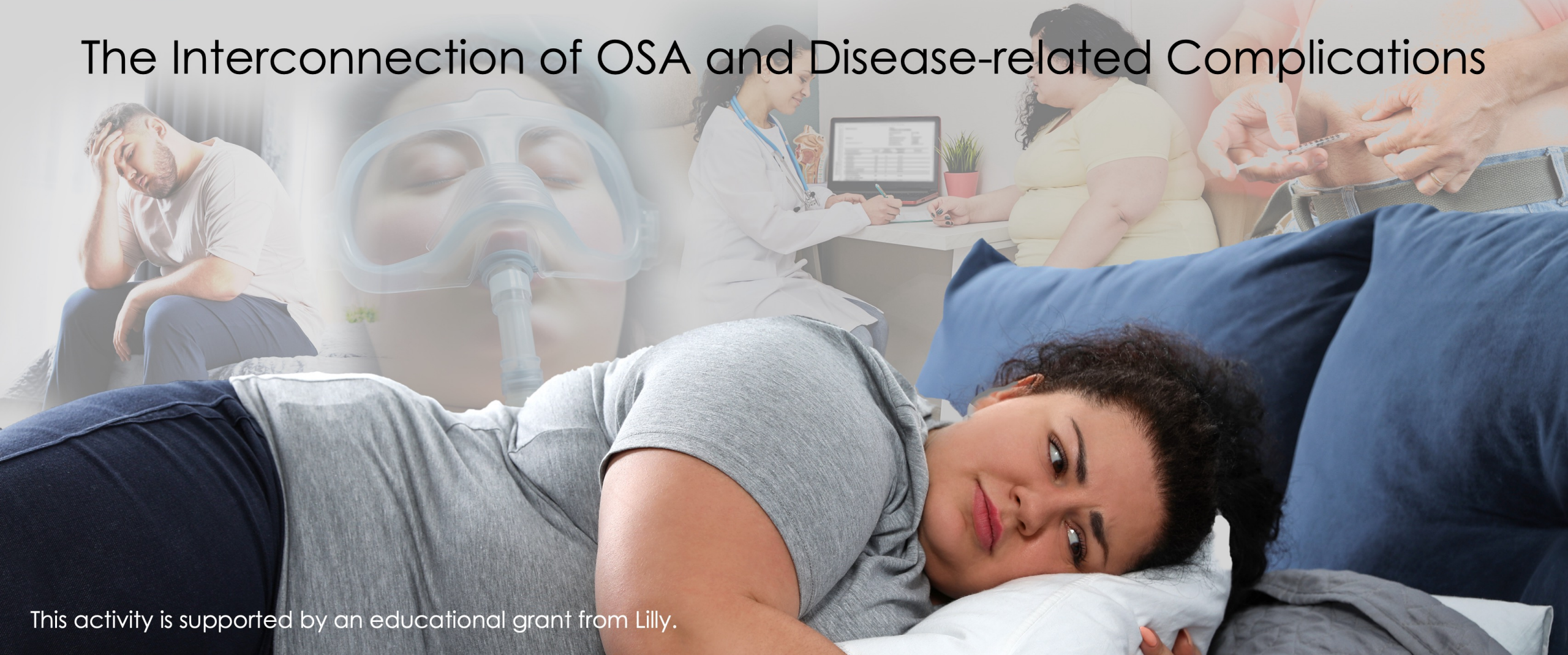




Breathing Easy: Conquering Obstructive Sleep Apnea for Better Health

The Interconnection of OSA and Disease-related Complications



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FACULTY



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AGENDA

10:00 The risks of undiagnosed and unmanaged OSA

10:00 Common comorbidities with OSA

10:00 High-risk and underserved populations in OSA





THE RISKS OF UNDIAGNOSED AND UNMANAGED OSA

OSA PRESENTATION



Decreased airflow due to repetitive complete or partial obstruction of the upper airway

- Causing partial reductions (hypopneas) and complete pauses (apneas) in breathing
- Associated with increased respiratory effort to overcome the obstruction



