Sweet Dreams: How Sleep and Sleep Disturbances Affect Glycemic Control in People With Diabetes

Laurie Quinn and Cynthia Fritschi, Guest Editors

*Sleep that knits up the
ravelled sleeve of care
The death of each day's life,
sore labour's bath
Balm of hurt minds, great
nature's second course,
Chief nourisher in life's feast.*

—William Shakespeare,
“Macbeth”

One-third of our lives is spent sleeping. Nightly sleep is restorative, allowing our bodies and minds to rest and ready ourselves for a new day. For many people, sleep is often fragmented, and a full night of sound sleep is unattainable. Increasingly, people are seeking care for sleep problems, including insomnia, restless sleep, or daytime symptoms associated with disturbed sleep. Unfortunately, many people are unaware of the impact of disturbed sleep on overall health, and routine assessment of sleep disturbances should be a priority area of clinical assessment.

People with diabetes are especially vulnerable to sleep disturbances such as insomnia, poor sleep quality, and sleep apnea. There is burgeoning research examining the interrelationships among sleep, altered glucose metabolism, and diabetes. Our understanding of the neurological, hormonal, and behavioral effects of altered sleep continues to grow as more complex findings emerge about sleep in the context of both health and disease.

We are honored to serve as the guest editors of this timely Diabetes

Spectrum From Research to Practice section. This special research section is devoted to the topic of sleep and diabetes in adults and children with diabetes.

Four articles are included in this section. In the first, titled “Physiology of Sleep” (p. 5), David W. Carley and Sarah S. Farabi provide a cogent review of the basic anatomy and physiology of sleep. The authors explore how sleep and wake states are initiated and maintained, summarize behavioral and objective methods for measuring and quantifying sleep, and provide an overview of laboratory and home polysomnography testing. Finally, the authors provide the necessary background for the subsequent articles by introducing the interrelationships among endocrine hormones and metabolism, particularly glucose homeostasis, in sleep and wake states.

This and each of the subsequent articles clearly highlight the need for more research examining the role of sleep disturbances in states of altered glucose metabolism, especially with regard to type 1 diabetes. People with type 1 diabetes are vulnerable to sleep disturbances from both physiological and behavioral aspects of diabetes and its treatment. However, there has been limited research exploring sleep-related issues in this population. In our second article, “Type 1 Diabetes and Sleep” (p. 10), Sarah S. Farabi examines current knowledge on the role of sleep-related disturbances/disorders on metabolic alterations of type 1 diabetes and

University of Illinois College of Nursing,
Chicago, IL

Correspondence: Laurie Quinn,
lquinn1@uic.edu, and Cynthia Fritschi,
fritschi@uic.edu

DOI: 10.2337/diaspect.29.1.2

©2016 by the American Diabetes Association.
Readers may use this article as long as the work
is properly cited, the use is educational and not
for profit, and the work is not altered. See <http://creativecommons.org/licenses/by-nc-nd/3.0>
for details.

the influence of metabolic alterations—particularly hypoglycemia and hyperglycemia—on sleep. The article highlights the need for further research that can be translated into clinical practice.

In our third article, “Sleep Apnea in Type 2 Diabetes” (p. 14), Jimmy Doumit and Bharati Prasad describe a cascade of physiological events extending from obstructive sleep apnea to insulin resistance, glucose intolerance, and type 2 diabetes. In this cascade, intermittent hypoxia and sleep fragmentation lead to a number of abnormalities, including sympathetic activation, oxidative stress, and systemic inflammation and resulting in metabolic dysregulation. The authors explore the role of interventions such as continuous positive airway pressure therapy and weight loss on glucose homeostasis in prediabetes and type 2 diabetes.

In our final article, titled “Effect of Sleep Disturbances on Quality of Life, Diabetes Self-Care Behavior,

and Patient-Reported Outcomes” (p. 20), Eileen R. Chasens and Faith S. Luyster move beyond examining the relationship between sleep and biophysiological outcomes to explain how sleep disturbances such as insomnia, restless legs syndrome, and sleep apnea negatively affect mental and physical well-being, as well as quality of life. Evidence gathered largely from descriptive studies suggests that poor sleep may interfere with healthy nutrition and physically active lifestyles. Paradoxically, it is also likely that poor nutrition and physical inactivity interfere with sleep, creating a vicious cycle in those whose health is dependent on maintaining a healthy lifestyle. Of special interest to readers will be the authors’ review of the limited studies targeting the effects of poor sleep on diabetes self-care behaviors.

Further research into the complex relationships between sleep and diabetes self-care behaviors is necessary for improving how we address

patients’ ability to care for their diabetes. This article supports the recommendation that routine clinical encounters with patients with diabetes must include some form of sleep assessment; such assessments should be conducted routinely, even in the absence of overt sleep problems. This article and the previous one by Doumit and Prasad support the need for screening for sleep apnea as part of routine follow-up.

We hope this From Research to Practice section will stimulate interest in exploring the complex associations between sleep and diabetes, highlight the need for routine clinical assessment of sleep disturbances for patients with diabetes, and encourage the development of interventions to reduce sleep disturbances in this population.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.