



**Big Health**

# **Better sleep: the secret to employee mental health**

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# Agenda

- 1 The sleep and mental health connection
- 2 Improving employee sleep with Sleepio
- 3 Why start with sleep
- 4 Results of program rollout

# Big Health

We are a digital medicine company

- Highly personalized behavioral medicine programs for mental health
- As scalable as drugs, as effective as in person therapy
- Backed by gold-standard clinical research

# What are the consequences of poor sleep?

Irritability

Fatigue

Accidents/  
errors

Concentration  
problems

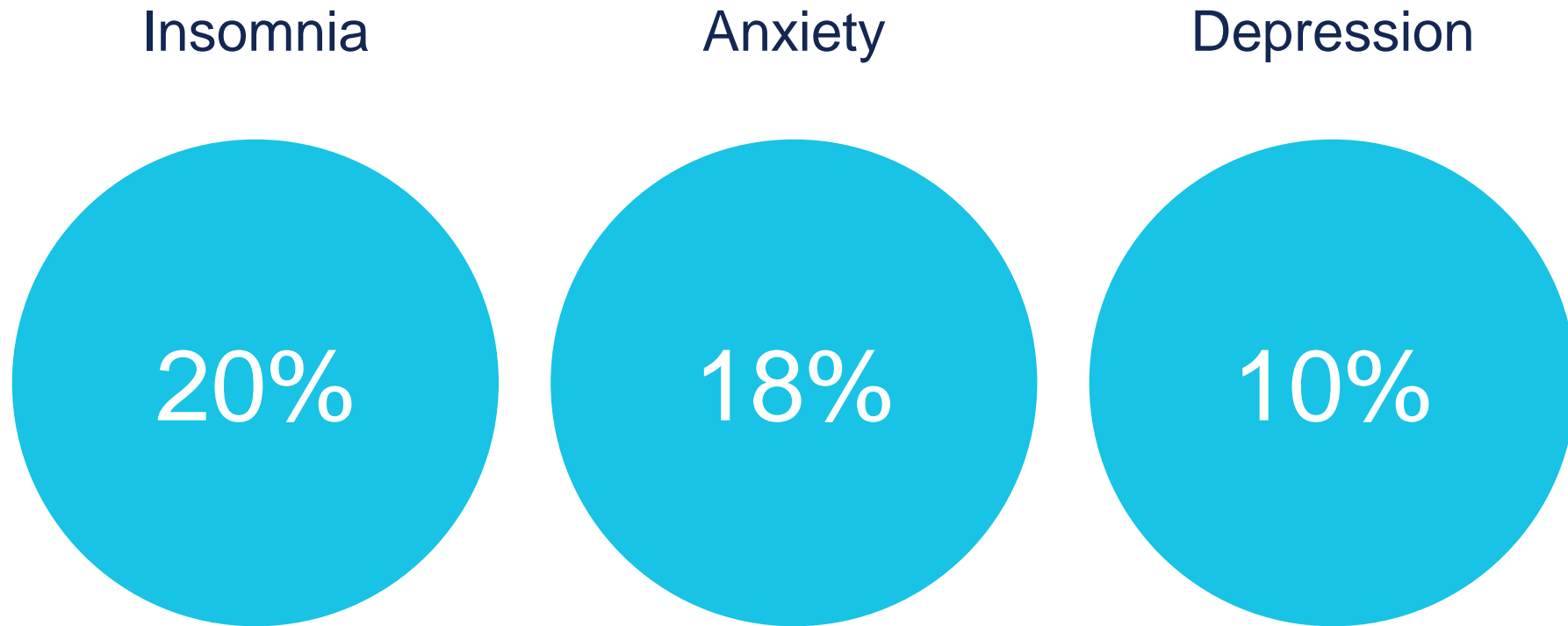
Reduced  
empathy

Lower  