Associated with oxygen desaturation

- Leading to sleep fragmentation due to brief arousal from sleep that restores normal breathing
- Can occur hundreds of times per night



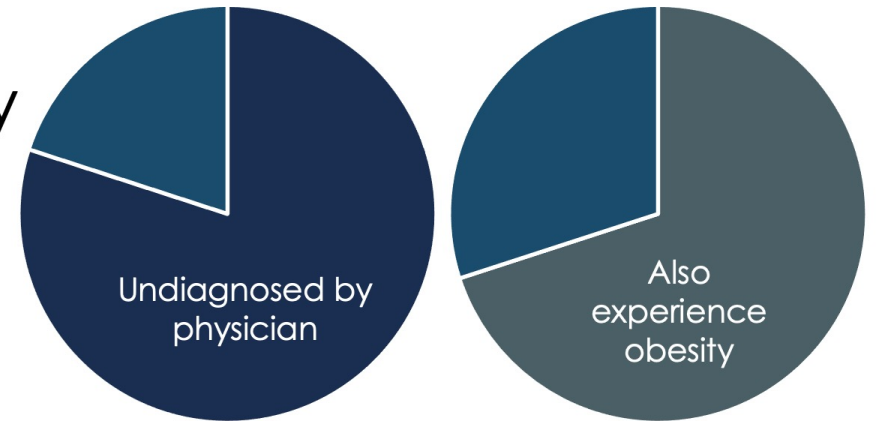
APNEAS

MOST	AS LONG
10-30 SEC	AS 60 SEC



THE RISKS OF UNDIAGNOSED AND UNMANAGED OSA

- **80-90%** of people with OSA remain undiagnosed, despite receiving adequate access to health care
- **70%** of people with OSA experience obesity
- Patients with untreated OSA
 - Among people with moderate or severe OSA, more than 2x risk of fatal events vs people with no or mild OSA
 - Hypertension, CVD, metabolic disorders, cognitive impairment



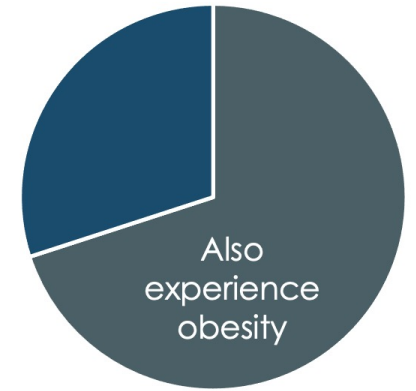
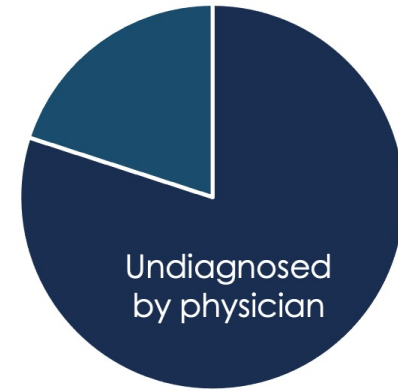
Lee W, et al. Epidemiology of Obstructive Sleep Apnea: a Population- based Perspective. Expert Rev Respir Med. 2008;2(3):349-364; Gleeson M, McNicholas WT. Bidirectional relationships of comorbidity with obstructive sleep apnoea. Eur Respir Rev. 2022;31(164):210256; Wang, H, et al. J Am Coll Cardio. 2008;49(15):1625-1631; Xia,F.;Sawan,M.Clinical and Research Solutions to Manage Obstructive Sleep Apnea: A Review. Sensors 2021, 21, 1784

THE RISKS OF UNDIAGNOSED AND UNMANAGED OSA



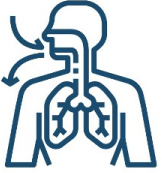
Effects of OSA include

- Fluctuating oxygen levels
- Increased heart rate
- Impaired glucose tolerance and insulin resistance
- Impaired concentration
- Mood changes
- Disturbed sleep of bed partner
- Increased healthcare utilization



Lee W, et al. Epidemiology of Obstructive Sleep Apnea: a Population- based Perspective. Expert Rev Respir Med. 2008;2(3):349-364; Gleeson M, McNicholas WT. Bidirectional relationships of comorbidity with obstructive sleep apnoea. Eur Respir Rev. 2022;31(164):210256.

