sleep apnea (CSA)** – repetitive cessation of ventilation during sleep resulting from loss of ventilatory drive



Partial and Complete Airway Obstruction Resulting in Hypopnea and Apnea



(From Comprehensive Hypertension)



Definitions

- **Apnea – cessation of airflow for >10 secs**
- **Hypopnea – Reduction in airflow to <50%, with desaturation and/or arousal**
- **Apnea Hypopnea Index – number of apneas and hypopneas per hour of sleep**



Prevalence - OSA

- **OSA is more common in men than women**
- **It affects an estimated 15 million adult Americans**
- **Approximately 1 in 5 adults has at least mild OSA and 1 in 15 has moderate to severe OSA**
- **OSA is more common in obese subjects**
- **Prevalence of OSA may also be increased 2- to 3-fold in patients with cardiovascular disease**
- **Prevalence of cardiovascular disease is higher in patients with OSA**



OSA – Signs, Symptoms, and Risk Factors

- **Disruptive snoring**
- **Witnessed apnea or gasping**
- **Obesity and/or enlarged neck size**
- **Hypersomnolence (less common in children and heart failure)**
- **Other – male gender, crowded oropharyngeal airway, increased BP, morning headache, sexual dysfunction, behavioral changes esp in children**



OSA – Screening and Diagnostic Tests

- Questionnaires
- Holter monitoring
- Overnight oximetry
- Home based/unattended overnight polysomnography
- In-hospital attended overnight polysomnography