productivity

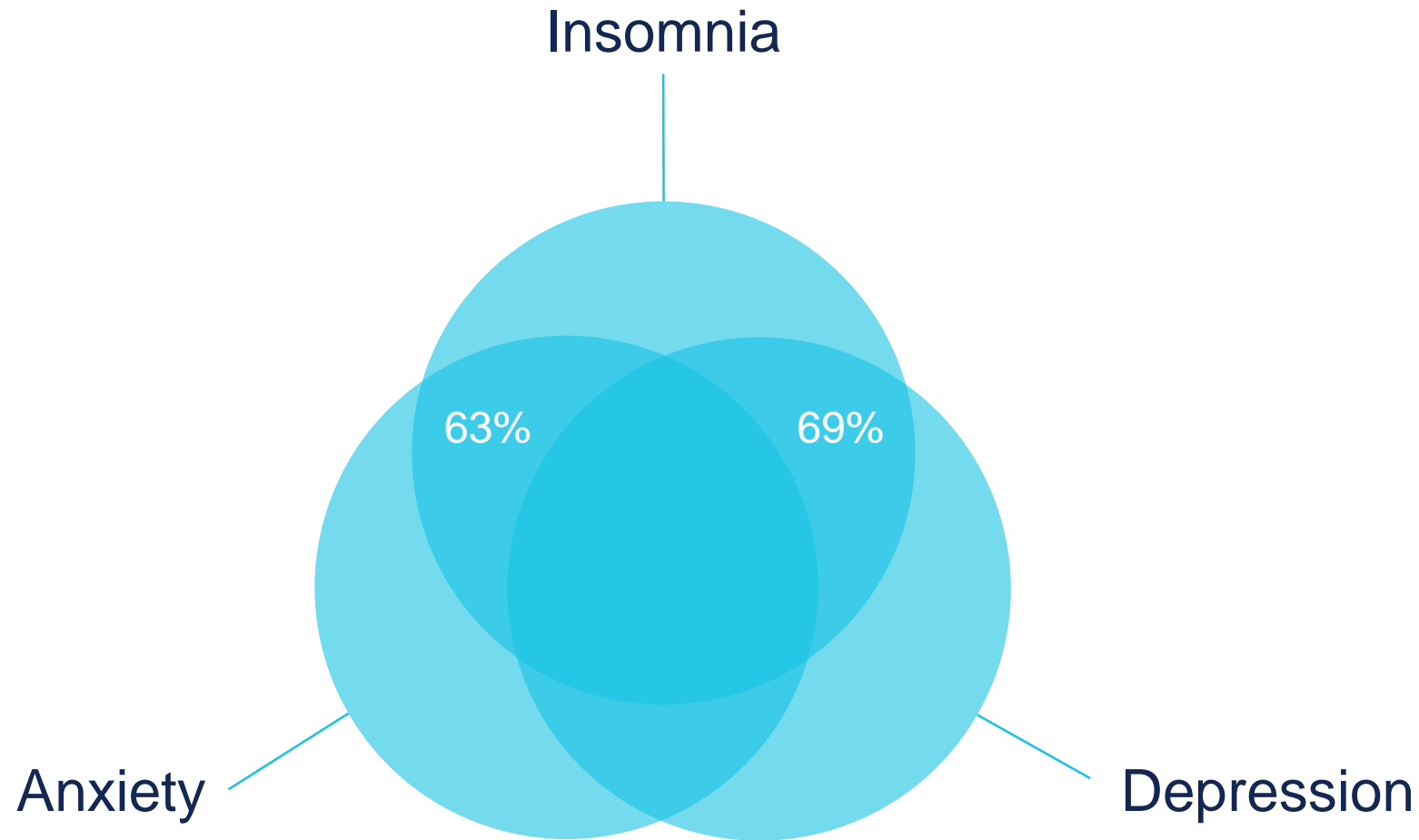
Illness

But, the dirty secret is that the biggest impact of poor sleep is on mental health

1 out of 5 adults has a significant mental health disorder



It turns out, they are highly interrelated and overlapping



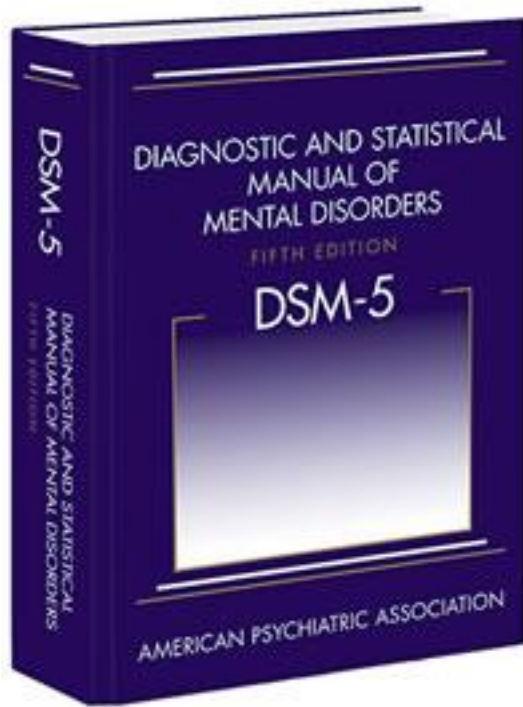
# Sleep and mental health has a complex, bidirectional relationship







# What is insomnia?



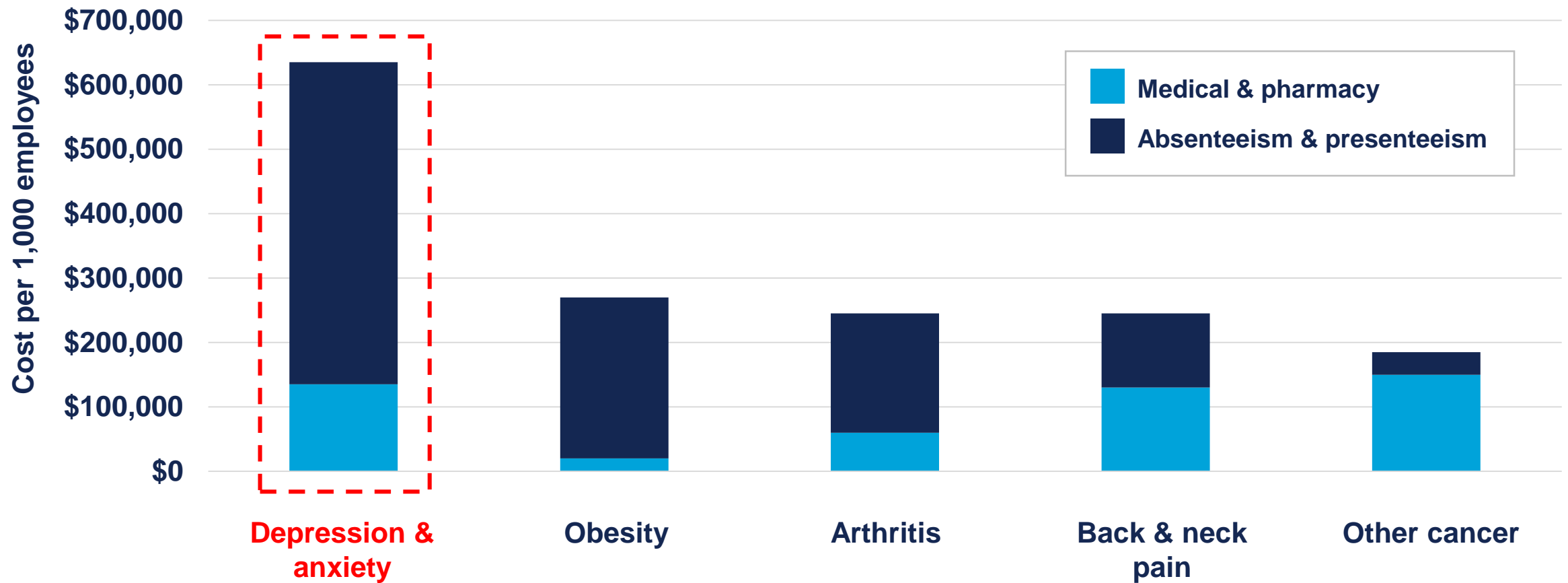
1. Repeated difficulty falling asleep, staying asleep, or waking early
2. Occurs despite adequate opportunity for sleep
3. Results in daytime impairment
4. 3 nights/wk for 3 months or more
5. Causes significant problems in functioning

