

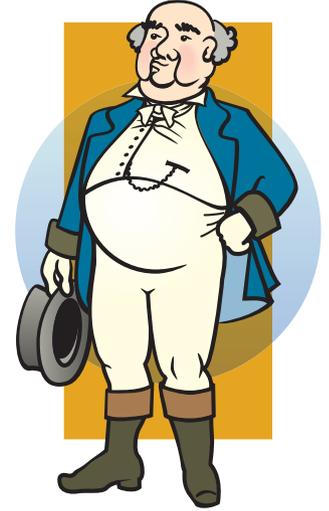


AMERICAN THORACIC SOCIETY

# Patient Information Series

## Obesity Hypoventilation Syndrome

Obesity hypoventilation syndrome (OHS), can be a serious, but treatable, complication of being obese.



### What is Obesity Hypoventilation Syndrome (OHS)?

OHS is a breathing disorder in obese people that leads to low oxygen levels and too much carbon dioxide in your blood. Low oxygen and high carbon dioxide levels may develop because of a condition called hypoventilation during the day (daytime hypoventilation). Hypoventilation means you are not moving enough air in and out of your lungs very well. With OHS, you may also have difficulty sleeping because of obstructive sleep apnea (see ATS Patient Series to read more about *Obstructive Sleep Apnea* at <http://patients.thoracic.org/information-series/index.php>). The three main characteristics of OHS are: 1) obesity; 2) daytime hypoventilation (difficulty getting rid of carbon dioxide); and 3) sleep disordered breathing (such as obstructive sleep apnea). OHS is also referred to as Pickwickian syndrome because persons with OHS may have symptoms like those described by Charles Dickens in his essay, *The Posthumous Papers of the Pickwick Club*.

### What are the symptoms of Obesity Hypoventilation Syndrome?

The symptoms of OHS are usually caused by a lack of sleep and a lower than normal oxygen level in your blood. Symptoms can include daytime sleepiness, lack of energy, breathlessness (see ATS Patient Series on *Breathlessness* at [http://patients.thoracic.org/information-series/en/resources/ATS\\_Patient\\_Ed\\_Breathlessness.pdf](http://patients.thoracic.org/information-series/en/resources/ATS_Patient_Ed_Breathlessness.pdf)), headache and even depression.

Nighttime symptoms include: loud and frequent snoring during sleep and/or breathing pauses. Breathing pauses are when you stop breathing for

short periods of time. These may be concerning to your bed partner. Your bed partner may be the only one who sees or hears your nighttime symptoms.

### Why is it important to know if I have Obesity Hypoventilation Syndrome?

It is important to know if you have OHS because OHS can be treated. If left untreated, OHS is potentially life threatening. When treated, your breathlessness, fatigue, daytime sleepiness, and depression may be reduced or relieved entirely. Treatment could improve your quality of life and decrease your chances of further health issues, including the need to be hospitalized from serious complications of having OHS. If left untreated, the lack of oxygen can put a strain on your heart (see ATS Patient Series on *Obstructive Sleep Apnea and Heart Disease* at <http://patients.thoracic.org/information-series/en/resources/osa.pdf>).

### Do we know what causes Obesity Hypoventilation Syndrome besides obesity?

The cause (or causes) of OHS are not fully understood. OHS may be a combination of your brain's being unable to correctly manage your breathing, your excess fat producing hormones that cause you to breathe ineffectively and the extra weight placed on your chest that makes it much more difficult for you to breathe normally.

### How is Obesity Hypoventilation Syndrome diagnosed?

Your health care provider diagnoses your OHS

PHYSICIANS:  
CLIP  
AND  
COPY

ATS PATIENT INFORMATION SERIES

by taking a complete history of your symptoms, including your sleeping habits, evaluating your body mass index (BMI), measuring your oxygen and carbon dioxide levels, possibly taking a chest x-ray and a sleep study. Your height and weight are used to calculate your BMI. A BMI of 30 or over is considered obese. An online calculator for BMI is available at <http://www.nhlbi.nih.gov/guidelines/obesity/BMI/bmicalc.htm>. Your oxygen and carbon dioxide levels are measured by taking a blood sample from your artery, usually from an artery in your wrist. A pulse oximeter (a sensor lightly attached to the finger) can be used to get an estimate of the amount of oxygen (but not carbon dioxide) in the blood (see ATS Patient Series *Pulse Oximetry* at <http://patients.thoracic.org/information-series/en/resources/ats-patient-ed-pulse-oximetry.pdf>). Pulse oximetry however is not as accurate as a blood sample from your artery.

A chest x-ray may be taken to rule out any other causes of your breathing difficulty. You may be asked to have a sleep study called a polysomnography (see ATS Patient Series on *Sleep Studies* at <http://patients.thoracic.org/information-series/en/resources/sleep-studies.pdf>). The sleep study will determine if you have sleep apnea and what treatment may be needed. Although not necessary to diagnose OHS, a sleep study is usually ordered for patients with OHS to also find out how severe your sleep apnea may be. In addition, a sleep study is done (titration polysomnography) to guide treatment.

**How is Obesity Hypoventilation Syndrome treated?**

Treatment for OHS will include weight loss and treating your breathing disorder. Sometimes, weight loss alone corrects many of the other problems such as obstructive sleep apnea. Therefore, the first approach to treating your OHS is weight loss. Diet, exercise, and good sleep are important to weight loss. Because OHS can cause serious health problems, sometimes surgery is needed (e.g. gastric bypass surgery) to help with your weight loss.

To treat your breathing disorder, you will

probably need positive-airway pressure (PAP) support described in the ATS Patient Series on Obstructive Sleep Apnea in Adults. The types of PAP support include Continuous PAP (CPAP) or Bi-level PAP (BPAP). Both are devices that deliver air to you through a mask that you wear anytime you are sleeping or napping. CPAP delivers air at a constant pressure both when you breathe in and when you breathe out. BPAP on the other hand delivers higher pressures when you are breathing in, than when you are breathing out. When OSA is severe, and not controlled with PAP, a tracheostomy (surgical hole in the neck) may be needed to ensure that your sleep apnea is adequately treated.

Research is being done to find medications to treat OHS. So far, no medications are recommended for the treatment of OHS.

**Authors:** Vidya Krishnan MD, MHS and Pedro Genta MD  
**Reviewers:** Suzanne Lareau RN, MS; Bonnie Fahy, RN, MN, CNS; Atul Malhotra MD

**Rx Action Steps**

- ✓ If you are obese and having symptoms of OHS, discuss this with your health care provider who may refer you to a Sleep Specialist.
- ✓ Weight loss alone may help your OHS, but your breathing pattern while sleeping must also be controlled.
- ✓ If your bed partner notices you have pauses in your breathing, contact your health care provider

**Doctor's Office Telephone:**

---

**Resources:**

**National Institutes of Health:**  
[http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001149/#adam\\_000085.disease.causes](http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001149/#adam_000085.disease.causes)

**Patient.co.uk:**  
<http://www.patient.co.uk/doctor/Pickwickian-Syndrome.htm>