Words Matter: A Proposed Nosologic Lexicon for Sleep Breathing

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When things newly discovered demand terms newly framed to express them clearly, there is no objection to the coinage of words, provided that the process is carried out with judgment and taste. Words of recent fabrication always find ready acceptance when they are built out of Greek material.

—Horace, The Art of Poetry

HUMANS EXPRESS CONCEPTS IN WORDS. THUS, ADVANCES IN SCIENCE REQUIRE PARALLEL ADVANCES IN LANGUAGE. WHEN SCIENTIFIC ADVANCEMENT is rapid, however, language may struggle to keep up. Today, 40 years after the “discovery” of obstructive sleep apnea (OSA), the language related to disorders of sleep breathing lags the accumulated knowledge of those disorders. As a result, sleep medicine as a field may suffer because of shortcomings in its language, just when interest in sleep is expanding beyond its usual subspecialty confines.

The nosologic lexicon related to sleep breathing is particularly problematic. A lexicon is “the special vocabulary of a person, a branch of knowledge, a profession, etc.” It is distinct from “nomenclature,” which refers to the classification of disease, often in a taxonomy. The “nosologic lexicon,” therefore, is the set of terms describing disease entities.

Below, I illustrate the complexity, idiosyncrasy, and inconsistency of sleep breathing’s current nosologic lexicon. A new lexicon, without these problems, is then proposed.

Problems

The complexity of the current lexicon is shown in the Figure. Compiled from multiple sources, it identifies 24 names for 11 nosologic entities in 5 taxonomic levels. Not all terms encountered are shown. Many entities have multiple names, long names, and/or similar names. Challenges to the figure support claims that the lexicon is unsystematic and complex.

This complexity obscures a central concept of obstructive sleep breathing: the spectrum of severity ranging from isolated snoring to severe OSA. Tellingly, a leading sleep medicine textbook contains 8 consecutive chapters, the titles of which use 7 different names for obstructive sleep breathing disease entities.

Idiosyncratic terms mean something different in sleep medicine than in the rest of medicine. For example, the definition of “apnea” in sleep medicine research permits airflow, whereas the definition used in general medicine does not. “Primary” in “primary snoring” is idiosyncratic because it refers to 1 tail of the severity spectrum of obstructive sleep breathing. Normally, “primary” specifies a disease entity, the etiology of which differs from related disorders, as in “primary pulmonary hypertension.”

Inconsistent terms have more than 1 meaning within sleep medicine. “Apnea” is inconsistent because a patient with no apneas may be diagnosed with “obstructive sleep apnea” (when hypopneas are frequent) and because a patient having fewer than 5 apneas per hour may be labeled “nonapneic.” The term “upper airway resistance syndrome” is inconsistent because upper airway resistance is also increased in OSA.

The worst word in sleep medicine, however, is “syndrome.” When used in “OSA syndrome,” it indicates the presence of symptoms—a highly idiosyncratic meaning. “Syndrome” normally means a nonspecific collection of findings.

The distinction between OSA and OSA syndrome is significant. In American adults, the prevalence of the former is about 20% and, of the latter, about 3%. Determining which carries the greater public health burden has profound implications for funding and for patient care and is a signal challenge in sleep medicine.

Yet, confusion between OSA and OSA syndrome is pervasive, occurring in writings by sleep medicine illuminati, in journals of the American Academy of Sleep Medicine, and even in the paragon of evidence-based medicine: a Cochrane review.

Moreover, the definition of OSA syndrome is inconsistent. The American Academy of Pediatrics defines it without reference to symptoms. A recent definition of OSA (sans syndrome) includes symptoms. Finally, the definition of “symptomatic” is so variable that some authorities believe a rigorous definition is impossible.

That so much depends on so difficult a term is worrisome. A complex, idiosyncratic, and inconsistent lexicon increases the learning curve for novitiates; provides fertile ground for miscommunication; promotes tortured writing; and places extra burdens on sleep physicians to be extraordinarily clear in their clinical notes to referring physicians.