# Insomnia is a vicious cycle of hyperarousal – perpetuated by unhelpful thoughts and behaviors



# The impact is huge – both for individuals, and for employers

Top five health conditions by  
annual healthcare expenditure and lost productivity costs



The scientific literature indicates that individuals with insomnia each year cost their employers in healthcare expenditure...

1.75 x

that of a  
good sleeper

\$3,855

more than  
good sleepers

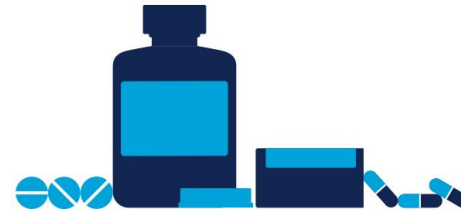
# How is insomnia being addressed today?

## Self-medication



Alcohol and OTC aids

## Sleeping pills



Hypnotic drugs

# Sleeping pills have risks, side effects, and are not intended for long-term use

## Sleeping pills...

Frequently lead to dependence and rebound insomnia<sup>1</sup>

Contribute to daytime drowsiness and dizziness<sup>1</sup>

Associated with substantial increased risk of falls in the elderly, leading to a strong recommendation to avoid by the American Geriatric Society<sup>2</sup>

Associated with increased risk of motor vehicle accidents<sup>3</sup>, ED visits<sup>4</sup>, and all-cause mortality<sup>5</sup>

And... they don't actually improve sleep nearly as much as most people think<sup>1</sup>



