

# Raising Sleep Apnea Awareness: Among People with Diabetes in North Carolina, 2012

NC Diabetes Prevention and Control Program Fact Sheet

**P**eople with diabetes have more sleep problems than people without diabetes in the same age, sex, and race/ethnicity group. Diabetes is associated with a higher risk of sleeping disorders including insomnia, sleep apnea, Restless Legs Syndrome (RLS) and excessive sleepiness. These sleeping disorders are common, serious and under-recognized conditions that can have a negative impact on a person's health and quality of life<sup>1</sup>. Ninety percent of U.S. citizens have some sort of sleeping disorder. People with diabetes may have multiple sleep disorders. Health care providers need to be aware of high prevalence of sleep disorders among people with diabetes and treat them appropriately for this condition. Treatment for sleep apnea can help people manage symptoms of both diseases, thus improving their quality of life.

## What is sleep apnea?

In sleep apnea, breathing stops or gets very shallow. Each pause in breathing typically lasts 10 to 20 seconds or more. These pauses can occur 20 to 30 times or more in an hour. This puts a strain on the body, raising blood pressure and reducing the duration of sleep. Since sleep is interrupted throughout the night, sleep apnea results in poor sleep quality as well as daytime sleepiness. People with sleep apnea are at higher risk for car crashes, work-related accidents and other medical problems. About one in 10 women and one in four men have sleeping disordered breathing although most are unaware of their problem. The rate of sleep apnea in a healthy/fit population is estimated to be approximately 4 to 5 percent.



## There are three kinds of Sleep Apnea.

Type of Sleep Apnea	Prevalence	Main symptom or cause
Central Sleep Apnea	0.4%	Breathing is interrupted by the lack of respiratory effort.
Obstructive Sleep Apnea (OSA)	84%	Airway is blocked by something like tongue, tonsils, or uvula (a piece of flesh in the throat)
Complex Sleep Apnea or ("Mixed")	15%	There is a transition from central to obstructive features during the sleep apnea episodes

## Obstructive Sleep Apnea (OSA)

OSA is the most common type<sup>2</sup>. Nearly nine-out-of-10 people who have sleep apnea have OSA. In OSA, something is blocking the airway that brings air into the body. When one tries to breathe, he/she can't get enough air because of the blockage. The airway might be blocked by tongue, tonsils or uvula (the little piece of flesh that hangs down the back of throat). It might be also blocked by a large amount of fatty tissue in the throat or by relaxed throat muscles.



## Type 2 diabetes and OSA

Recent research shows that the majority of patients with type 2 diabetes have OSA. OSA is also independently associated with alterations in glucose metabolism and places patients at an increased risk of the development of type 2 diabetes. Intermittent oxygen deprivation and reduced sleep duration due to OSA have adverse effects on glucose metabolism.

## OSA Prevalence in the United States

There are 20 million people in the U.S. who have sleep apnea<sup>3</sup>. OSA affects both adults and children. OSA affects approximately 20 percent of the US adults of whom 85 to 90 percent are undiagnosed. OSA is highly prevalent in men. Two-out-of-three men with diabetes who are 65 or older have OSA. According to NHANES 2005-2008 study, the prevalence of sleep apnea was 9 percent. The prevalence of OSA is higher in:

- Asians;
- Hispanic women; and
- African-Americans.



## 1993 Wisconsin Sleep Cohort Study reported that:

- Men had three times more sleep apnea than women (24% vs. 9%)<sup>4</sup>.
- In this same cohort, 4 percent of men and 2 percent of women met “minimal diagnostic criteria” for OSA.
- 44 percent of men and 28 percent of women were habitual snorers.
- Both BMI and age increases the risk of sleep apnea.

Since this study, the U.S. population has aged and become more obese. Therefore, the risk of sleep apnea nationally may have increased significantly.



## OSA prevalence in diabetic Medicaid population in North Carolina

There were 138,464 adults with diabetes who were enrolled in Medicaid in North Carolina in FY 2011<sup>5</sup>. About 12,233 or 6.4 percent of adults with diabetes (18+) were identified with a procedure code for sleep apnea in the state.



Table 1: Sleep Apnea prevalence among people with diabetes (Medicaid population) in North Carolina, FY 2011

ICD-9 Code	Number of people	Number of paid claims
327.23- OSA	11,391	176,301
780.57 – Unspecified Sleep Apnea	2,221	15,985
Total	12,233*	192,286

\*Unduplicated count. If people from both ICD-9 codes are added, some people get counted twice, as they must have each had a claim for both those ICD-9 codes. Source: FY 2011 NC Medicaid data, NC state Center for Health Statistics.

## Hospital Discharge data with sleep Apnea and OSA in North Carolina 2010

There were almost 1.1 million hospital discharges in North Carolina in 2010<sup>6</sup>. Among those discharges, 638,000 were for women and 450,000 were for men.

