



# HOKKAIDO UNIVERSITY

|                  |                                                                                                                                         |
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| Title            | 睡眠時無呼吸症候群について                                                                                                                           |
| Author(s)        | 有馬, 太郎                                                                                                                                  |
| Relation         | 自分じゃ気づかない、寝ている間のいびきと歯ぎしり (Dangerous not to know the existence of your sleep bruxism and snoring). 北海道大学歯学部講堂. 2013年9月29日(日) 9:00-12:30. |
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# 睡眠時無呼吸症候群について

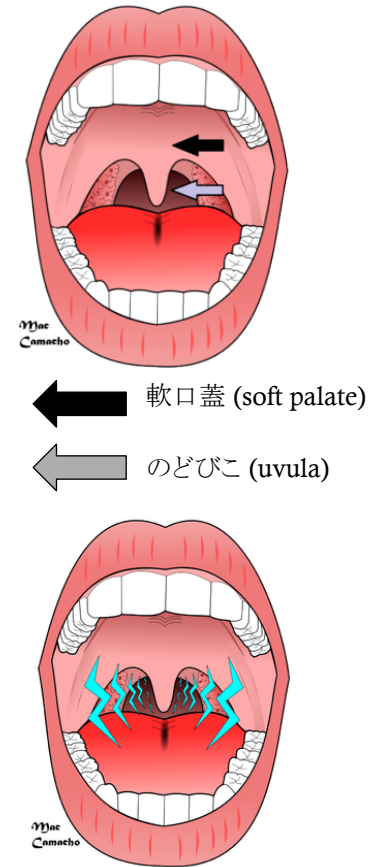
自分じゃ気づかない、寝ている間のいびきと歯ぎしり

サステナビリティウィーク2013

平成25年9月29日

# いびき (Snoring)

はぎしり？ それとも, , , , , ,  
Sleep bruxism? or what?



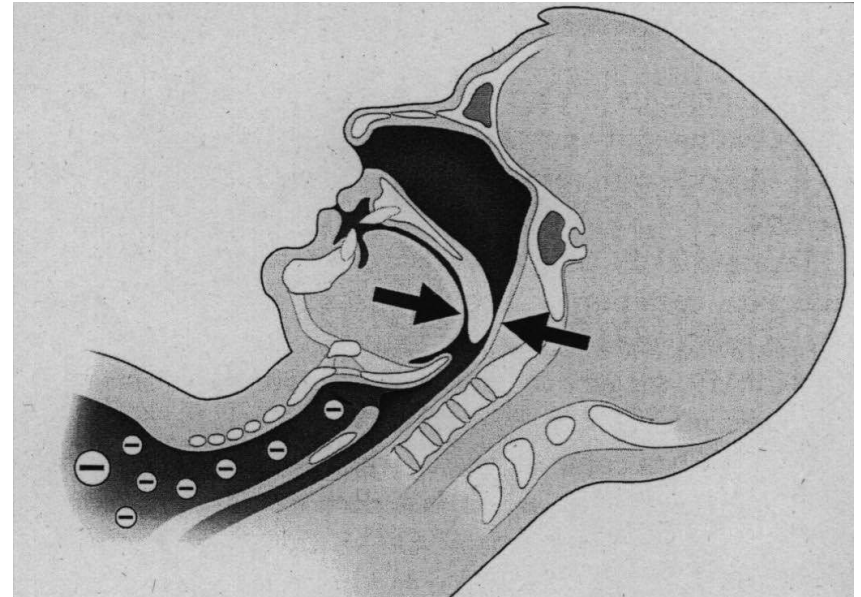
Snoring is the noise made by air as it passes in and out through the upper air passage, making the uvula and soft palate vibrate in the throat. Soparker G 2010

- Soparker G. The quick and easy sleep apnea. P26 2010.

# 睡眠時無呼吸症 (Sleep Apnea Syndrome)

- 睡眠中に呼吸が止まってしまう病気
- 日本ではSAS
- 欧米ではOSA (obstructive sleep apnea) and UARS (upper airway resistance syndrome)
- 罹患率: OSAは人口の2-5%

Bresnits et al 1994,  
Olesen et al 1995,  
Kripke et al 1997.