## Sleeping pills for insomnia

**They may not be the best treatment option**

Fortunately, a solution exists

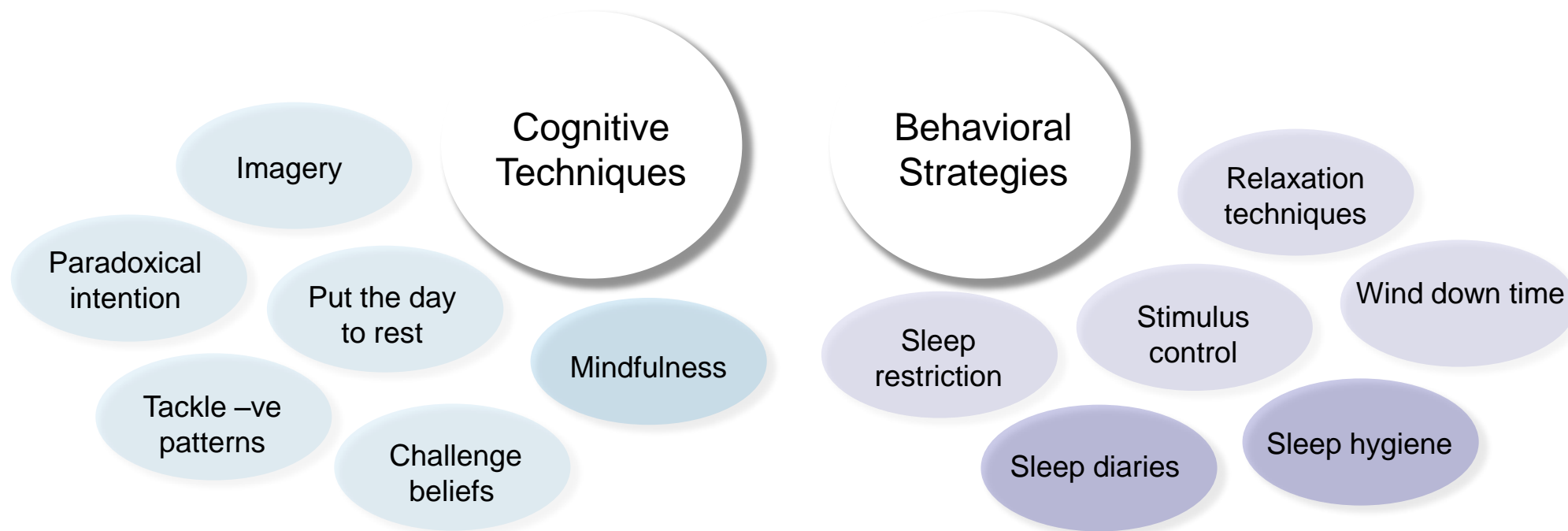


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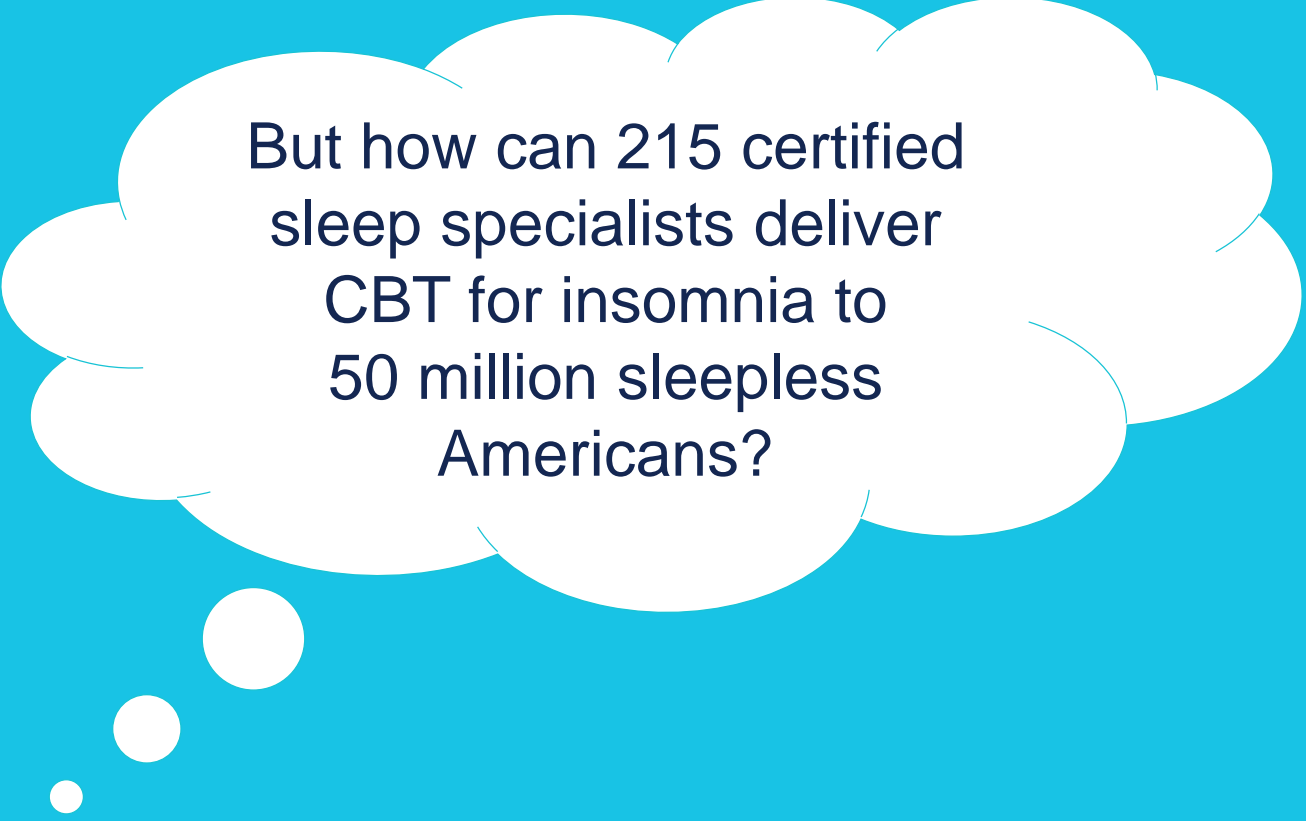
AMERICAN COLLEGE OF PHYSICIANS  
INTERNAL MEDICINE | *Doctors for Adults*®



recommend Cognitive Behavioral Therapy  
for Insomnia as the first line treatment



**Sleepio**



But how can 215 certified  
sleep specialists deliver  
CBT for insomnia to  
50 million sleepless  
Americans?

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Our solution: **Sleepio**

A digital Cognitive Behavioral Therapy (CBT) sleep improvement program which delivers improved mental health at population scale

# Sleepio works by providing everyone with the level of help they need, when they need it

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1. **Sleep awareness campaign**  
We work in partnership with employers to create fun and engaging sleep awareness campaigns with impact
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2. **Personalized light sleep help**  
Our validated sleep test enables us to deliver personalized advice for each employee to help them with their specific sleep issues
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3. **Scientifically proven Cognitive Behavioral Therapy program**  
Persistent poor sleepers will be directed to Sleepio's clinically proven full course of Cognitive Behavioral Therapy (CBT)

# Backed by gold standard clinical evidence: 18 published papers including 5 randomized controlled trials (RCTs)

Placebo controlled trial of digital CBT for Insomnia

Espie et al. (2012)  
Sleep Medicine

Sleep & productivity benefits of digital CBT for Insomnia

Bostock et al. (2016)  
JOEM

Treatment of anxiety and depression with digital CBT for Insomnia

Luik et al. (2016)  
Behavioral & Cognitive Psychotherapy

Helping Employees Sleep Well: Effects of Cognitive Behavioral Therapy for Insomnia on Work Outcomes

