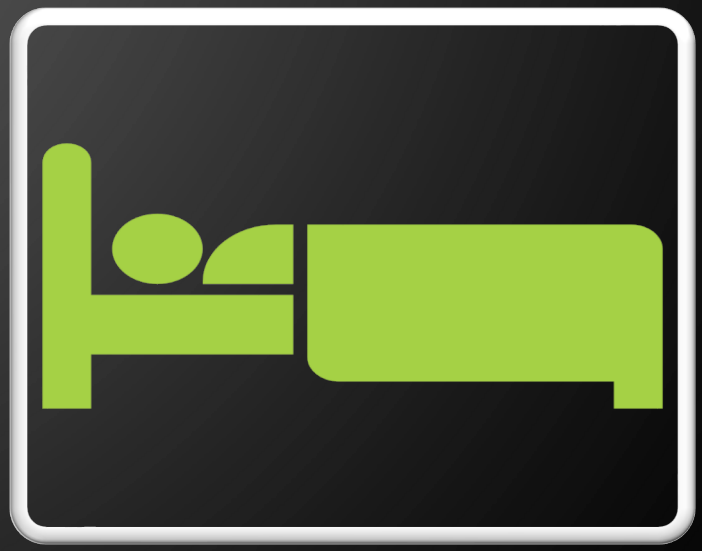
UNUSUAL PRESENTATION OF SLEEP APNEA



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WHY SLEEP IS SO IMPORTANT?

- WE SLEEP 30% OUR LIFE!
- QUALITY OF SLEEP IS THE MOST IMPORTANT FACTOR!
- SLEEP IS CARDIOVASCULAR HEALTH
- SLEEP IS NEUROCOGNITIVE HEALTH
- SLEEP IS METABOLIC HEALTH
- SLEEP IS REPRODUCTIVE HEALTH
- SLEEP IS MENTAL HEALTH
- SLEEP IS IMMUNE HEALTH

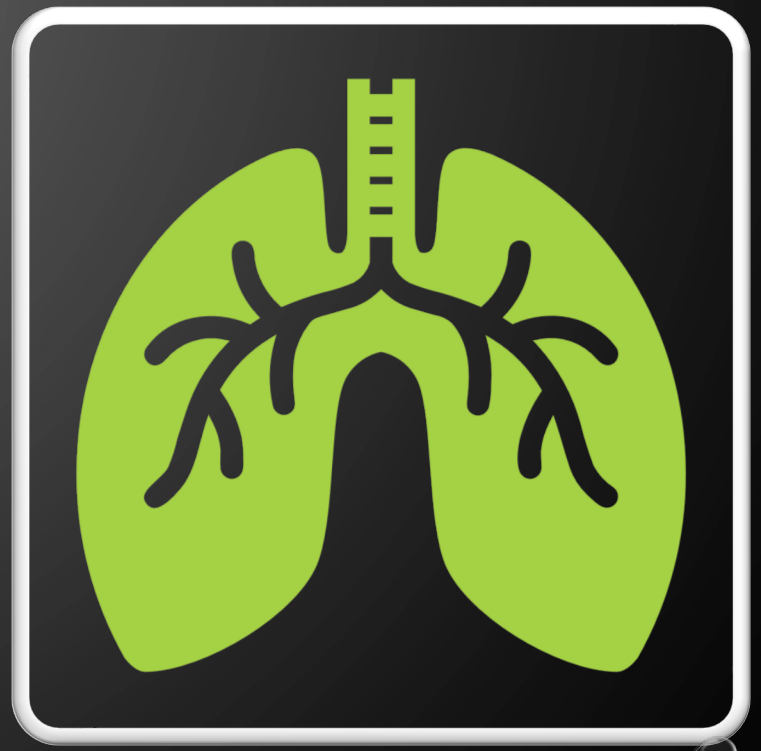
SLEEP APNEA STATISTIC

- 1 BILLION MIDDLE-AGED ADULTS WORLDWIDE
- 425 MILLIONS HAVE MODERATE TO SEVERE OSA
- 42 MILLIONS IN USA
- 85% OF PATIENTS HAVE NEVER BEEN DIAGNOSED
- 25% OF MEN
- 9% OF WOMEN

SLEEP APNEA DEFINITION AND SEVERITY

- APNEA/HYPOPNEA (>10 SEC/30 % AIRFLOW REDUCTION WITH 4% DESATURATION)