## [理由]

- SASの90%がOSA
- UARSはまだ未定義(はっきり分かっていない)

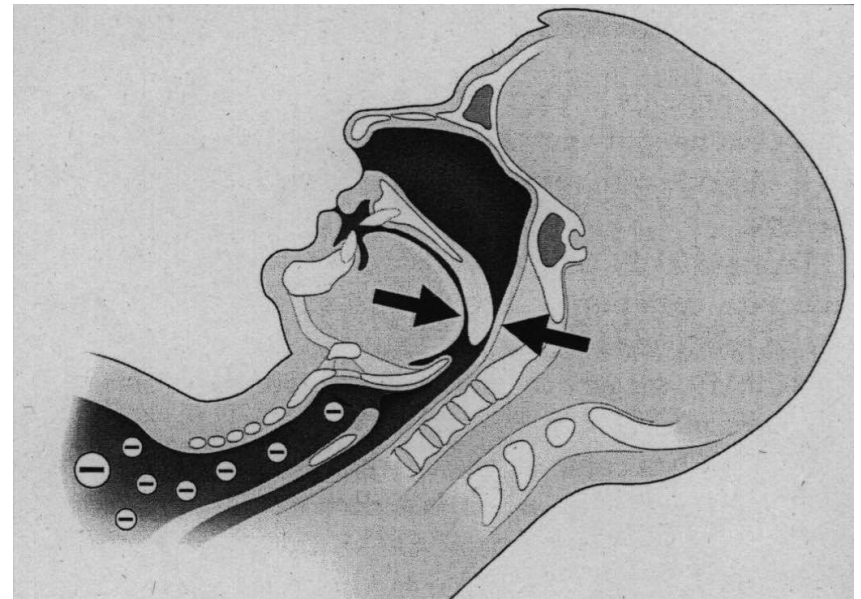
- Bresnits EA et al. Epidemiology of obstructive sleep apnea. Epidemiol Rev 1994;16:210-27.
- Olesen LG et al. A community study of snoring and sleep-disordered breathing. Prevalence. Am J Respir Crit Care Med 1995;152:711-16.
- Kripke DF et al. Prevalence of sleep disordered breathing in ages 40-64 years: a population based surveys. Sleep 1997;20:65-76.

# 睡眠時無呼吸症 (Sleep Apnea Syndrome)

- 睡眠中に呼吸が止まってしまう病気
- 日本ではSAS
- 欧米ではOSA (obstructive sleep apnea) and UARS (upper airway resistance syndrome)
- 罹患率: OSAは人口の2-5%
- 40-60歳代では高齢の方が多い

Ancoli-Israel 1989,  
Bixler et al 1998,  
Young et al 1993.  
Young et al 1993.

- 男性 > 女性



- Ancoli-Israel S. Epidemiology of sleep disorders. Clin Gender Med 1989;5.
- Bixler BO et al. Effects of age on sleep apnea in men: I. Prevalence and severity. Am J Respir Crit Care Med 1998;157:144-48.
- Young T et al. The occurrence of sleep-disordered breathing among middle-aged adults. N Engl J Med 1993;328:1230-35.

# 症状 (Symptoms of OSA and UARS)

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- 何らかの形の睡眠時呼吸障害  
subtypes of sleep-disordered breathing (SDB)

[臨床評価: clinical presentation]

<睡眠に関連した症状: sleep-related symptoms>

## ①いびき: Snoring (70-95% of OSA)

Whyte 1989

- 何年も続く中, 頻度と程度がひどくなる: increased intensity over time
  - + 飲酒: alcohol consumption
  - + 体重の増加: weight gain
  - + 薬の服用(鎮静剤): sedative medications
  - + 睡眠障害: sleep deprivation
  - + あおむけでの睡眠: supine position
- いびきのためにパートナーとの関係が壊れる: relationship could be discorded
- 睡眠時無呼吸患者の46%がパートナーと別室で就寝する: 46% of patients slept in a different room from their partners

Kales 1989

- 
- Whyte KF et al. Clinical features of the sleep apnea/hypopnea syndrome. Q J Med 1989;72:659-66.
  - Kales A et al. Severe obstructive sleep apnea. I: Onset, clinical course, and characteristics. J Chron Dis 1985;38:419-25.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

＜睡眠に関連した症状: sleep-related symptoms＞

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+ 飲酒: alcohol consumption

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+ 睡眠障害: sleep deprivation

+ あおむけでの睡眠: supine position

- あまりにも普通の事: snoring is so common in the general population (35-45% in men, 15-28% in women)

Young 1993

- いびきを自覚していない患者の75%がいびきをしていた: approximately 75% of patients who deny snoring are found to snore