Table 2: 2010 Hospital Discharges with any diagnosis of Sleep Apnea\*, and OSA by gender, North Carolina

Gender	Sleep Apnea ICD-9 code -780.57	OSA ICD-9 code-327.23
Female	4,324	13,256
Male	4,789	15,031
Total*	9,113	28,289

\*Total includes 61 unknown cases. Note: Hospital Discharge data may give a low estimate of the true prevalence as sleep apnea may not be a billable hospital discharge diagnosis so it might not be reported on the UB-04 discharge billing form on which these files are based.

Table 3: 2010 Diabetes Hospital Discharges (Any Diagnosis) with diagnosis of sleep apnea and OSA by gender, North Carolina

Gender	Sleep Apnea ICD-9 code -780.57	OSA ICD-9 code-327.23	Total diabetes-related discharges	% OSA to total diabetes-related discharges
Female	1,485	5,304	106,694	5.0
Male	1,565	5,547	89,705	6.2
Total*	3,050	10,851	196,405	5.5

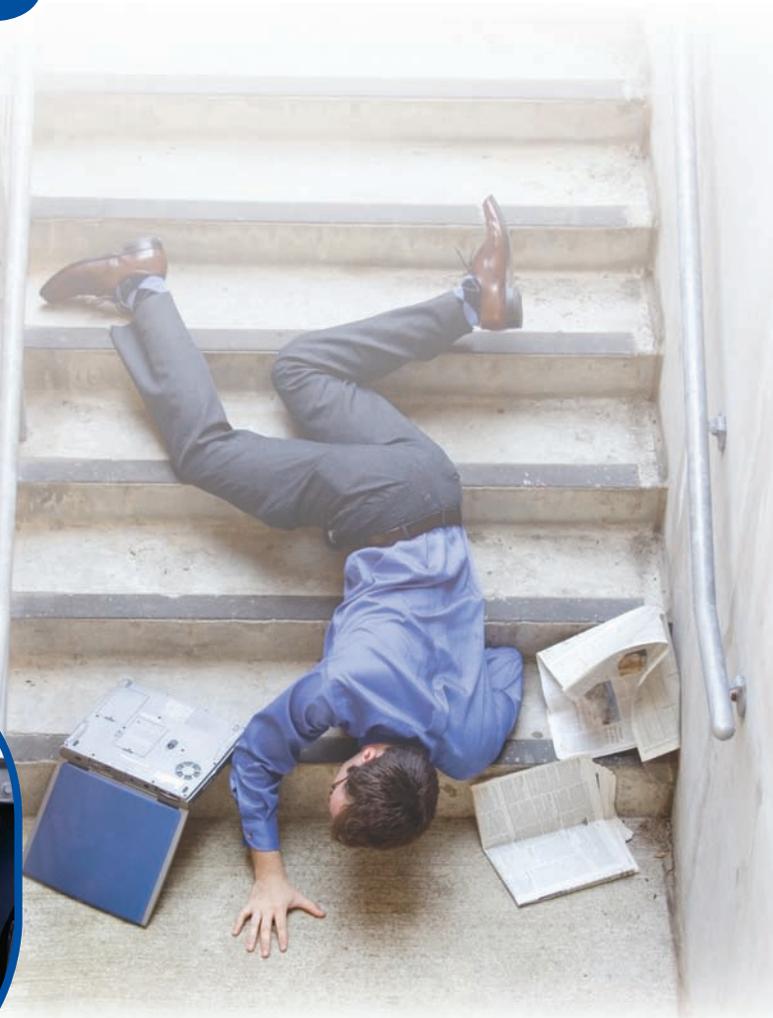
\*Total includes 6 unknown cases. Note: Hospital Discharge data may give a low estimate of the true prevalence as sleep apnea may not be a billable hospital discharge diagnosis so it might not be reported on the UB-04 discharge billing form on which these files are based.

## Symptoms, Risk factors and complications of sleep apnea

Signs and symptoms of sleep apnea	Risk Factors and identifiers for sleep apnea	Complications of untreated sleep apnea
<ul style="list-style-type: none"> <li>• Loud snoring</li> <li>• Difficulty breathing at night (gasping for air)</li> <li>• Insomnia</li> <li>• Excessive daytime sleepiness</li> <li>• Morning headaches</li> <li>• History of refractory depression</li> <li>• Frequent nighttime urination.</li> </ul>	<ul style="list-style-type: none"> <li>• Overweight/obesity (BMI &gt;30 and/or upper body obesity)</li> <li>• Age</li> <li>• Male sex</li> <li>• Crowded airway including large tonsils or adenoids</li> <li>• Abnormalities with the upper airway which may include a small jaw or large tongue</li> <li>• Family history of OSA</li> <li>• Hypertension</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of high blood pressure</li> <li>• Heart failure</li> <li>• Stroke</li> <li>• Motor vehicle accidents</li> <li>• Poor job performance</li> <li>• Impaired cognition</li> <li>• Insomnia</li> <li>• Excessive daytime sleepiness</li> </ul>

## Some important facts about OSA:

- Not everyone who has sleep apnea snores.
- OSA is linked to daytime sleepiness, which can lead to vehicle and work-related accidents.
- 83 percent of people who have drug-resistant hypertension have OSA.
- 76 percent of people who have congestive heart failure (CHF) have OSA.
- About 50 percent of people who have atrial fibrillation have OSA.
- 77 percent of people who are obese have OSA.