Barnes et al. (2016)  
Journal of Applied Psychology

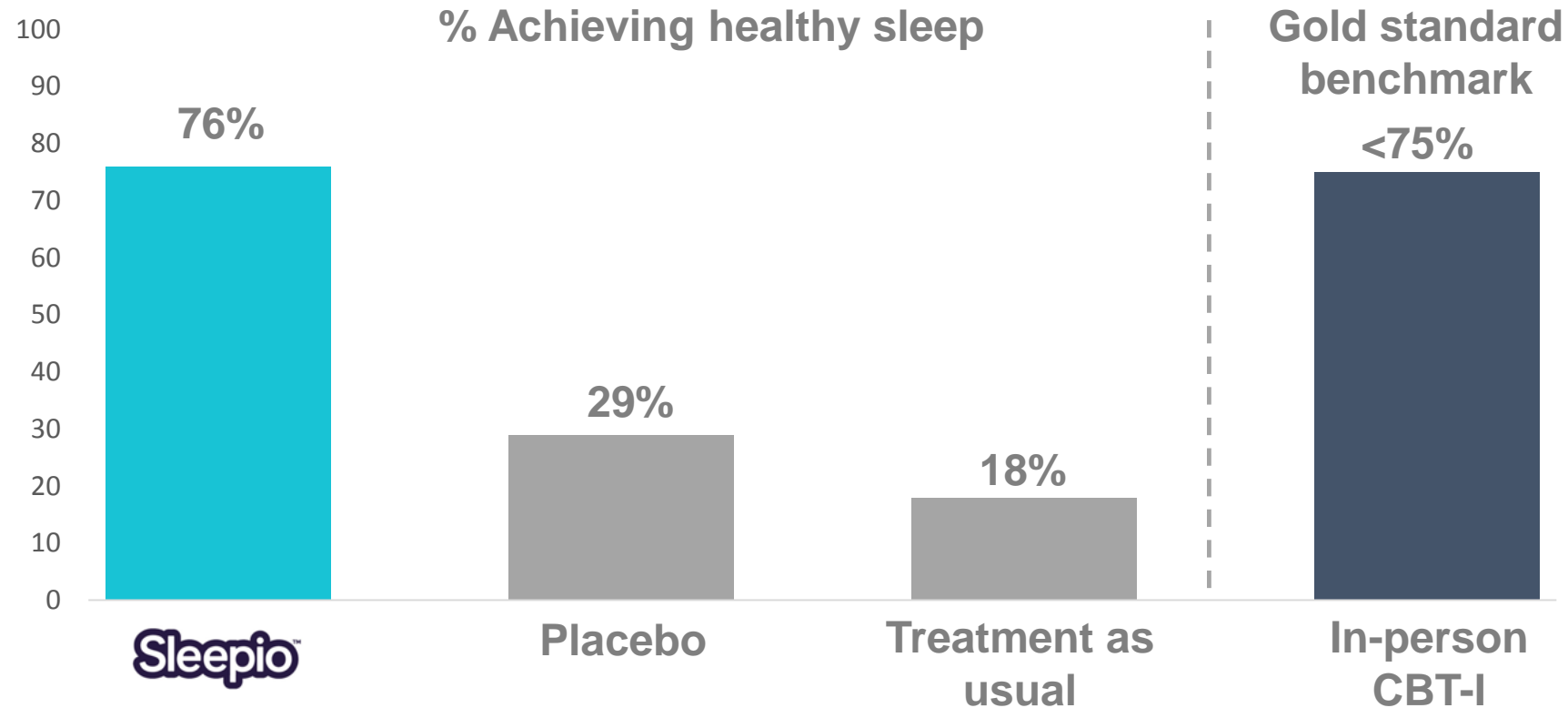


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OXFORD



KAISER PERMANENTE®

# In a placebo-controlled randomized trial, 76% of insomnia sufferers using Sleepio achieved healthy sleep



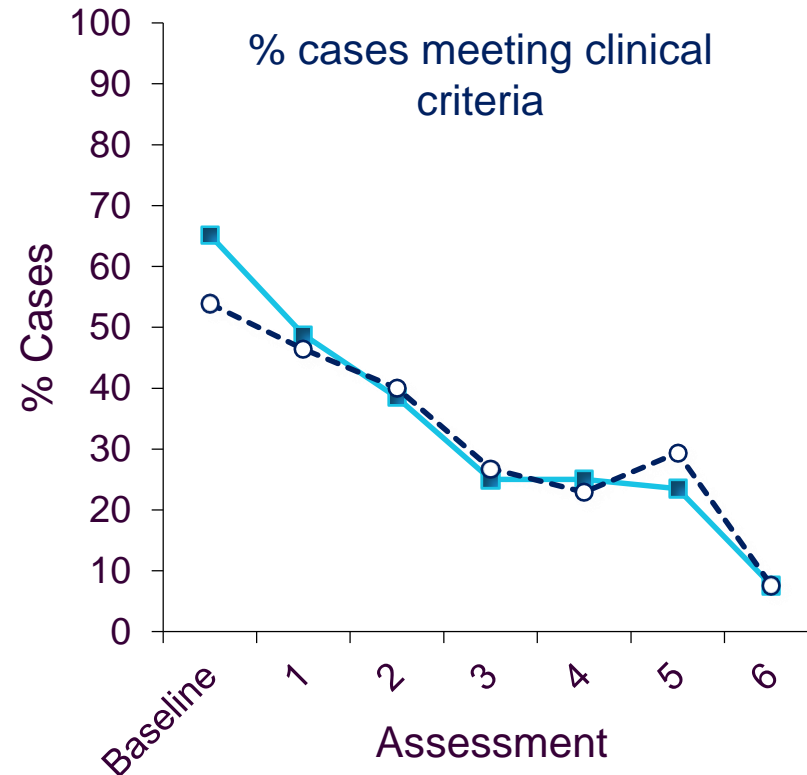
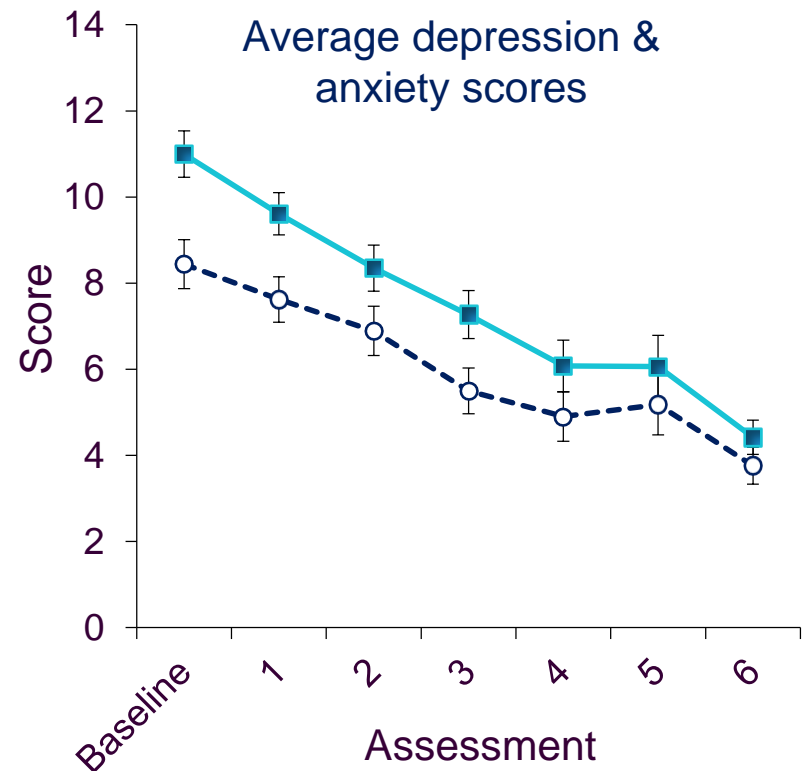
*"About as effective as CBT delivered in person"*