- **AHI** (APNEA HYPOPNEA INDEX), NOT RDI OR ODI
- **>5** IS POSITIVE
- **>15** IS MODERATE
- **>30** IS SEVERE



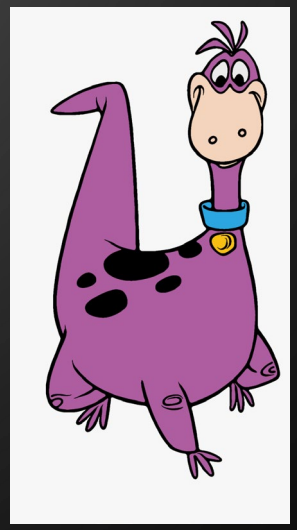
APNEA CAN COME IN ALL SHAPES AND SIZES

TYPICAL PRESENTATION

- MIDDLE-AGED
- MALE
- OVERWEIGHT
- LARGE NECK
- HTN
- CAD
- DM

ATYPICAL PRESENTATION

- YOUNG OR OLD
- FEMALE
- LOW BMI
- AF
- CHF
- COPD
- CHRONIC RX DRUG USE



SYMPTOMS OF SLEEP APNEA

TYPICAL

- SNORING/WITNESSED APNEAS
- EXCESSIVE DAYTIME SLEEPINESS (EDS)
- RESTLESS SLEEP

ATYPICAL

- Morning headaches
- Excessive sweating
- Depression
- Insomnia
- Memory loss
- Nocturia
- GERD
- Impotence

DIFFERENT STROKES FOR DIFFERENT FOLKS…

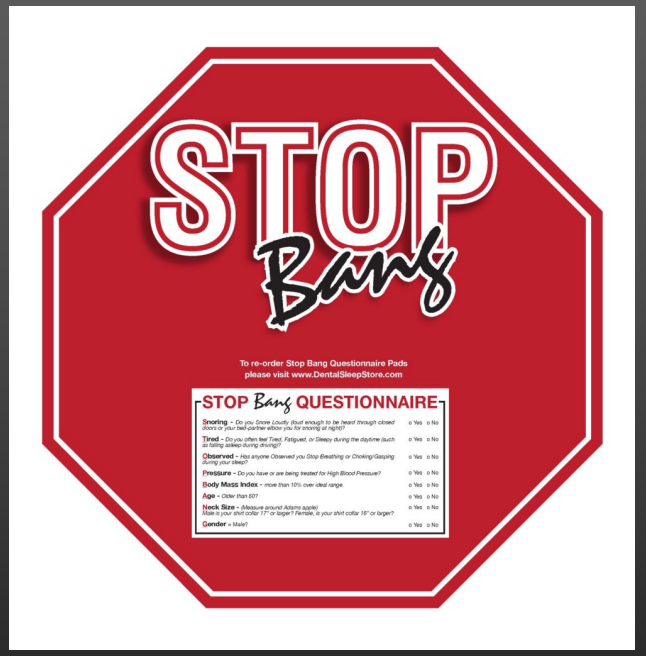
OBSTRUCTIVE (OSA)

- SNORING
- WITNESSED APNEAS
- FREQUENT AROUSALS
- EDS

CENTRAL (CSA)

- NO SNORING
- PATIENTS FREQUENTLY ARE NOT AWARE THAT THEY HAVE AROUSALS
- FATIGUE BUT FREQUENTLY MISINTERPRETED AS MEDICATION SIDE EFFECTS, DEPRESSION OR BURDEN OF CHF
- FREQUENT READMISSION DESPITE ADEQUATE CHF MEDICAL MANAGEMENT

STOPBANG



SNORING

TIRED

OBSERVED APNEAS

PRESSURE (BP)

BMI MORE THAN 35 KG/M2

AGE OVER 50 YEARS OLD

NECK CIRCUMFERENCE GREATER THAN 40 CM (17 IN)

GENDER MALE

HIGH RISK OF OSA: ANSWERING YES TO ***THREE OR MORE* ITEMS

WATCHPAT

- **HST**
- (ITAMAR MEDICAL)
- OPERATES ON **P**ERIPHERAL **A**RTERIAL **T**ONE (**PAT**) SIGNAL
- REFLECTING SYMPATHETIC NERVOUS SYSTEM ACTIVATION