SEVERE COMPLICATIONS OF OSA



- OSA associated with complications in metabolic and CV diseases
- Increased risk of mortality among people with OSA
 - Predisposing to heart failure
 - Associated with higher mortality in people with end stage renal failure
 - Greater mortality among people with chronic obstructive pulmonary disease (COPD)-OSA not treated with continuous positive airway pressure (CPAP)
 - Increased risk of involvement in motor vehicle accident

American Academy of Sleep Medicine (AASM), Sleep Apnea Fact Sheet: <https://aasm.org/resources/factsheets/sleepapnea.pdf>; Gleeson M, McNicholas WT. Bidirectional relationships of comorbidity with obstructive sleep apnoea. Eur Respir Rev. 2022;31(164):210256.



COMMON COMORBIDITIES WITH OSA

COMORBIDITIES ASSOCIATED WITH OSA

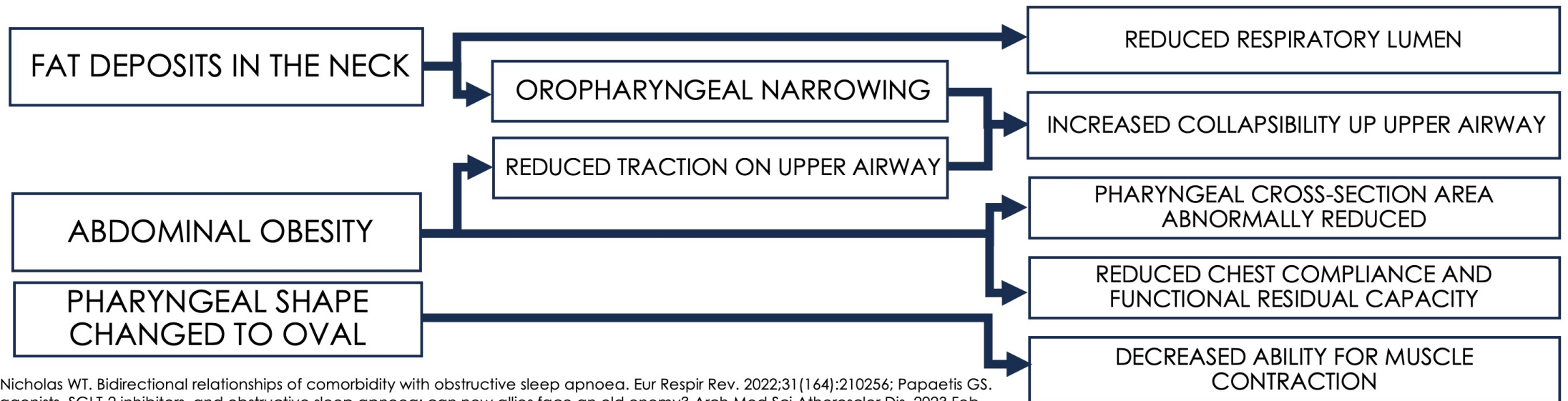
- Metabolic syndrome: patients at increased risk for OSA
 - Obesity:
 - 70% of people with OSA experience obesity
 - Weight gain is an important risk factor for development and worsening of OSA
 - Diabetes
 - Hypertension: OSA risk factor for hypertension
- Heart failure
 - Obesity also exacerbates cardiovascular comorbidities of OSA
- Renal dysfunction
- Stroke
- COPD
- Depression

Gleeson M, McNicholas WT. Bidirectional relationships of comorbidity with obstructive sleep apnoea. *Eur Respir Rev.* 2022;31(164):210256; St-Onge MP, Tasali E. Weight Loss Is Integral to Obstructive Sleep Apnea Management. Ten-Year Follow-up in Sleep AHEAD. *Am J Respir Crit Care Med.* 2021;203(2):161-162.

