

# Sleep apnea study finds male-female differences in cerebral cortex thickness, symptoms

March 13 2018, by Andrew Porterfield

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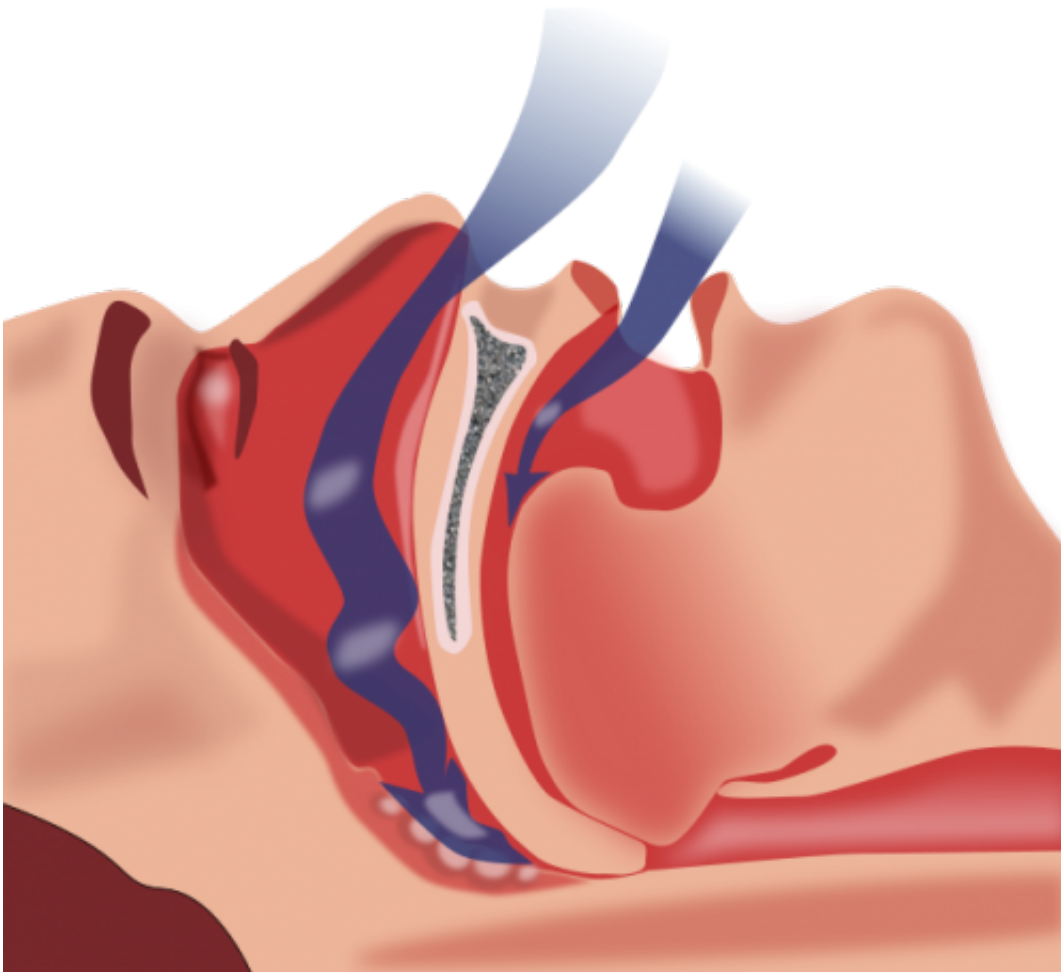


Illustration of obstruction of ventilation. Credit: Habib M'henni / public domain

Researchers from the UCLA School of Nursing examined clinical records and magnetic resonance imaging brain scans of patients who were recently diagnosed with sleep apnea, and discovered several apparent connections between thinning of the brain's cerebral cortex and apnea symptoms. The researchers also could discern distinct changes in brain structures and concurrent symptoms that differed between men and women. For example, more regions of the superior frontal lobe were thinner in women with apnea than men or control groups, which might explain enhanced cognitive deficits among women with the disorder. No sleep apnea patients showed any thickening of the cerebral cortex. In addition, overall cortical thinning could possibly lead to impaired regulation of the autonomic nervous system and associated impaired breathing function through the upper airway in these patients.

Obstructive [sleep apnea](#), which involves disruption of the upper airway, affects about 10 percent of adults. Its cause is unknown. Men are twice as likely to have sleep apnea as women, and symptoms and [brain](#) function appear to vary between men and women. However, while previous studies have made connections between brain structure changes and general clinical signs, none have definitively linked sex differences in brain structure with symptoms in sleep apnea. Left untreated, the impact of sleep apnea on brain damage progresses overtime.

Using high-resolution [magnetic resonance imaging](#) scans, the researchers looked at cortex thickness of 12 women and 36 men who had diagnoses of mild to severe [obstructive sleep apnea](#) (who were not being treated for their condition), and compared those findings to 40 male and 22 female controls (who did not have sleep apnea). The researchers then compared clinical findings of each patient with evidence of cortex thinning.

The study is one of the first to underscore significant clinical differences between men and women with sleep apnea, and points to the need for different treatment approaches to address these varied symptoms. The

greater cortex injury in cognitive centers of women's brains may underlie their more common cognitive problems compared with men, while thinning associated with both men and [women](#) who have sleep apnea may be behind the disordered breathing seen between both. It is not clear whether these physical brain changes precede the sleep apnea disorder, or worsen sleep apnea's symptoms as the disorder progresses.

**More information:** Paul M. Macey et al. Obstructive sleep apnea and cortical thickness in females and males, *PLOS ONE* (2018). [DOI: 10.1371/journal.pone.0193854](#)

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