Hoffstein 1994

- 
- Young T et al. The occurrence of sleep-disordered breathing among middle-aged adults. N Engl J Med 1993;328:1230-35.
  - Hoffstein V et al. Snoring: is it in the ear of the beholder? Sleep 1994;17:522-26.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

<睡眠に関連した症状: sleep-related symptoms>

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- + 睡眠障害: sleep deprivation
- + あおむけでの睡眠: supine position

②大きないびきや息切れの後に起きる20-30秒程度の静寂(=無呼吸状態):

one of loud snores or brief gasps alternating with 20- 30-second periods of silence (= witness apnea, 75% of OSA)

Schlosshan 2004

- 偶発的な無呼吸状態はよく起こる: occasional apnea is normal

- 
- Schlosshan D et al. Clinical presentation and diagnosis of the obstructive sleep apnea hypopnea syndrome. Thorax 2004;59:347-52.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

＜睡眠に関連した症状: sleep-related symptoms＞

③睡眠時呼吸困難: nocturnal dyspnea (18-31% of OSA)

Kales 1985

Maislin 1995

Coverdale 1980

- 睡眠覚醒と共に発生, パニックや心配感情と関連し, 数秒でおさまる:  
occurs with arousal; associates with feelings of panic and anxiety; and subside within a few seconds

④よだれ: drooling (1/3 of OSA)

Kales 1985

⑤口腔乾燥: dry mouth (3/4 of OSA)

Kales 1985

- 
- Kales A et al. Severe obstructive sleep apnea. I: Onset, clinical course, and characteristics. J Chron Dis 1985;38:419-25.
  - Maislin G et al. A survey screen for prediction of apnea. Sleep 1995;18:158-66.
  - Coverdale SG et al. The importance of suspecting sleep apnoea as a common cause of excessive daytime sleepiness: further experience from the diagnosis and management of 19 patients. Aust NZ J Med 1980;10:284-88.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

<睡眠に関連した症状: sleep-related symptoms>

⑥睡眠ブラキシズム: sleep bruxism (odds ratio 1.8) Ohayon 2001

⑦寝付きが悪い: restless sleep

- 睡眠中の発汗: nocturnal sweating (up to half of OSA) Maislin 1995

Coverdale 1980

⑧胃食道逆流: gastroesophageal reflux (64-73% of OSA) Valipour 2002

Wise 2006

- 
- Ohayon MM et al Risk factors for sleep bruxism in the general population. Chest 2001;119:53-61.
  - Maislin G et al. A survey screen for prediction of apnea. Sleep 1995;18:158-66.
  - Coverdale SG et al. The importance of suspecting sleep apnoea as a common cause of excessive daytime sleepiness: further experience from the diagnosis and management of 19 patients. Aust NZ J Med 1980;10:284-88.
  - Valipour A et al. Symptomatic gastroesophageal reflux in subjects with a breathing sleep disorder. Chest 2002;121:1748-53.
  - Wise SK et al. Gastroesophageal reflux and laryngopharyngeal reflux in patients with sleep-disordered breathing. Otolaryngol Head Neck Surg 2006;135:253-57.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

<睡眠に関連した症状: sleep-related symptoms>

⑨夜間頻尿: nocturia (28% of OSA, 4-7 times per night)

Hajduk 2003

- 
- Hajduk IA et al. Prevalence and predictors of nocturia in obstructive sleep apnea-hypopnea syndrome - a retrospective study. Sleep 2003;26:61-4.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

< 日中の症状: daytime symptoms > - less specific

① 日中の過剰な眠気 (EDS: excessive daytime sleepiness)

Hoffstein 1993

Kales 1985

Maislin 1995

- 全体でも中度から高度の眠気: the general population also report moderate to severe sleepiness (30-50%)