nature

*"A proven intervention for sleep disorders"*

THE LANCET

# Beyond sleep: in a study with UK's National Health System, Sleepio helped 68% of depression and anxiety sufferers move to recovery



Key  
Depression  
PHQ9 = Patient Health Questionnaire  
Anxiety  
GAD 7 = Generalized Anxiety Disorder

Source: Luik et al. (in press) Change in depression and anxiety during treatment (number of observations per session: baseline n=89; assessment 1 n=84; assessment 2 n=65; assessment 3 n=56; assessment 4 n=48; assessment 5 n=34; assessment 6 n=66). Panel A reflects the change in score on the Patient Health Questionnaire (PHQ-9) and Generalised Anxiety Disorder (GAD-7); panel B reflects the percentage of persons who experience symptoms at a clinical level on the PHQ-9 and GAD-7.



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## Key facts about The Hartford

- Founded in 1810
- Approximately 17,000 employees
- Headquarters: Hartford, Conn.
- With more than 200 years of expertise, The Hartford is a leader in property and casualty insurance, group benefits and mutual funds.
- The Hartford sells its products primarily through a network of independent agents and brokers.
- For more than 30 years, The Hartford has been the only nationally endorsed direct auto and home insurance program for AARP's 37 million-plus members.

<b>Business Insurance</b> <ul style="list-style-type: none"><li>• Workers' compensation</li><li>• Property</li><li>• General liability</li><li>• Professional liability</li><li>• Auto</li></ul>	<b>Personal Lines</b> <ul style="list-style-type: none"><li>• Home</li><li>• Auto</li><li>• Renters</li><li>• Umbrella</li></ul>	<b>Employee Benefits</b> <ul style="list-style-type: none"><li>• Group disability, life and AD&amp;D</li><li>• Absence management</li><li>• Voluntary benefits, including critical illness and accident</li><li>• Group retiree health</li></ul>	<b>Mutual Funds</b> <ul style="list-style-type: none"><li>• Equity, fixed income and asset allocation funds sub-advised by Wellington Management</li></ul>
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Sleep is a destigmatized way of addressing mental health

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**How did you sleep last  
night?**

## Poor sleep was very common among employees

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Our employee health risk assessment showed us...

**40%** of employees were consistently **sleep deprived**

... which we knew leads to significant impacts on health & wellbeing

Sleep deprived = receiving less than 7 hours of sleep on average as recommended by the National Sleep Foundation.

## We learned that insomnia was very expensive

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A claims analysis told us...

**11%**

**have an insomnia-  
related claim**

**2.5x**

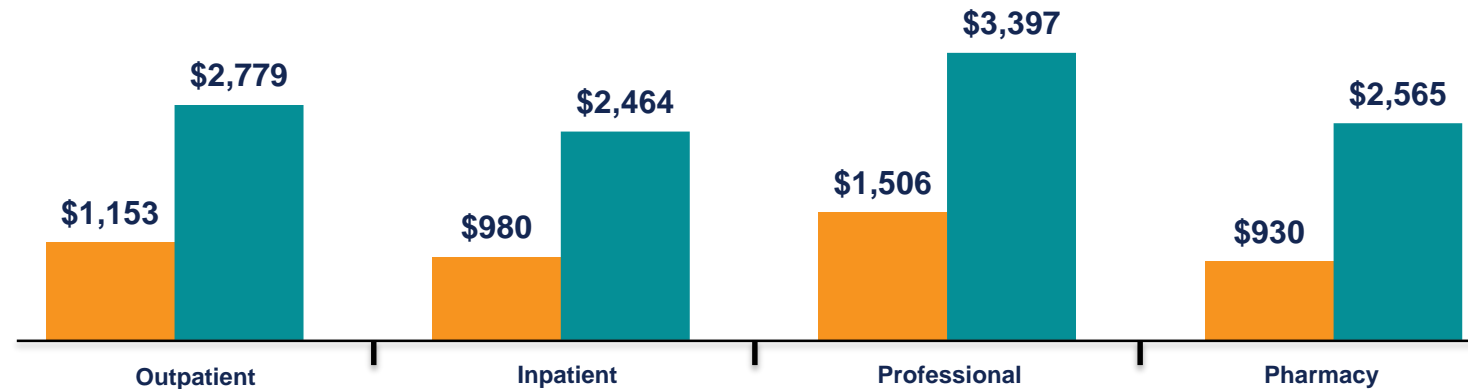
**more expensive than good  
sleepers**

Insomnia-related claim = insomnia diagnosis or insomnia treatment prescription in last year.