OSA AND EXCESS WEIGHT: CRITICAL RELATIONSHIP



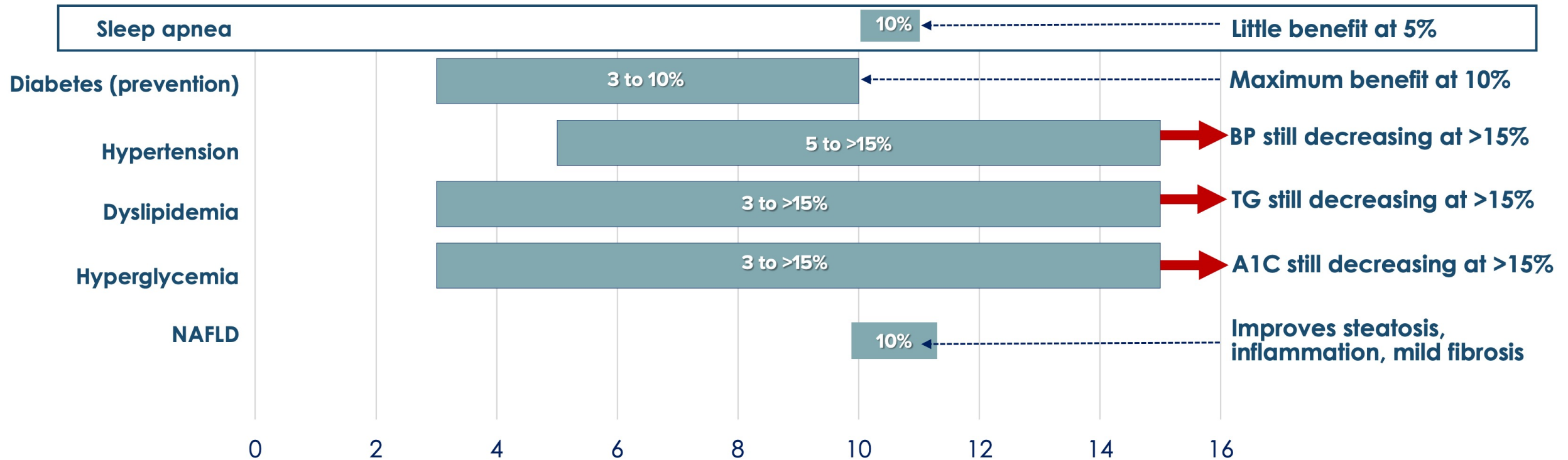
- Excess weight is the strongest factor in the risk and severity of OSA
- Weight management in OSA is critical
 - Particularly with people with Type II Diabetes
 - Weight loss by either medical, surgical, or lifestyle modifications approaches has positive impact on OSA severity and glycemic control with potential for for cure



Gleeson M, McNicholas WT. Bidirectional relationships of comorbidity with obstructive sleep apnoea. *Eur Respir Rev.* 2022;31(164):210256; Papaetis GS. GLP-1 receptor agonists, SGLT-2 inhibitors, and obstructive sleep apnoea: can new allies face an old enemy? *Arch Med Sci Atheroscler Dis.* 2023 Feb 28;8:e19-e34; St-Onge MP, Tasali E. Weight Loss Is Integral to Obstructive Sleep Apnea Management. Ten-Year Follow-up in Sleep AHEAD. *Am J Respir Crit Care Med.* 2021;203(2):161-162.

TREATING THE OBESITY: THERAPEUTIC WEIGHT LOSS REDUCES COMPLICATIONS

Weight loss required for therapeutic benefit (%)



GERD, gastroesophageal reflux disease; NAFLD, nonalcoholic fatty liver disease; PCOS, polycystic ovary syndrome, m, male; f, female; OA, osteoarthritis. Cefalu WT, et al. Diabetes Care. 2015.