SLEEP APNEA IN WOMEN

- MORE PREVALENT IN **POSTMENOPAUSAL** VS PREMENOPAUSAL WOMEN (1.9% VS 0.6%)
- POSTMENOPAUSAL WOMEN ON HRT HAVE SIMILAR PREVALENCE AS PREMENOPAUSAL (0.6% VS 0.5%)
- MORE COMMON IN BMI >32
- LOW PREVALENCE OF CSA 0.3%
- PREVALENCE INCREASES WITH AGE TO 65YR, THEN DECLINES

SLEEP APNEA WITH LOW BMI (LESS THEN 30)

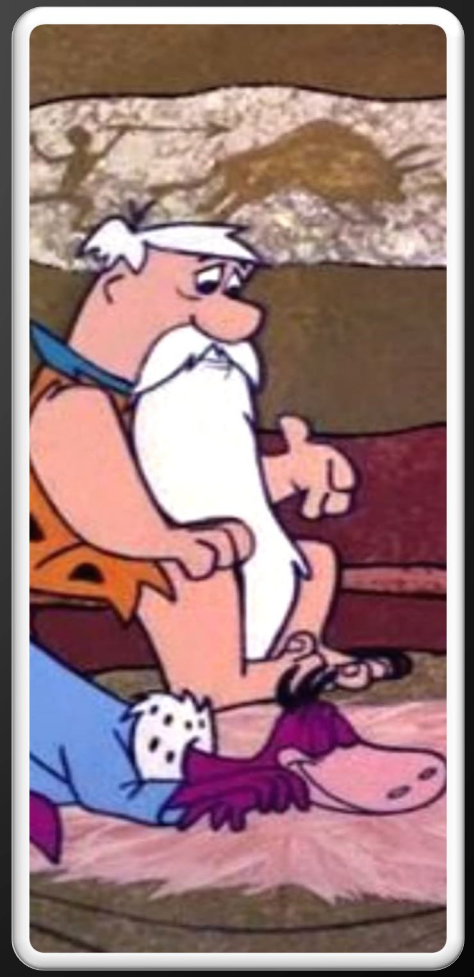
- NONOBESE INDIVIDUALS CONSTITUTE **20-25% OF OSA** POPULATION
- ANATOMICAL FACTORS: SMALL CRANIOFACIAL STRUCTURES, SMALL AIRWAY, SHORT NECK
- NON ANATOMICAL FACTORS: LOW RESPIRATORY AROUSAL THRESHOLD (RESULTED IN REPEATED AROUSALS “LIGHT SLEEPERS”)
- YOUNGER
- LESS SEVERE OSA
- NONOBESE PATIENTS WITH UNTREATED OSA MORE VULNERABLE TO FUTURE ADVERSE HEALTH CONSEQUENCES WITH WEIGHT GAIN AND INCREASED AGE

IS SLEEP APNEA INFLUENCED BY RACE ?

- AFRICAN-AMERICAN MAN YOUNGER THAN 40 INCREASED AHI BY 3.21 COMPARED TO A WHITE MAN IN THE SAME AGE RANGE WITH THE SAME BMI.
- FOR PARTICIPANTS BETWEEN 50 AND 59 INCREASED AHI BY 2.79
- IN ELDERLY AFRICAN AMERICANS, OSA RISK IS INCREASED 2-FOLD.
- THERE WAS NO DIFFERENCE IN AHI BETWEEN AFRICAN-AMERICAN AND WHITE WOMEN.

SLEEP APNEA IN ELDERLY

- OSA PREVALENCE INCREASES 2-3 TIMES IN OLDER PERSONS (>65 Y)
- THE PREVALENCE OF OSA IN OLDER PEOPLE IS 20-40%
- OLDER PATIENTS HAVE LOWER BMI
- EDS PERCEIVED AS LESS DEBILITATING
- POOR SLEEP SCHEDULE/HYGENE
- HIGHER CARDIAC AND NEURO COMORBIDITIES
- POLYPHARMACY
- DECLINE IN COGNITIVE FUNCTION WITH OSA MAY RESEMBLE DEMENTIA
- REDUCTION IN PHARYNGEAL MUSCLE FUNCTION
- REDUCTION IN UPPER AIRWAY REFLEX SENSITIVITY AND GENIOGLOSSUS RESPONSE TO HYPOXIA LEADING TO AGE RELATED PREDISPOSITION TO UPPER AIRWAY COLLAPSE



