EVALUATING AND MANAGING OBESITY HYPOVENTELATION SYNDROME

M.FATEH KASHKASH

PHD pulmonary medicine – ALEPPO UNIVESITY HOSPITAL



CLINICAL GUIDELINE

The American Thoracic Society has published a official clinical guideline on the evaluation and management of obesity hypoventilation syndrome in the **American Journal of Respiratory and Critical Care Medicine.**

Definition



Body Mass Index ≥ 30kg/m2

OHS

- → Obesity
- → Sleep-disordered breathing
- → Awake daytime hypercapnia

OHS History

CLINICAL AND PHYSIOLOGICAL ASPECTS OF A CASE OF OBESITY, POLYCYTHEMIA AND ALVEOLAR HYPOVENTILATION

By J. HOWLAND AUCHINCLOSS, Jr., ELLEN COOK, and ATTILIO D. RENZETTI

(From the Department of Medicine, State University of New York, Upstate Medical Center at Syracuse, N. Y.)

1955

- Dypsnea, ankle edema, cyanosis, obesity, hypersomnolence
  - RVH, PHTN, Polycythemia
- Alveolar hypoventilation
  - Hypoxia
  - Hypercarbia
- no lung/chest wall/CNS pathology



Epidemiology

- 0.4-0.6% in general adult population
- Prevalence increases
  - ↑ BMI, up to 50% if BMI>50
  - ↑ severity of OSA



- 10-20% in obese patients with OSA
- 8% in bariatric surgical patients

AUTHORS OF THE GUIDELINE

most patients are

UNDIAGNOSED OR MISDIAGNOSED

jeopardizing their health
and resulting
in increased health care costs.

Pathophysiology

Mechanical Reduced lung volumes and heightened airway resistance

Adipose tissue induce chronic inflammatory state airways edema

Diminished central respiratory drive

Hormonal Leptin resistance, insulin resistance

Cytology Mitochondrial dysfunction

OSAS - OHS

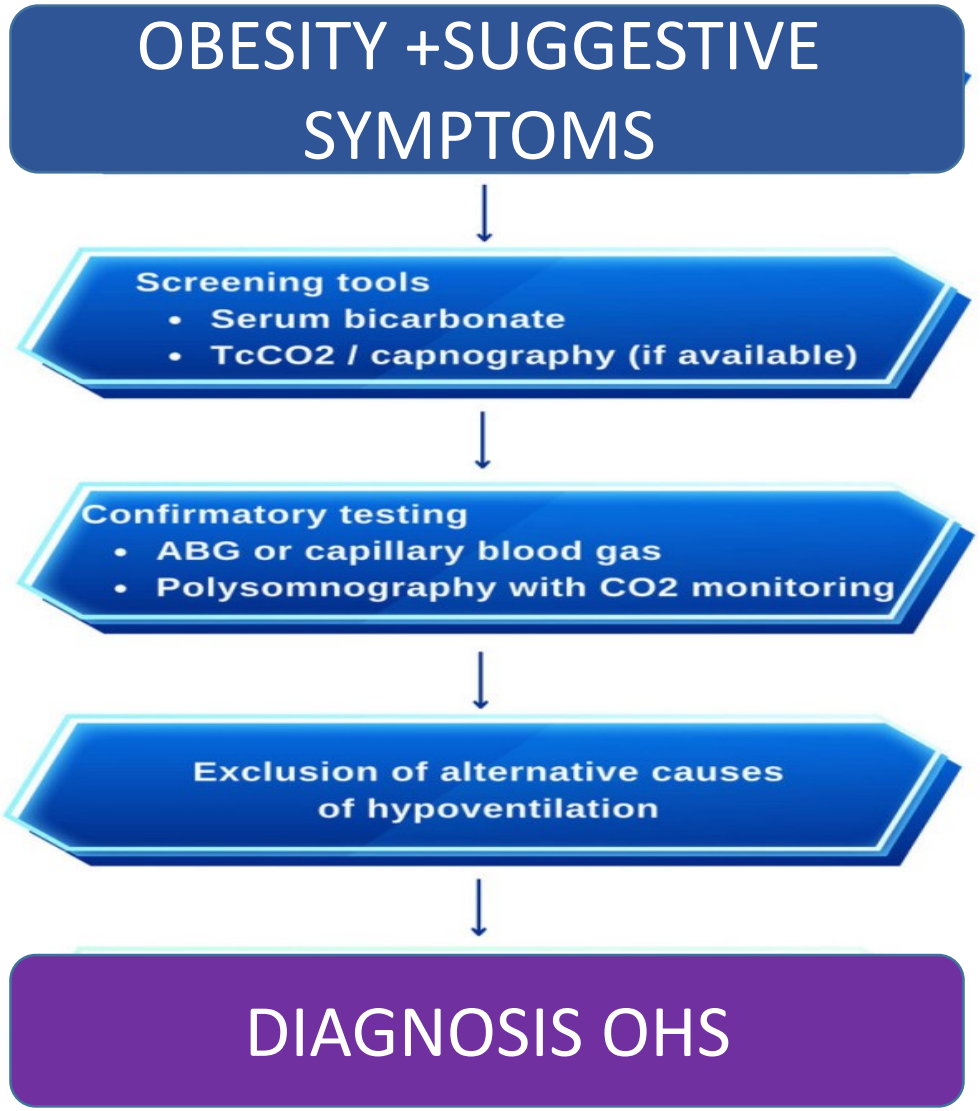
Parameter	OSAS	OHS
Pathophysiology	Recurrent upper-airway obstruction during sleep [2]	Alveolar hypoventilation due to obesity-related mechanical load and impaired ventilatory control [9]
Role of Obesity	Common but not required for diagnosis [2]	Key diagnostic criterion (BMI ≥ 30 kg/m^2 in adults; ≥95th percentile in children) [6,53]
Daytime $PaCO_2$	Typically normal; nocturnal hypercapnia may occur [2,54]	Chronically elevated $PaCO_2$ (>45 mmHg) during wakefulness [6]
Nocturnal Breathing Events	Recurrent apneas and hypopneas with intermittent hypoxemia [2]	May coexist with OSAS or occur independently; persistent nocturnal hypoventilation [9]
Primary Ventilatory Support	CPAP [55]	BiPAP (bilevel PAP) [50,51]
Other Therapeutic Options	Weight loss; adenotonsillectomy or other ear, nose, or throat surgery [2]	Weight reduction (essential component of management) [12]
Underlying Ventilatory Drive	Reduced ventilatory drive [56]	Impaired central ventilatory drive [57]