ADDRESSING UNMET NEEDS IN OSA WITH INCREASED SCREENING

- While OSA affects many adults, it is **underdiagnosed**
 - Symptoms (eg, snoring, insomnia, headaches) are often not recognized as problematic
- Screening for OSA in adults with or without symptoms*
 - Epworth Sleepiness Scale
 - STOP questionnaire (snoring, tiredness, observed apnea, high blood pressure)
 - STOP-Bang questionnaire (STOP questionnaire plus body mass index, age, neck circumference, gender)
 - Berlin Questionnaire
 - Wisconsin Sleep Questionnaire
 - Multivariable Apnea Prediction tool

*The current evidence is insufficient to assess the balance of benefits and harms of screening for OSA in the general adult population

Jin J. Screening for Obstructive Sleep Apnea. JAMA. 2022;328(19):1988. doi:10.1001/jama.2022.20142

If the answers to a screening questionnaire are suggestive of OSA, **a sleep study is typically done as a diagnostic test.**

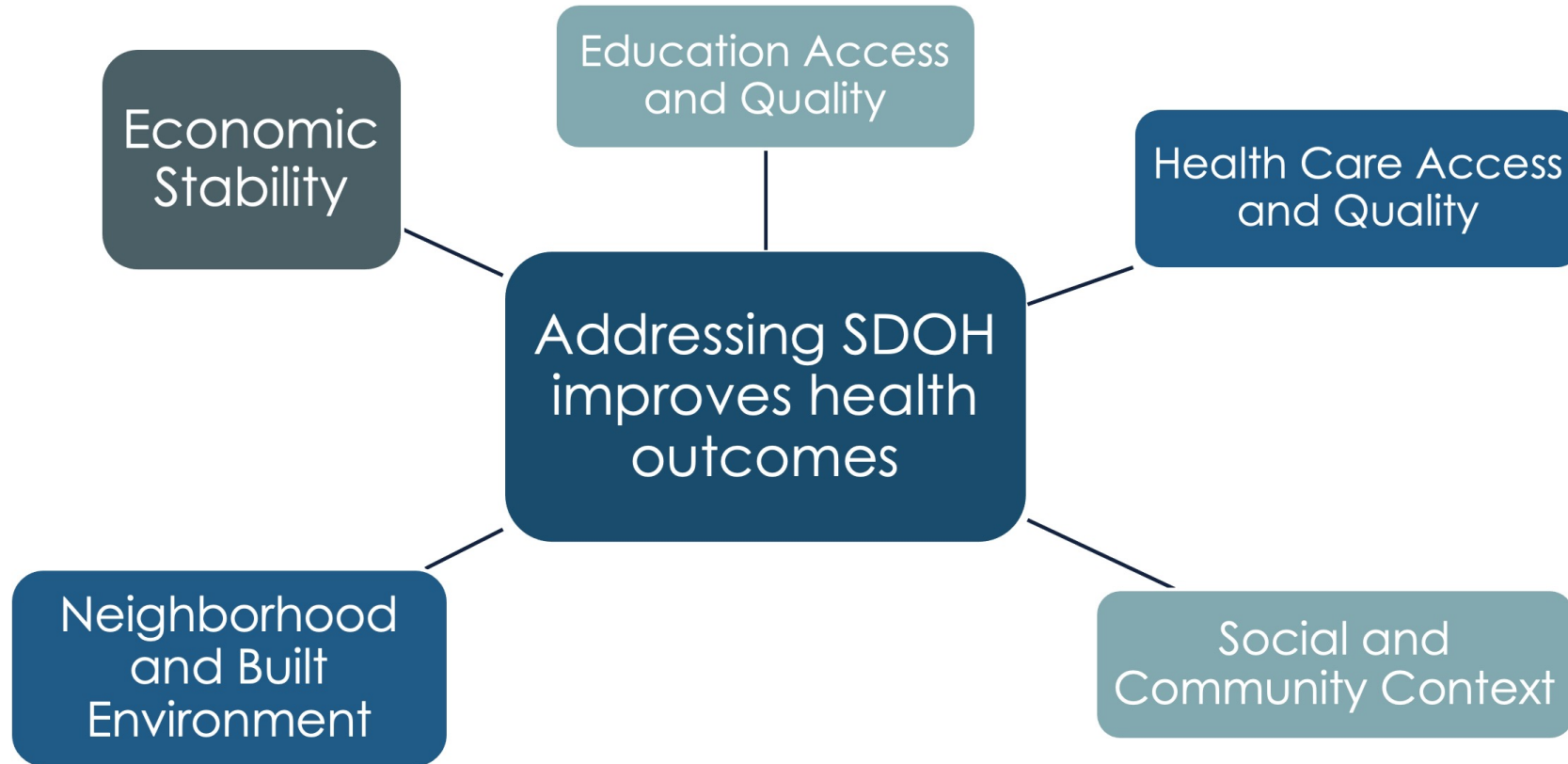


- SNORING
- TIREDNESS/SLEEPINESS/FATIGUE
- OBSERVED APNEA
- PBP (>140/90) RX OR NO



HIGH-RISK AND UNDERSERVED POPULATIONS IN OSA

SOCIAL DETERMINANTS OF HEALTH (SDOH)



Healthy People 2030. <https://health.gov/healthypeople/priority-areas/social-determinants-health>

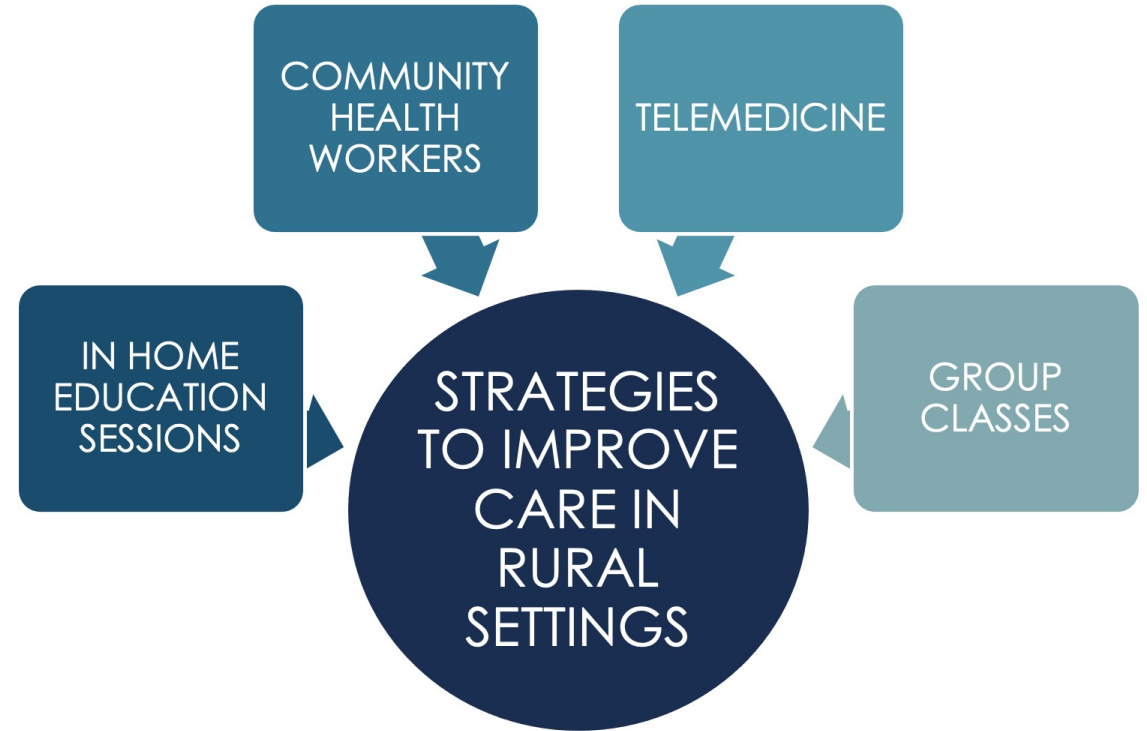
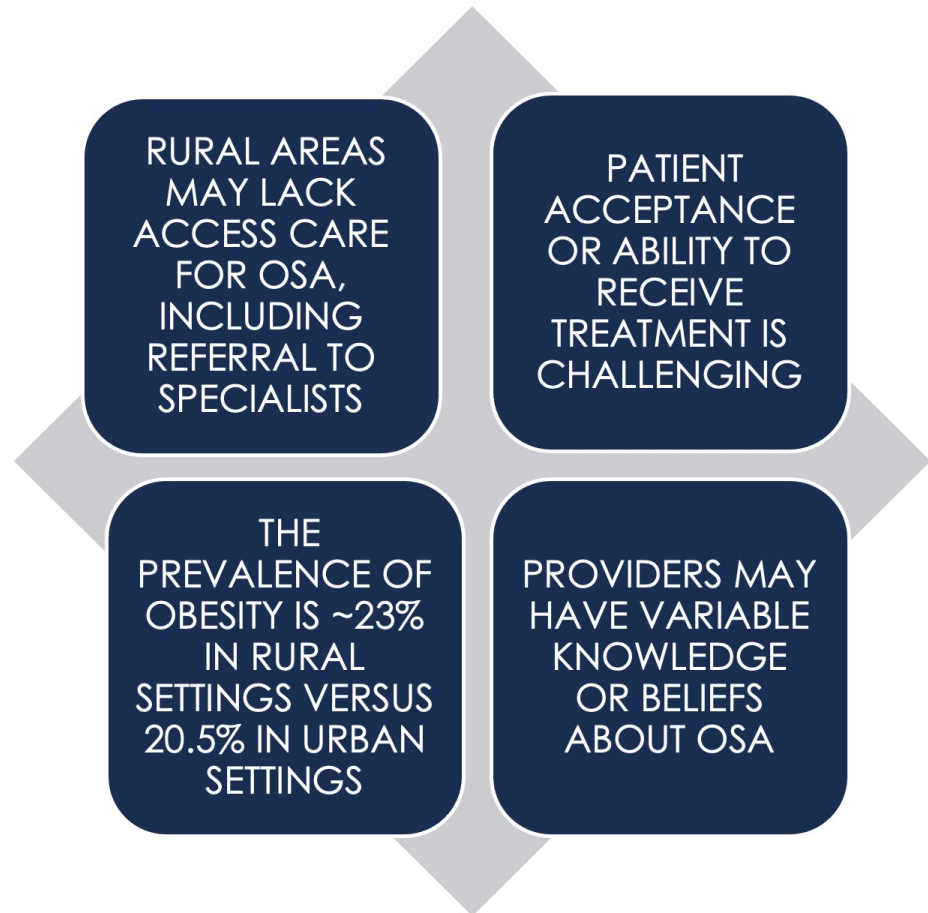
SOCIAL DETERMINANTS OF HEALTH AND OSA

