SLEEP DEPRIVATION IN THE WORKPLACE
The Silent Epidemic

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Optisom & Sleep Data
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Pulmonary, Critical Care & Sleep Medicine
The Functions of Sleep

Cleansing
Consolidation
Restorative
Sleep Load – Process S

Alerting Signal – Process C
Prevalence of Sleep Deprivation

1960: 8 Hours
2002: 7 Hours
2016:
- 30% < 6 Hours
- 40% < 7 Hours

CDC MMWR Vol 60 / No. 8 March 4, 2011
“Insufficient sleep is a public health epidemic.”

– Centers for Disease Control and Prevention
TRUE or FALSE?

Humans can function just fine on 4-6 hours of sleep
Why We Lack Insight

Sleepiness Score

1 Day

2 days

3 Days

4hrs & 6hrs
Performance Lapses

Van Dongen H. Sleep 2003;2:117-126

Why We Lack Insight
TRUE or FALSE?

Sleep does not affect my overall physical health
Obesity
Heart Attack
Diabetes

7.5x
1.45x
1.7x

HEALTH
559 additional calories consumed
What would you say if:

I told you I could take a previously healthy millennial and without changing their diet or medications make them pre-diabetic in one week?

- Decreased glucose tolerance
- Decreased insulin secretion
- Increased evening cortisol concentrations
- Increased sympathetic nervous system activity
TRUE or FALSE?

Sleep does not affect my safety
20% of all serious car crash injuries

70% more likely to be involved in workplace accidents

Sleep Deprived vs. well rested

SAFETY
## Effects of Sleep Deprivation

<table>
<thead>
<tr>
<th>Level of sleep deprivation</th>
<th>B.A.C. Equivalent</th>
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<tr>
<td>24 hours without sleep</td>
<td>0.1%</td>
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<tr>
<td>4-5 hours per night for 7 nights</td>
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<tr>
<td>6 hours per night for 10-12 nights</td>
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Van Dongen H. Sleep 2003;2:177-26
Dinges D. Sem Neurology 2005;23:117-29
High Profile Accidents

Three Mile Island

Space Shuttle Challenger

Exxon Valdez
1,550
Fatalities

40,000
Nonfatal injuries per year

Drowsy Driving Events
Sleep Deprivation’s Impact on Safety

- 274,000 Insomnia related workplace accidents
- $32,062 Average cost of insomnia related accident
- $31B Combined value of workplace accidents
TRUE or FALSE?

Sleep does not affect my overall performance
2x Chance of missing work

3x Likelihood of getting a cold

10x Increased risk of depression

PRODUCTION
Sleep Deprivation’s Impact on Productivity

- 21.8% Insomnia Prevalence
- $2,280 Value of individual lost productivity
- 253M Days of lost productivity nationwide
TRUE or FALSE?

Sleep apnea is only a matter of inconvenient snoring
What is Sleep Apnea
Sleep Apnea associated Co-Morbidities

- 72% Diabetes
- 76% Heart Failure
- 57% Coronary Artery Disease
- 63% Stroke
- 49% Atrial Fibrillation
- 77% Obesity
- 83% Hypertension
- 45% Depression
Sleep Disorder **Prevalence and Impacts**

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<tr>
<th>Sleep Disorder</th>
<th>US Population Affected</th>
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“Sleep deprivation is the **#1 under addressed** health issue today”
Prevalent Sleep Disorders

Sleep Deprivation
DIAGNOSIS:
- History / Sleep Log
- Actigraphy

THERAPY:
- Behavior change
- Sleep Hygiene
- Cognitive Behavioral Therapy

Insomnia
DIAGNOSIS:
- History / Sleep Log
- Actigraphy

THERAPY:
- Cognitive Behavioral Therapy
- Sleep Hygiene
- Medical / Psychiatric illness therapy

Sleep Apnea
DIAGNOSIS:
- History
- Sleep Study

THERAPY:
- CPAP / Oral devices
- Sleep Hygiene
- Cognitive Behavioral Therapy
What Is The Solution?
Comprehensive Sleep Health Solutions

- Comprehensive and clinically validated sleep health assessment
- Education to help users better understand their sleep health issues
- Web App to address Insomnia using Cognitive Behavioral Therapy
- Simple, consumer focused pathway to treat sleep apnea
ProjectZ Apnea Care

- Patients connect for free with a Sleep Data sleep health coach to get started on their journey to restful & restorative sleep.
- Sleep Data facilitates a telemedicine consult with a board certified physician to analyze a patient’s sleep.
- An easy-to-use sleep recorder will be shipped directly to patient’s home. No waiting on doctors appointments or overnight stays in a sleep laboratory.
- Based off patient’s results, Sleep Data will facilitate a personalized treatment plan and support patients through the process.
“Eating the right foods provides energy for your workout and improves the quality of your sleep. In turn, a sound night of sleep makes you more likely to eat right the next day. **This is why the real magic lies at the intersection between eating, moving, and sleeping.**”

- Tom Rath, Eat Move Sleep: How Small Choices Lead To Big Changes
Welcome to ProjectZ: Better Sleep Starts Here

rgnext.optisom.com
Company Code: rgnextsleep
An International Problem

35% United Kingdom
49% Czech Republic
38% France
37% Ireland
39% Germany

37% Italy
35% Poland
34% Spain
46% Sweden
Increased Prevalence of Issues Among Poor Sleepers

- 76% are grumpy
- 65% poor performance
- 86% poor concentration
- 84% increased appetite
Health

$16 BILLION
Spent by US companies on healthcare expenses related to sleep

Safety

$31 BILLION
Cost of sleep related workplace accidents & mistakes

Productivity

$63 BILLION
Lost by US companies due to lower productivity caused by poor sleep

The Cost of Sleep Deprivation

NIH MedlinePlus Summer 2012;7:16
Shahly V. Arch Gen Psychiatry 2012;69(10):1054-63
Kessler R. Sleep 2011;34(9):1161-71
PROJECT

Sleep Health Solution
The American College of Physicians recommends that all adult patients receive cognitive behavior therapy for insomnia as the initial treatment for chronic insomnia disorder.