## Treatment for Obstructive Sleep Apnea

### Lifestyle modification:

- Weight loss helps overweight/obese patients with OSA.
- Physical Activity – New research shows that exercise helps men with diabetes and OSA<sup>7</sup>.
- Smoking cessation.
- People with OSA can also use special devices to prevent them sleeping on their backs. Sleeping on side helps.
- Elevating the head of the bed helps.

### Continuous Positive Airways Pressure (CPAP)<sup>8</sup>:

- In this treatment, patient wears a special mask over the nose and mouth while sleeping. The mask will keep airway open by adding pressure to the breathing of air. CPAP helps most people with OSA.

### Surgery:

- In very few cases, surgery is necessary to remove tonsils or extra tissue from the throat.

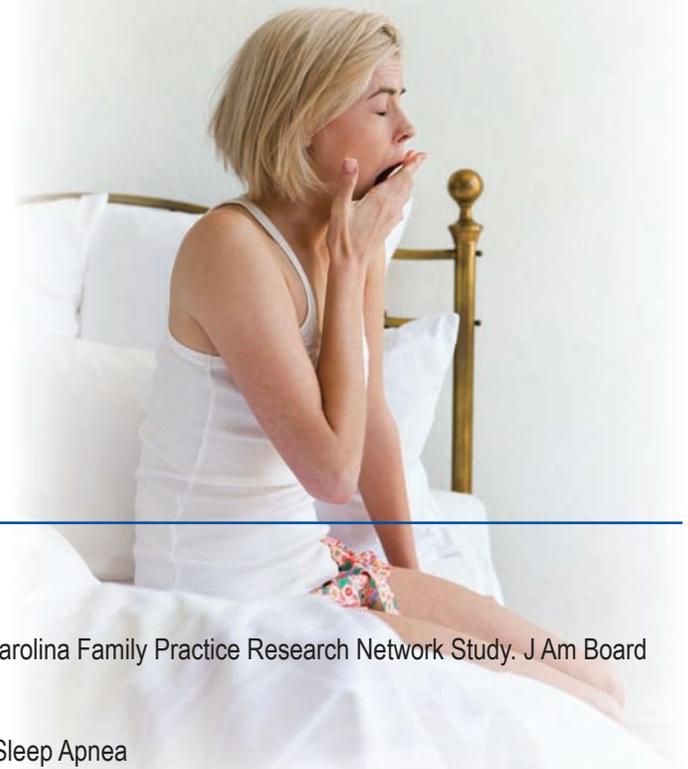


## Cost of Sleep apnea

- The National Commission on Sleep Disorders has estimated that sleep deprivation costs the U.S. \$150 billion every year.
- People with undiagnosed or untreated OSA have twice the healthcare costs than without OSA and 50 percent more physician visits and incurred 50 percent more physician costs. Their hospital stays were longer compared to those without OSA.
- The cost of sleep apnea may be much higher when combined health risks and damaged relationships caused by sleeplessness due to sleep apnea.



- Five ways in which sleep apnea is costing real money:
  - o Excessive daytime sleepiness;
  - o Impaired cognition;
  - o Poor job performance;
  - o Motor vehicle accidents; and,
  - o Increased health care use.



Data sources:

- 1 Maha Alattar, et al., Sleep Problems in Primary Care: A North Carolina Family Practice Research Network Study. J Am Board Fam Med July –Aug 2007 Vol. 20 no. 4 365-374
- 2 Philips Healthcare at [www.philips.com/healthcare](http://www.philips.com/healthcare). Obstructive Sleep Apnea
- 3 Plantinga L, Rao MN, Schillinger D. Prevalence of Self-Reported Sleep Problems Among People with Diabetes in the United States, 2005-2008. Prev Chronic Dis 2012;9:110244.
- 4 Young T. The occurrence of sleep-disordered breathing among middle-aged adults. N. Engl J..Med. 1993 April 29;328 (17):1230-5.
- 5 North Carolina Medicaid data FY 2011, The State Center for Health Statistics.
- 6 North Carolina Hospital Discharge data, 2010, The State Center for Health Statistics.
- 7 News Release from Endocrine society. Exercise helps men battling diabetes and sleep apnea, June 2011
- 8 Butt M, et al “Left ventricular systolic and diastolic function in obstructive sleep apnea: impact of continuous positive airway pressure therapy” Circ Heart Fail 2012;

For more diabetes data, please see **The Burden of Diabetes in North Carolina at:**  
[www.ncdiabetes.org/library/\\_pdf/Diabetes%20Burden%20Bk.pdf](http://www.ncdiabetes.org/library/_pdf/Diabetes%20Burden%20Bk.pdf)



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5/2012