Young 1993

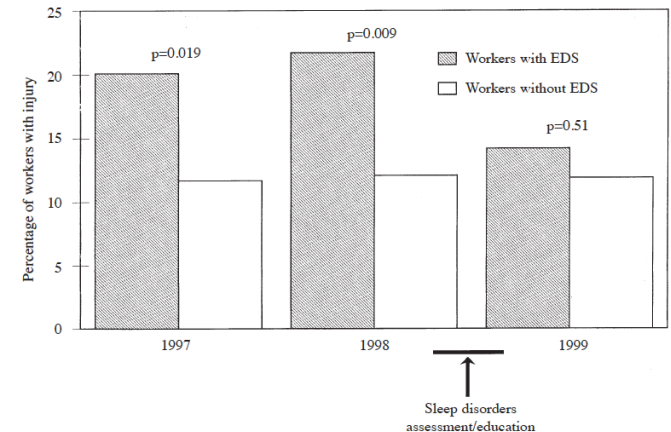
Duran 2001

- EDSにより重大な事故が発生することがある

- 
- Hoffstein V et al. Predictive value of clinical features in diagnosing obstructive sleep apnea. Sleep 1993;16:118-22.
  - Kales A et al. Severe obstructive sleep apnea. I: Onset, clinical course, and characteristics. J Chron Dis 1985;38:419-25.
  - Maislin G et al. A survey screen for prediction of apnea. Sleep 1995;18:158-66.
  - Young T et al. The occurrence of sleep-disordered breathing among middle-aged adults. N Engl J Med 1993;328:1230-35.
  - Duran et al. Obstructive sleep apnea hypopnea and related clinical features in a population-based sample of subjects aged 30 to 70yr. Am J Respir Crit Care Med 2001;163:685-89.

# OSAが原因と思われる事故 (accidents caused by OSA)

- 1986 スペースシャトル「チャレンジャー号」
- 2003 名古屋鉄道新岐阜駅で電車がホーム端の車止めに衝突
- 2003 山陽新幹線岡山駅で電車が停止ラインの100 m手前で停止 (8分間=26km) の居眠り
- 2004 羽田発山口宇部行の全日空航空機で機長が居眠り
- 2005 名神高速道路で多重衝突事故 (7人死亡)



Melamed 2002

- Melamed S et al. Excessive daytime sleepiness and risk of occupational injuries in non-shift daytime workers. Sleep 2002;25:315-22.

# 症状 (Symptoms of OSA and UARS)

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[臨床評価: clinical presentation]

< 日中の症状: daytime symptoms > - less specific

②起床時の頭痛: morning headache (about a half of OSA)

- 起床後一時間から二時間残る: lasts 1 to 2 hours
- 鎮痛剤が必要かもしれない: may need analgesics

AASM 2001, Kales 1985

③神経認知的な問題: neurocognitive impairment

- 記憶力の減退: diminished memory maybe due to hypoxemia

④感情や人格への悪影響: mood and personality changes

⑤性的不能: sexual dysfunction

- 
- American Academy of Sleep Medicine. Obstructive sleep apnea syndrome. In: The International Classification of Sleep Disorders Revised Diagnostic and Coding Manual. 2001; pp. 52-58.
  - Kales A et al. Severe obstructive sleep apnea. I: Onset, clinical course, and characteristics. J Chron Dis 1985;38:419-25.

# いびきと睡眠時無呼吸の割合 (Proportion of OSA)

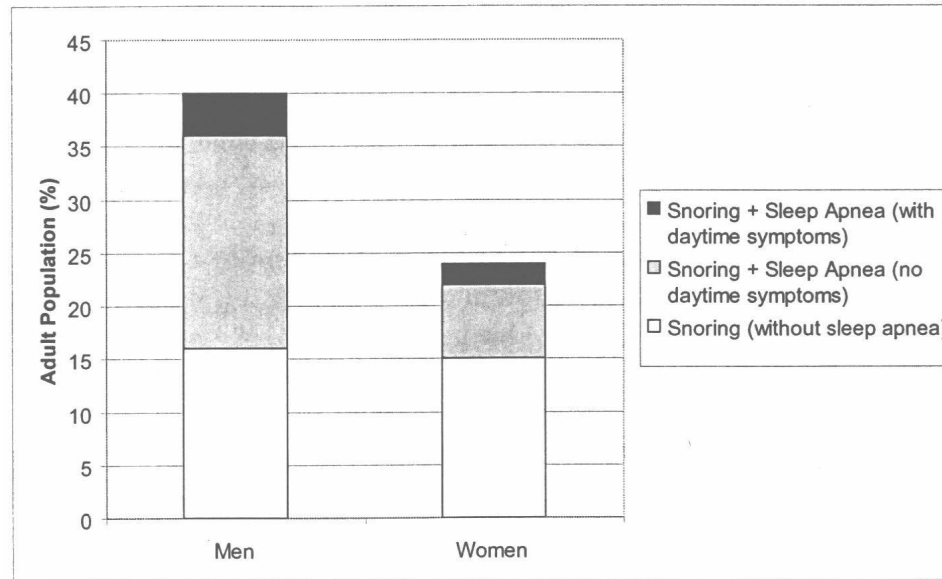


Figure 2. Snoring and sleep apnea in men and women

- Soparkar G. The quick and easy sleep apnea book. 2010; pp. 29.