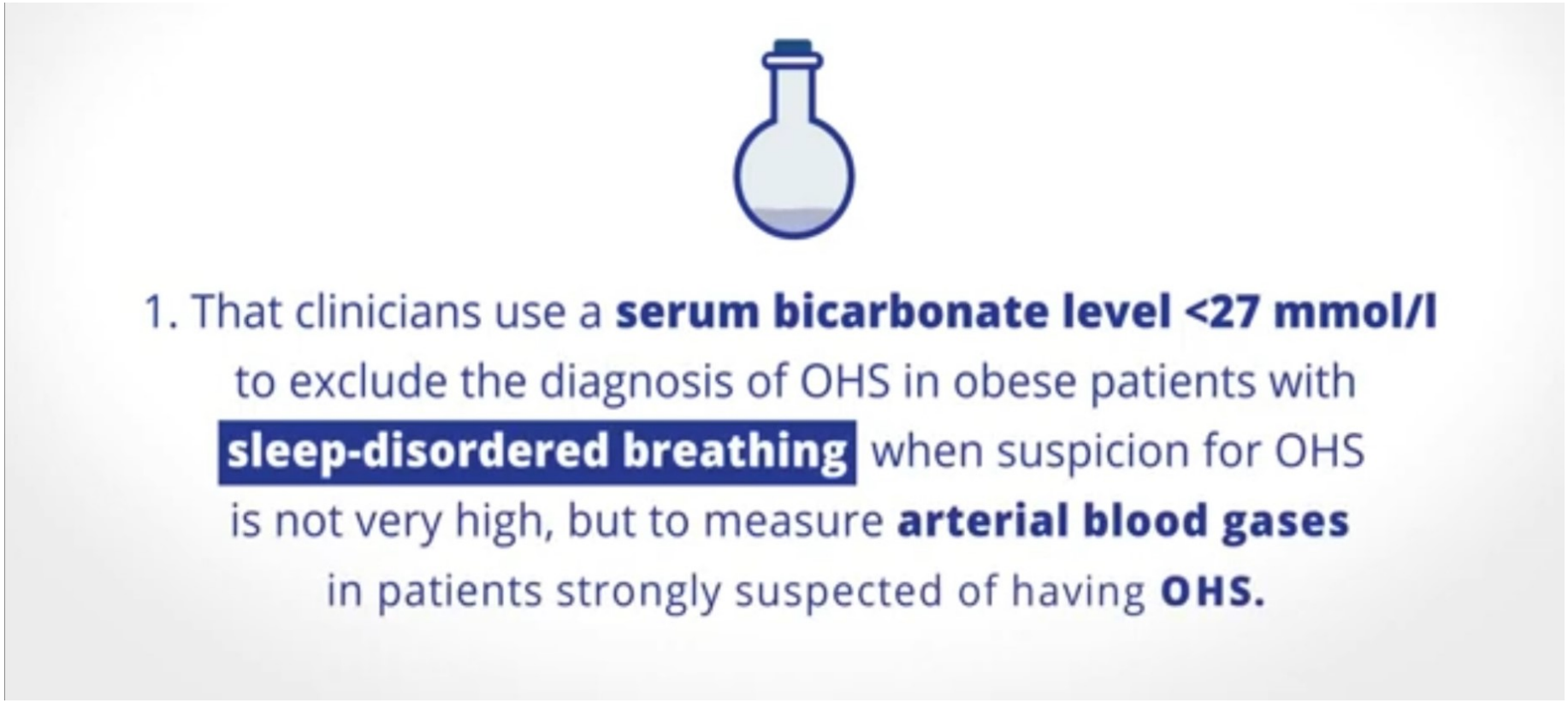
Diagnosis and Evaluation

- High BMI, respiratory difficulty
- The STOP-BANG questionnaire is a screening tool OSA
- Pulmonary function tests (PFTs)
- Arterial blood gas (ABG)
- Polysomnography

DIAGNOSTIC ALGORITHM FOR OHS



Recommendations



A serum bicarbonate of value >27 has a 92% sensitivity for identifying awake hypercapnia in obese individuals.
A serum bicarbonate of value <27 has a negative predictive value of more than 97% for excluding the diagnosis.

Recommendations



2. That stable ambulatory patients with OHS receive positive airway pressure (PAP).

Domiciliary NIV has shown to improve mortality in these patients from 5% to 32%.

First line NIV Positive airway pressure

- CPAP

❑Mild hypercapnia

❑Stable patients

First line NIV Positive airway pressure

- BIPAP

❑PERSISTENT hypercapnia

❑Acute decompensation patients



SEVERE OBESITY

is a **major, modifiable factor** in the development and severity of OHS.

Recommendations



5. That patients with **OHS** use weight-loss interventions that produce sustained weight loss of **25–30 percent** of body weight to achieve resolution of OHS.

(more likely to be obtained with bariatric surgery)

Weight Reduction

- Life style modification
- Pharmacotherapy :GLP! Agonist (semaglutide,tirzepatide)
- Bariatic surgery

❑ BMI>35 kg\m2

❑ BMI>30 kg\m2 with comorbidities



FDA NEWS RELEASE

FDA Approves First Medication for Obstructive Sleep Apnea

For Immediate Release: December 20, 2024