SLEEP APNEA AND DEMENTIA

- STROKE
- MULTI INFARCT DEMENTIA
- NEUROCOGNITIVE IMPAIRMENT (VIGILANCE, EXECUTIVE FUNCTIONS, INDUCTIVE AND DEDUCTIVE THINKING, DRIVING, WORK PERFORMANCE)
- ALZHEIMER'S DEMENTIA PATIENTS HAVE A 5-FOLD INCREASED RISK OF OSA
- **50%** OF AD PATIENTS HAVE OSA AFTER INITIAL DIAGNOSIS
- HIGHER AMYLOID BURDEN ON PET

SLEEP APNEA AND DEPRESSION

- **1.8-FOLD RISK** OF DEPRESSION IN OSA PATIENTS
- UNTREATED OSA CAUSES INCREASED RISK OF DEPRESSION
- COMMON SYMPTOMS (SLEEPINESS, FATIGUE, LOW ENERGY, COGNITIVE CHANGES)
- PROPOSED MECHANISMS: SLEEP DISRUPTION, INTERMITTENT HYPOXEMIA, PRO-INFLAMMATORY CYTOKINES
- COMORBID CHRONIC CONDITIONS (OBESITY, DM, CAD)

SLEEP APNEA IN CHRONIC DRUG USE

- MOST COMMON COMPLAINT IS INSOMNIA
- OSA, MIXED OR CSA
- YOUNGER
- LOW BMI
- OPIOIDS: **39%** OF PATIENTS HAVE **OSA** AND **30-90%** DISPLAY **CSA** IN DOSE-DEPENDENT FASHION.
- POLYSUBSTANCE ABUSE IS ADDITIVE
  - ALCOHOL PLUS NARCOTICS
  - ALCOHOL PLUS BENZODIAZEPINES
  - ALCOHOL PLUS CANNABIS
- METHADONE

SLEEP APNEA AND PULMONARY HYPERTENSION

- PH IS A CARDIOPULMONARY CONDITION
- SDB (OSA AND CSA) IS POTENTIAL ETIOLOGY
- PH PREVALENCE IN SDB RANGE 17-52%
- LEADS TO RIGHT VENTRICULAR OVERLOAD/HYPERTROPHY/DILATATION/FAILURE

ROLE OF OSA IN CARDIOVASCULAR DISEASE

- OSAS PREVALENCE IS **2-3 TIMES HIGHER** IN CARDIOVASCULAR PATIENTS.
- THE PREVALENCE OF OSAS IN HYPERTENSIVE PATIENTS IS ABOUT 30% BUT IN PATIENTS WITH DRUG-RESISTANT HYPERTENSION (AHI>10) IS ABOUT **83%**.
- THE PREVALENCE OF OSAS IN PATIENTS WITH **CAD** IS **30-60%.** AMONG MEN HOSPITALIZED FOR ACUTE MI, THE PREVALENCE OF OSAS REPORTED TO BE NEARLY 70%.
- **50%** OF STABLE, AMBULATORY **CHF** PATIENTS HAVE MODERATE TO SEVERE OSAS AND 30% HAVE CENTRAL SLEEP APNEA
- NOCTURNAL **ARRHYTHMIAS OCCUR IN UP TO 50 % OF OSAS** PATIENTS (AF, NSVT, SINUS ARREST, AV BLOCK AND PVCS).
- **50% OF AF** PATIENTS PRESENTING FOR CARDIOVERSION ARE LIKELY TO HAVE OSAS. THE PRESENCE OF UNTREATED OSAS IN PATIENT AFTER SUCCESSFUL CARDIOVERSION FOR AF IS ASSOCIATED WITH AN **82**% RISK FOR RECURRENCE OF AF IN 1 YEAR.
- SEVERAL STUDIES SHOWED THAT PATIENTS WHO REMAINED IN AF DESPITE AT LEAST 2 ABLATIONS HAD MUCH HIGHER PREVALENCE OF OSAS (**87%** VS **48**%).

CARDIO-VASCULAL SLEEP MEDICINE PILOT

- TOTAL PATIENTS TESTED – **1,495**
- SLEEP APNEA PREVALENCE – **78%**
  - MODERATE-SEVERE – **57%**
  - PATIENTS WITH MIXED/CSA – 195/1,495 (17%)
    - >30% CAHI – 121/195 (62%)
    - >50% CAHI – **33**/195 (17%)