## Those with insomnia were significantly more expensive across every category of healthcare spend



**+\$6,636** additional spend per insomnia claimant



Insomnia-related claim = insomnia diagnosis or insomnia treatment prescription in last year.

## Why Sleepio?

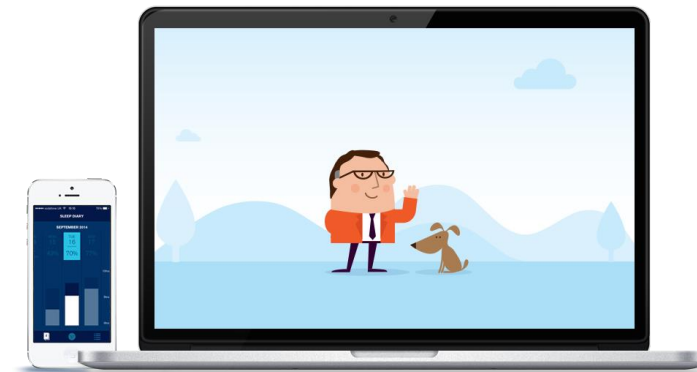
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Clinically validated: 17 published peer-reviewed scientific papers

Relevant for all employees, good sleepers and poor sleepers alike

Behavioral component, not just sleep tracking and sleep hygiene

Engaging & entertaining program





Since launching Sleepio a year ago...

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~4,100

employees have completed the  
Sleepio sleep test

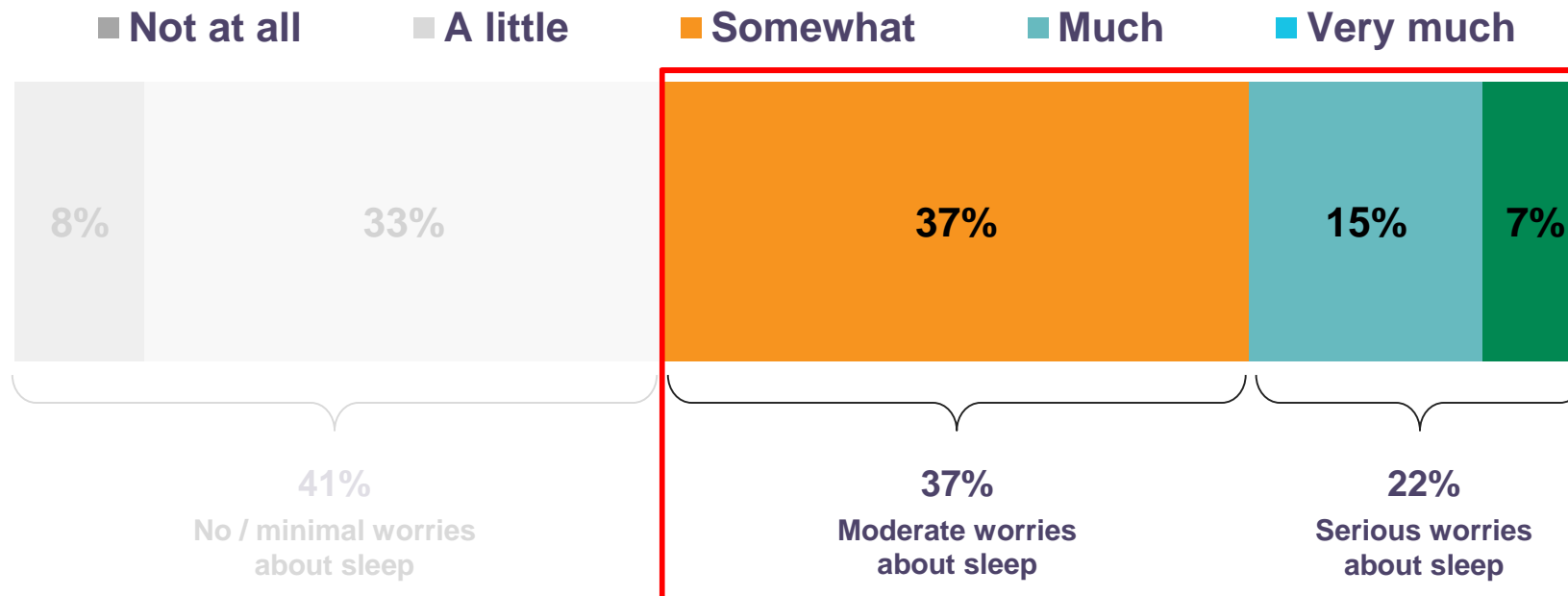




Based on these responses, ~60% of employees are troubled by their sleep; about 1 in 5 seriously so

## Employees troubled by their sleep

Over the past month, to what extent has poor sleep troubled you in general?