Proposal

The proposed new lexicon could be implemented in 3 stages.

1. Eliminate the use of “OSA syndrome.” This term is actively hurting sleep medicine and should be replaced immediately with “symptomatic OSA.”

2. Introduce broad terms. The new lexicon proposes a single word for sleep breathing—“hypnea”—from the Greek

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Dr. Sotos is employed by Apneos Corporation, a business that is involved in developing medical devices for sleep physicians.

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hypnos (“sleep,” as in hypnotic) and pnea (“breathe,” as in apnea). The familiar prefixes eu and dys denote normal and abnormal sleep breathing, respectively. Thus, “dyshypnea” broadly and simply includes any abnormality of sleep breathing. The borderline between dyshypnea and euhypnea will likely change over time, similar to the shifting border between hypertension and normotension.

The proposed lexicon divides dyshypnea into central, obstructive, and uncategorized subtypes. Obstructive dyshypnea is “stenohypnea,” derived from the Greek steno (“narrow,” as in stenosis).3

Whether separation of obstructive and central dyshypnea endures as evidence of their intertwinement accumulates25 primarily concerns nosologists, not lexicographers. The lexicon overlays the nosology. Words describing normal, abnormal, and obstructive sleep breathing will always be necessary.

Importantly, the words “dyshypnea” and “stenohypnea” permit elegant descriptions of “the seemingly countless disease interactions [being] discovered between sleep disorders and diverse medical conditions.”26 For example, the transparent meanings of “dyshypneagenic hypersomnolence,” “stenohypnic hypertension,” and “post-anesthesia stenohypnea” may facilitate discussion, education, and investigation of these syndromes and simultaneously highlight the protean nature of sleep breathing disorders.

3. Define severity scales. The proposed lexicon represents the spectrum of stenohypnea with 1 or more seminumerical clinimetric scales.27 Medicine frequently uses such scales, e.g., the TNM scale of oncology. Stenohypnea scales should be named, dated (because they will evolve), consensus generated, and—ultimately—evidence based.

To facilitate adoption, the first scale should largely correspond with current airflow-defined syndromes of stenohypnea. The “flow2006” scale proposes 6 levels of stenohypnea, in an easily remembered alphabetic progression of severity:

- **Acoustic stenohypnea (ASH)** is snoring, without higher-grade stenohypnea on objective testing.
- **Borderline stenohypnea (BSH)** is objectively abnormal air-
flow or pressure dynamics, but not compensated stenohypnea or higher.28,29

• **Compensated stenohypnea (CSH)** is upper airway resistance syndrome, in which compensatory mechanisms (eg, greater inspiratory effort) preserve airflow volumes.

• **Decompensated stenohypnea (DSH)** is OSA with an apnea-hypopnea index from 5 to 30 per hour.

• **Extreme stenohypnea (ESH)** is OSA with an apnea-hypopnea index greater than 30 per hour.8

• **Fastigious stenohypnea (FSH)** is OSA plus hypercapnia. (“Fastigious” means the aeme of a disease.1)

Additional scales may prove to be useful, e.g., based on symptoms, circulatory consequences, or emerging concepts such as critical airway pressure.28 Absent a symptom scale, “symptomatic” or “asymptomatic” should precede syndrome names.

The proposed lexicon discards existing terms. Ingrained habits of use strongly suggest the current lexicon could not be rehabilitated even if existing terms were clearly defined. “Sleep apnea” may usefully remain in the public's lexicon, as “heart attack” does. Patients may more reliably recall their diagnosis of “level B sleep apnea” than describe an abnormal polysomnogram that did not lead to treatment.

**CONCLUSION**

The best, and perhaps only, reason to modify the current sleep breathing lexicon is to improve the health of populations and patients. Few would disagree that improving communication between physicians (and other parties) will reduce misunderstandings, facilitate research, and lead to more rational public policy. If one accepts that these outcomes are possible with a revised lexicon, then habit, comfort, and familiarity are insufficient reasons to preserve the current lexicon. The longer we wait, the more difficult the change will become.

**REFERENCES**


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