# 合併症 (Complications with OSA and UARS)

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|                     |                |
|---------------------|----------------|
| ①高血压: hypertension  | Sjostrom 2002  |
| ②心疾患: heart disease | Gami 2007      |
| ③脳卒中: stroke        | Jaggi 2005     |
| ④糖尿病: diabetes      | Reichmuth 2005 |

- 
- Sjostrom C et al. Prevalence of sleep apnoea and snoring in hypertensive men: a population based study. Thorax 2002;57(7):602-7.
  - Gami AS et al. Obstructive sleep apnea, obesity, and the risk of incident atrial fibrillation. J Am Coll Cardiol 2007;49(5):565-71.
  - Jaggi HK et al. Obstructive sleep apnea as a risk factor for stroke and death. N Engl J Med 2005;353(19):2034-41.
  - Reichmuth KJ et al. Association of sleep apnea and type II diabetes: a population-based study. Am J Respir Crit Care Med 2005;172(12):1590-5.

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<睡眠に関連した症状: sleep-related symptoms>

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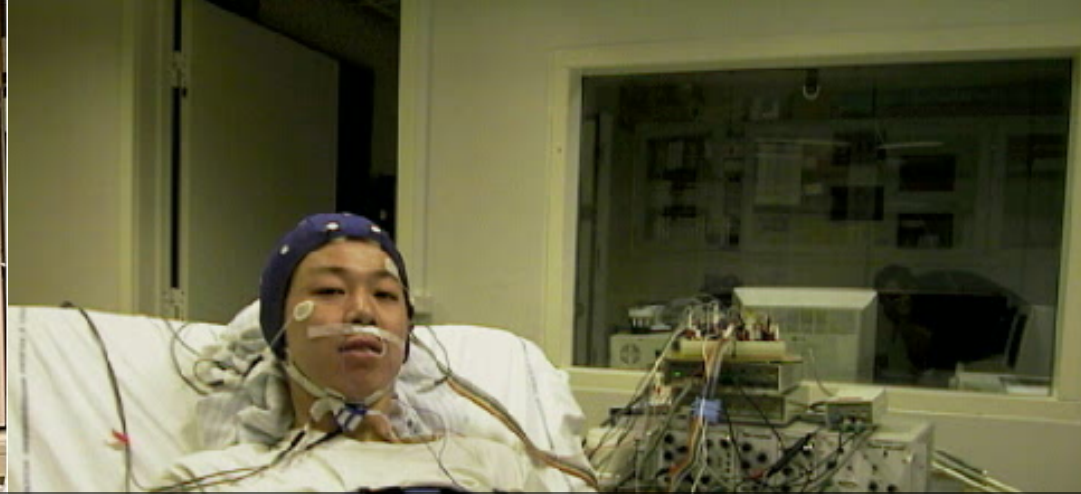
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### Polysomnographic recordings