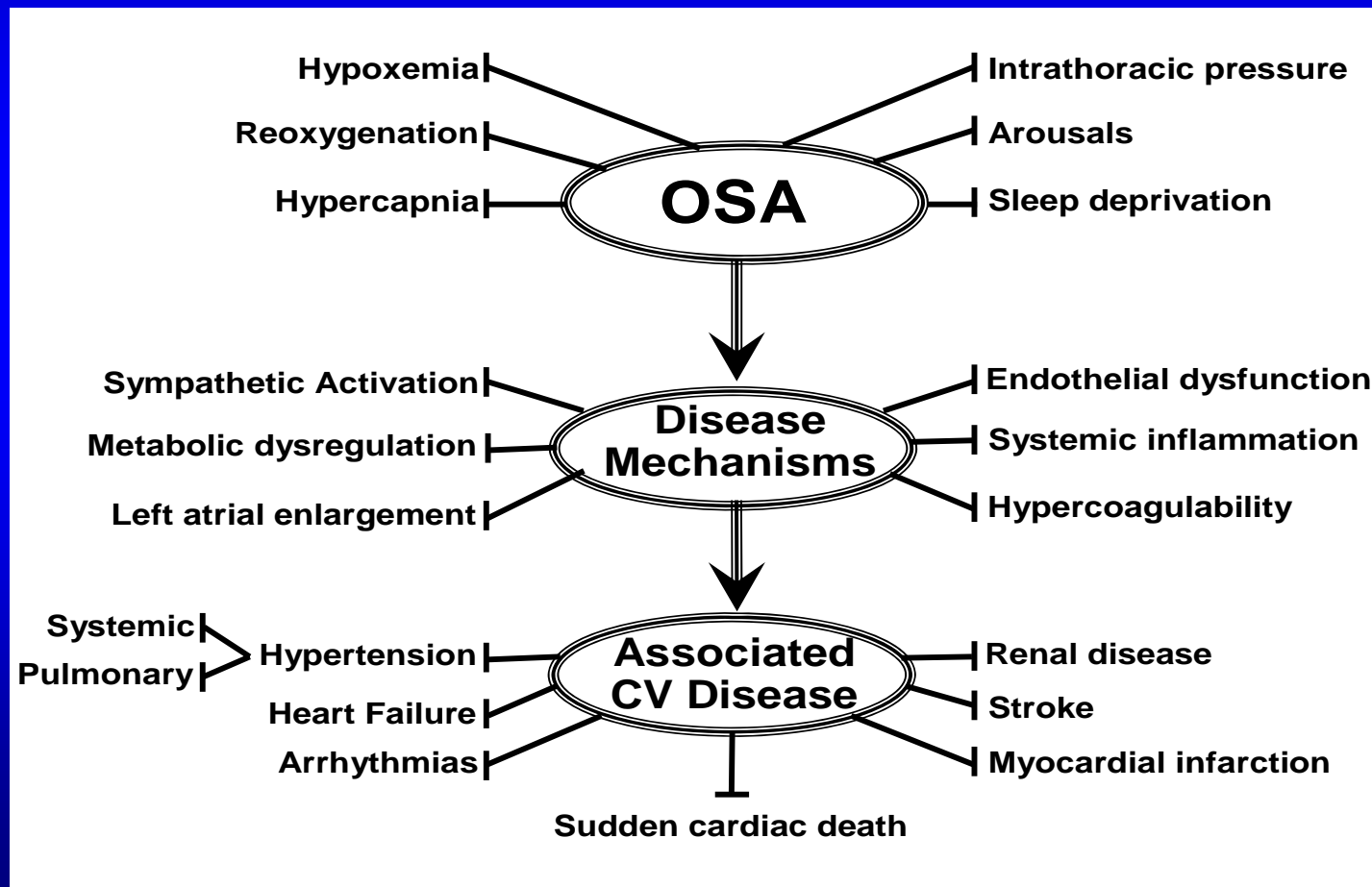


OSA – Treatment Options

- **Positional therapy**
- **Weight loss**
- **Avoidance of alcohol and sedatives**
- **Positive airway pressure**
- **Oral appliances**
- **Surgery –**
 - Uvulopalatopharyngoplasty**
 - Tonsillectomy**
 - Tracheostomy**



Schematic proposing pathophysiological components of OSA, activation of CV disease mechanisms, and associated CV disease conditions





OSA and Cardiovascular Disease

- **OSA has been linked to hypertension, heart failure, atrial fibrillation, stroke, myocardial infarction and nocturnal sudden death**
- **Longitudinal data confirm a likely etiologic role in hypertension**
- **For other diseases, evidence of etiologic role of OSA remains circumstantial**
- **CPAP or other treatment of OSA lowers BP modestly**
- **Very limited randomized controlled data of treating OSA in other CV diseases**



OSA in Children

- **Frequently due to adenotonsillar hypertrophy**
- **Adenotonsillectomy often an effective treatment**
- **Modest but increasing role for obesity**
- **After adenotonsillectomy, recurrence of OSA was predicted by race, BMI, and rapidity of increase of BMI**



OSA and Cardiovascular Disease in Children

- **Limited data available**
- **Associated with systemic hypertension**
- **Some studies suggest more severe OSA may be linked to changes in left ventricular structure and function**
- **Case series and anecdotal reports suggest a possible association with pulmonary hypertension**