"Online Cognitive Behavioral Therapy is Effective in Treating Chronic Insomnia"

- American Academy of Sleep Medicine

A Proven Solution
300 specialists in Cognitive Behavioral Therapy for insomnia (CBTi) nationwide
- Primary care physicians overwhelmed
- Insufficient number of sleep specialists

Access Is The Issue
Take 5 minute sleep health assessment

Receive a personalized sleep health report

Complete customized CBT program to improve sleep health

ProjectZ Key User Experience
INSOMNIA
- Shift Work
- Bedtime Anxiety
- Delayed Sleep Phase Syndrome
- Hypnotic Dependence
- Chronic Stress

SLEEP DEPRIVATION
- Advanced Sleep Phase Syndrome
- Sleep Hygiene
- Sleep Apnea
- Jet Lag

Identifying The Cause
Personalized Sleep Health Plan

Shannon's Sleep Report

Your Overall Sleep Health
You are experiencing symptoms of insomnia and sleepiness or fatigue. Fortunately, you appear to be at low risk for sleep apnea. We're recommending that you work with your doctor to evaluate your insomnia symptoms. ProjectZ can help with your insomnia treatment. Below, you can read the rest of your sleep report and some suggestions for better sleep, compliments of ProjectZ.

Better Sleep. We Promise.
When life gets hectic, your sleep is often the first thing that suffers. Fortunately, our bodies quickly respond when we take time to invest in our sleep health. Our physicians have developed simple, effective steps to target your specific sleep issue and make immediate improvements. Over the next 14 days, we invite you to try out three of our sleep health units for immediately improved health.

Dealing with Shift Work
Re-Train Your Brain
Get the Most Just Right


Accept 14 Day Challenge
The Personalized Sleep Health Solution

Advanced Sleep Phase Syndrome
Conditioned Arousal
Delayed Sleep Phase Syndrome
Hypnotic Dependence
Insomnia
Obstructive Sleep Apnea
Shift Work
Sleep Deprivation
Sleep Hygiene
Stress

A.M. Light
ASPS Therapy
DSPS Therapy
Jet Lag Protocol
Sleep Apnea
Sleep Apnea Education
Shift Work Therapy
Relaxation Exercise
Sleep Compression
Sleep Deprivation Education
Sleep Diary
Sleep Hygiene
Worry Exercise
Stimulus Control
Clean and Concise User Interface
Actionable Challenges To Improve Sleep Health

Kick Off The Tick Tock

Lie down in bed in your room. Does the clock say 10:00? No? That’s news: they’re at home.

101: Create a Bedtime Routine

Read “How to Develop a Sleep Routine” to better understand why and how to develop a sleep routine.

Read Article
54%
PARTICIPATION
Morrison Healthcare Sleep Issues Breakdown

- Sleep Deprived: 47%
- At Risk for Sleep Apnea: 34%
- Restless Legs Syndrome: 16%
- Bedtime Anxiety: 46%
- Chronic Insomnia: 47%
- Borderline Insomnia: 19%
- Stress that Impacts Sleep: 26%
Prevalence of Significant Sleep Issues

- 70% of employees suffered from one or more significant sleep health issues
- 47% of employees suffered from two or more significant sleep health issues
- 25% of employees suffered from three or more significant sleep health issues
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| < 5 hours          | 7%  
| 5-6 hours          | 33% |
| 6-7 hours          | 42% |
| 7-8 hours          | 17% |
| 8+ hours           | 1%  |

**After completing ProjectZ**

82% achieved ≥ 2 hours more sleep per week

47% achieved ≥ 3.5 hours more sleep per week
Felt the program was personalized

Reported improved sleep

Reported improved overall health
Validated ROI & Outcomes

67\% 
Success in resolving symptoms of insomnia

71\% 
Reduction in daytime sleepiness

6.5x 
ROI based on productivity gains alone

AIMS - Measures the presence and severity of Insomnia
ESS - Clinically validated measure of daytime sleepiness
WLQ - Clinically validated measure of productivity limitations
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Treatment Options For OSA

- Permanent weight loss
- Continuous positive airway pressure (CPAP)
- Oral appliances
- Oral and/or maxillo-facial surgeries
- Tracheostomy
- Hypoglossal nerve stimulator
Treatment Options For OSA

CPAP stands for Continuous Positive Airway Pressure

Splints open the airway so you can breathe.
CPAP Therapy For OSA

Applied via nasal mask
Acts as pneumatic splint
Compliance limits utility
Mask fit crucial
What are Respiratory Events

**Apnea** – no airflow ≥ 10 seconds

**Hypopnea** – reduced airflow ≥ 10 seconds, usually associated with oxygen desaturation or evidence of arousal