significantly improve moderate-to-severe obstructive sleep apnea (OSA) in adults with obesity by reducing breathing interruptions and promoting weight loss



Tracheostomy

- **Considered as a last resort or in highly complex patients**
- **Limitation :Does not correct underlying hypoventilation unless connected to NIV**



Respiratory stimulants

- Acetazolamide
- Theophylline
- Medroxprogesterone acetate

SLEEP: ORIGINAL RESEARCH · Volume 169, Issue 2, P527-537, February 2026 · Open Access

Download Full Issue

Acetazolamide Plus Atomoxetine for Obesity Hypoventilation Syndrome Treatment

Acute decompensation Hospital Admission

- ETIOLOGY:
- 63% hypoxemic respiratory failure
- 40% acute hypercapnic respiratory failure
- 41% sepsis cases
- 39% cardiac heart failure

Management of **Acute decompensation**

- Non invasive ventilation BIPAP

❑IPAP 12-18 cm H2O

❑EPAP 4-8 cm H2O

❑Back up 10-16 breath \m

❑Fio2 titrate to Spo2 88-92%

Management of **Acute decompensation**

- Adjunctive measures

❑Treat precipitating factor

❑Diuretics

❑Avoid respiratory depressants

❑VTE prophylaxis

Perioperative risks of OHS

- Respiratory failure
- Heart failure
- Prolonged intubation
- Reintubation
- Tracheostomy
- Long ICU
- Death

Pulmonary consultation for Intra operative management

- Regional local anesthesia is preferred .
- Monitor capnography
- Short acting agents
- Non-opioid analgesics
- Minimal dose NMB
- Avoid high flow FiO2 or O2 alone
- Non supine position (semi upright is preferred position)