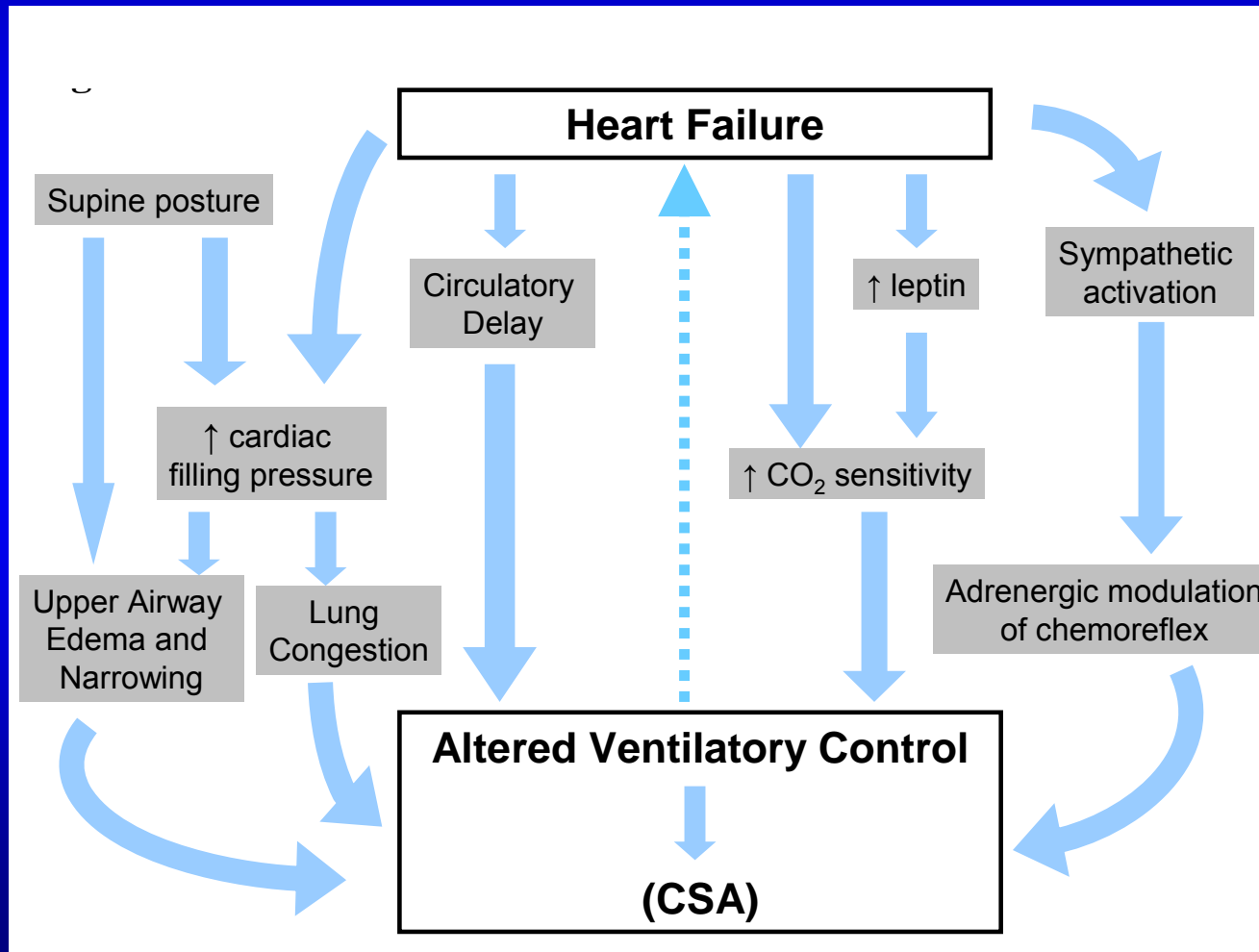


Prevalence - CSA

- **CSA is more common in men than women**
- **CSA prevalence increases with age**
- **Southern PA cohort study suggests CSA at a severity of 20 or more apneas per hour may be present in approx 5% of men older than 65**
- **Prevalence of CSA is increased in heart failure, left ventricular dysfunction, and stroke**



Schematic proposing mechanisms underlying development of CSA and possible feedback from CSA resulting in worsening of CHF (from Caples et al, J Appl Physiol 2005)





CSA and Heart Failure

- **CSA prevalence is increased in heart failure**
- **Causes of CSA are not well understood**
- **Presence of CSA in heart failure implies poor prognosis**
- **CANPAP study of CPAP treatment of CSA in heart failure showed no mortality reduction**
- **CPAP was only modestly effective in treating CSA**
- **Whether more effective and better tolerated therapy of CSA improves outcome in heart failure remains to be determined**



CSA – Signs, Symptoms, and Risk Factors

- Congestive heart failure
- Paroxysmal nocturnal dyspnea
- Witnessed apnea
- Fatigue/hypersomnolence
- Other – male gender, older age, mitral regurgitation, atrial fibrillation, central apnea when awake, periodic breathing during exercise, and hyperventilation with hypocapnia



CSA – Screening and Diagnostic Tests

- **Overnight oximetry**
- **Ambulatory (unattended) polysomnography**
- **In-hospital (attended) polysomnography**



CSA - Treatment Options

- **Optimize treatment of heart failure**
- **Positive airway pressure**
- **Supplemental oxygen**



Sleep Apnea - Challenges Ahead

- **Limited sleep medicine education in cardiovascular training programs**
- **Logistic and economic obstacles to widespread diagnosis and treatment of sleep apnea**
- **Co-morbidities such as obesity that obscure a clear understanding of any independent cardiovascular consequence of OSA per se**
- **Treatment options that are varied, predominantly device based and not always easily tolerated, particularly in patients with CSA**
- **Lack of robust randomized controlled studies of cardiovascular outcomes with treatment of sleep apnea**



Sleep Apnea and Cardiovascular Disease

**The full-text guideline is also
available on the American Heart
Association Web site:**

www.americanheart.org