EEG

Fp1-M2

C3-M2

O1-M2

Fp2-M1

C4-M1

O2-M1

EMG

Sub-mental

EOG

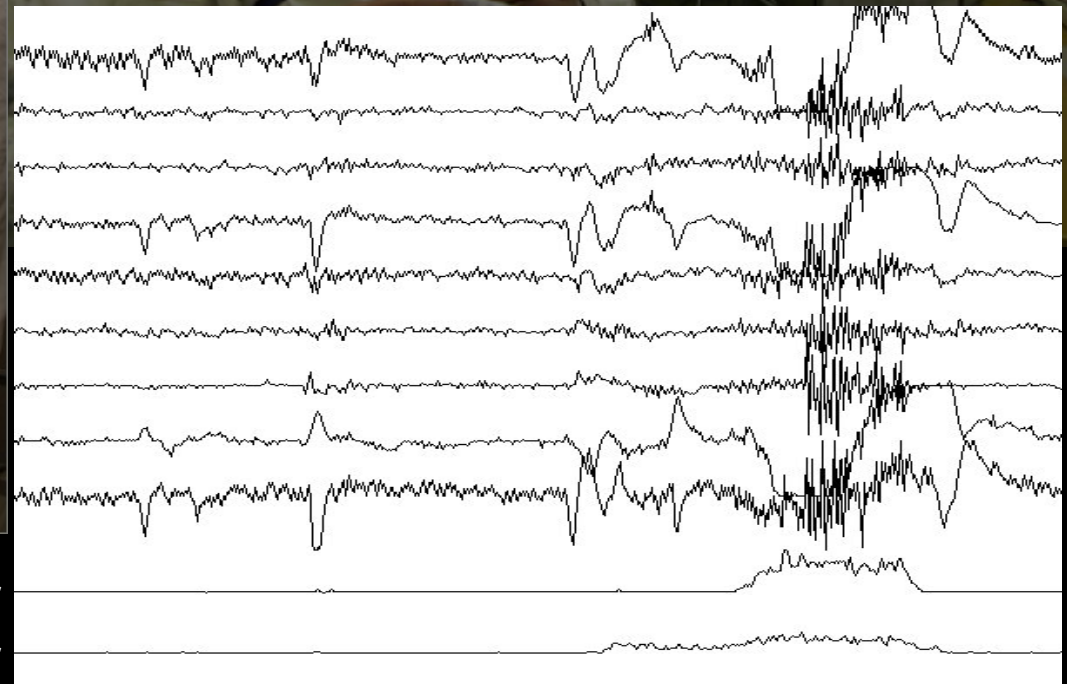
Lt. Eye-M1

Rt. Eye-M1

EMG

Lt. Masseter

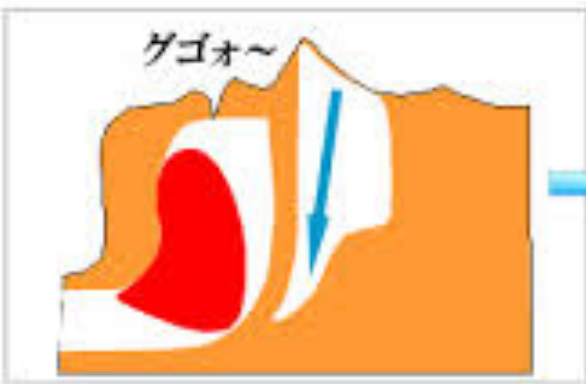
Rt. Masseter



1 second

MVOF

いびきをかいている状態



肥満などが原因で、大きくなった舌が気道をふさいでしまい、呼吸が妨げられています。

スリープスプリント装着時



舌を持ち上げ気道を広げるので、呼吸がしやすくなり、いびきをかかなくなります。



特許出願中

推奨：池松武之亮いびき研究所

21回用

鼻呼吸を促す口閉じテープ

**ストップ!**  
**鼻呼吸で健康!!**

**ネルネル**

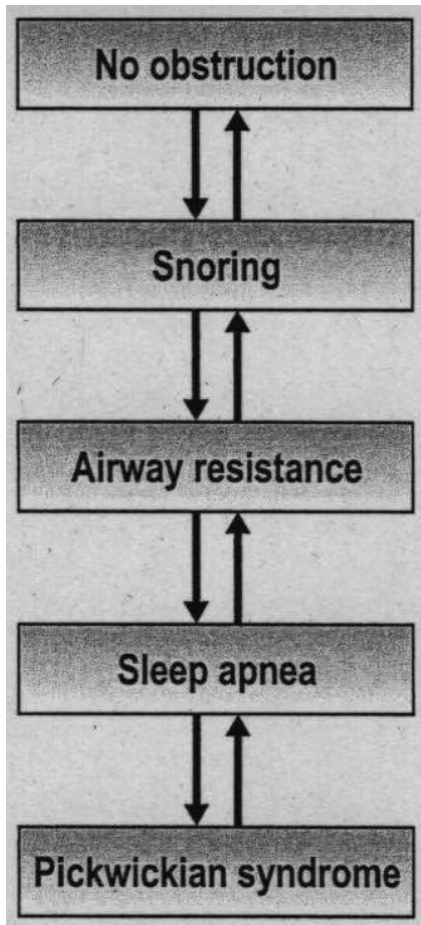
いびき・ノドの乾きの人の80%超が口呼吸

簡単 安心

就寝時の開口呼吸群（口で呼吸する）に多い、いびき・ノドの乾き・起床時のノドのガラガラ〜等を防ぎ、鼻で正しく呼吸する習慣をつけるマウスステップです。

# 診断基準と治療方針

## (Decision making and treatment algorithm)



[AHI: apnea and hypopnea index]

- AHI values are typically categorized as
  - 5–15/hr = mild
  - 15–30/hr = moderate
  - > 30/h = severe