Note: total sleep tests = 4,107 (23% of the workforce)

## Employees who are seriously troubled by their sleep are...

### Mental health



6 x

more likely to  
often feel  
stressed

### Physical health



2 x

more likely to  
report their  
health as only  
'poor' or 'fair'

### Productivity



2 x

more likely to  
miss time at  
work each  
week

Note: total sleep tests = 4,107 (23% of the workforce)

To address the problems they're having, large numbers of employees are using sleeping pills and sleep aids



### OTC sleep aids

Used by  
**22%**  
of employees surveyed

### Sleeping pills

Used by  
**8%**  
of employees surveyed

Note: n=1,946, all employees completing the detailed sleep test

3,401 employees made use of the personalized light sleep help and 1,479 started the CBT program



Those starting the CBT program typically remain engaged for long periods

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Of all those using the CBT program...

**77%**

have used Sleepio for over 8 weeks

**204** days

the average number of days active in the Sleepio program

Note: n=1,479, all employees who have used the CBT program

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**Did Sleepio actually work?**

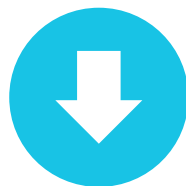
## Employees have seen meaningful improvements in their sleep pattern

They are now...

... falling asleep

**54%**

faster



27 min ➡ 13 min

... spending

**36%**

less time awake at  
night



25 min ➡ 15 min

Note: n=716, employees completing the CBT program



Leading to substantially more sleep overall

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**7 hours**  
additional sleep  
each week



6.1 hrs → 7.1 hrs  
Each night

Note: n=716, employees completing the CBT program

With better sleep, there was less of a need for sleeping pills



OTC sleep  
aids



**31%**  
reduction

Sleeping  
pills



**37%**  
reduction

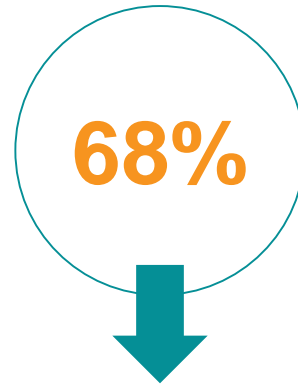
...in the number using either type of medication in the  
previous 2 weeks

Note: n=716, employees completing the CBT program

And considerable improvements in absenteeism and productivity

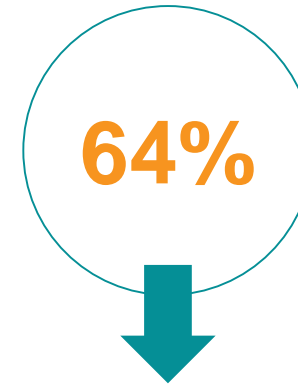
Those using the CBT program have seen improvements in measures of...

**Absenteeism**



**Reduction in  
employees missing  
time at work**

**Presenteeism**



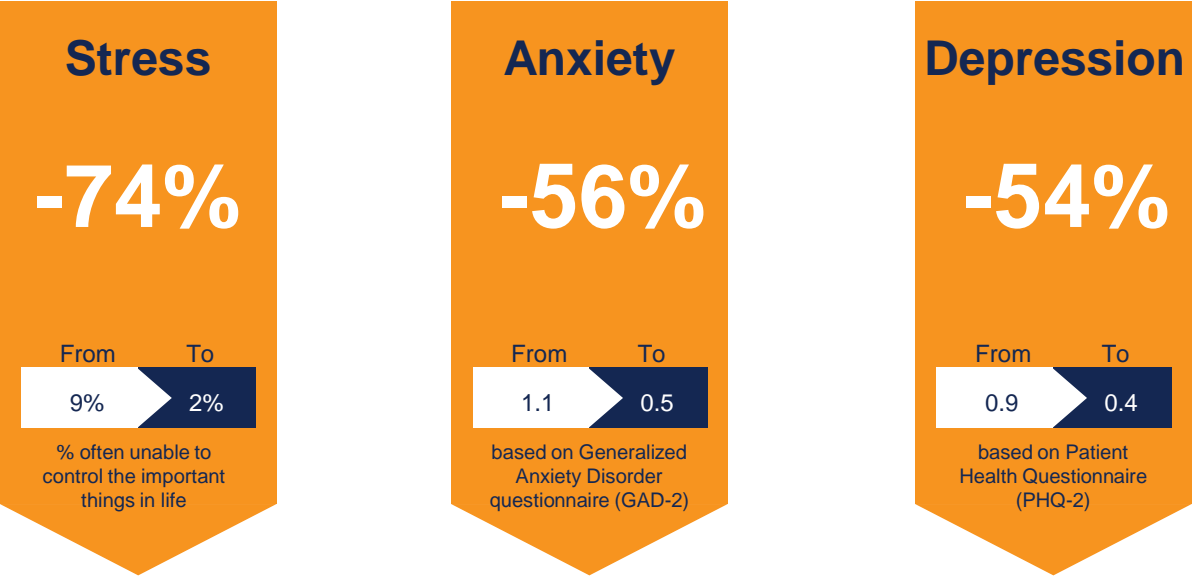
**Reduction in employees  
stating poor sleep has  
an impact >20% of the  
time**

Note: n=716, employees completing the CBT program

As we had hoped, there were also meaningful improvements in stress and mental health



Those completing the program saw improvements in...



Note: n=716, employees completing the CBT program

Most importantly, employees loved it

88%

**recommended Sleepio**

“Sleepio helped big time...The #1 thing you did for me was allow me to stop worrying about my sleep.”

“I don't have a real problem but the segment on "waking up at night" and what to do really helped.”

“Several simple suggestions made a large difference!”

“I feel that I was not in a terrible state when I started, but I now get 30 minutes more GOOD SLEEP each night. That is a very good and valid improvement. Thanks all”

“Love the Prof & his dog friend... his accent and little red jacket would make me smile during sessions! I will miss them! :)”