- Influence of SDOHs on OSA patients
 - Barriers across stages of OSA diagnosis and treatment
 - More steps in the process of receiving treatment for OSA carries a risk of patients being lost to follow up and not receiving needed care



Henry, Oet al. (2022). A Model for Sleep Apnea Management in Underserved Patient Populations. Journal of Primary Care & Community Health. 13. 215013192110689.

DIAGNOSING OSA AND COMORBIDITIES IN THE RURAL PRACTICE SETTING



Massey CN et al. *Clin Diabetes* 2010;28(1):20-27.; Lepard MG et al. *Curr Diab Rep.* 2015 Jun; 15(6): 608; Stansbury, RS et al. *J Clin Med.* 2022;11:4449.

RECOMMENDED STRATEGIES FOR OSA DIAGNOSIS AND TREATMENT

Address potential concerns around patient education & working with underserved patient populations

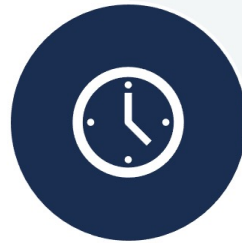
STRATEGIES:



Time effective



Cost effective



STOP-BANG screening questionnaire

- Time-efficient and high sensitivity to patients at risk of moderate to severe sleep apnea



Home sleep test vs in-lab polysomnography

- Cost effectiveness and opportunity for involvement of clinical students



Auto-titrating CPAPs

- Avoids necessity of laboratory-based testing



Telehealth clinic appointments

- Defrayed travel requirements and increased educational opportunities for medical students



CLINICAL QUEST – DIGITAL COIN PIECE 1



<https://mli.link/coin1-ysw>