

# InsomniCare<sup>SM</sup>

## A Cloud-Based, Stepped-Care Solution for Sleep Center Management of Chronic Insomnia

- Provides access to care for millions of patients with untreated chronic insomnia
- Delivers a specialized service through sleep centers in the Medical Home model
- Expands options to address the FDA drug safety warning to lower insomnia drug doses
- Improves clinician interpretation of subjective complaints regarding poor sleep quality



1

**Screen:** Identify at-risk patients using insomnia, sleepiness and depression severity indices



6

**Monitor:** Ensure patient is progressing with online CBT-I or refer to a trained therapist



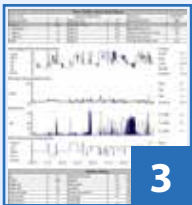
2

**Assess:** Conduct a two-night baseline Sleep Profiler study in the patient's home



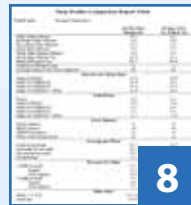
7

**Assess:** Perform post-treatment Sleep Profiler assessment when CBT-I is completed



3

**Interpret:** Edit sleep staging and evaluate objective measures of sleep architecture and continuity



8

**Confirm:** Interpret sleep study and utilize comparison report to evaluate impact of CBT-I



4

**Consult:** Review outcomes with patient to reinforce program effectiveness



9

**Consult:** Compare perceived vs. actual sleep metrics with the patient



5

**Treat:** Order six-week online Cognitive Behavioral Therapy–Insomnia (CBT-I) using the web portal



10

**Deliver:** Expand services to include an integrated stepped-care solution for Insomnia

## COMPARISON REPORT - NARRATIVE

<b>Study Type:</b>	Diagnostic	<b>Study Type:</b>	Treatment Follow Up
<b>Date of Night 1:</b>	04 Feb 2013	<b>Date of Night 1:</b>	25 Mar 2013

**CLINICAL HISTORY:** 62 year old female presented with a BMI of 21 and a 13-inch neck. The patient has a history of insomnia. The patient exhibited moderate insomnia based on an Insomnia Severity Index of 19 and no clinically significant daytime sleepiness based on an Epworth score of 7.

Study One: The patient underwent a one-night diagnostic EEG study. When compared to normal gender-matched subjects, the patient is in the bottom 10th percentile, for at least one night, based on low percentage of time in stage N3 and high percentage of time in stage N1. When compared to normal age-matched subjects, the patient is in the bottom 10th percentile, for at least one night, based on low percentage of time in stage N3 and high percentage of time in stage N1.

CBT-I: The patient was referred for a six-module cognitive behavioral therapy for insomnia (CBT-I) program and completed the Overview, Sleep Behavior 1, Sleep Behavior 2, Sleep Thoughts, Education, and Problem Prevention cores. CBT-I included sleep restriction initiated with a sleep window of 5 hours and 20 minutes and increased to 6 hours and 40 minutes as a result of therapeutic improvements. Based on sleep diaries, over the course of the CBT-I therapy, the patient's sleep efficiency increased from 80.0% to a high of 91.0%, sleep latency decreased from 30 minutes to a low of 15 minutes, and wake after sleep onset decreased from 70 minutes to a low of 20 minutes. Upon completion of CBT-I, the patient exhibited no clinically significant insomnia based on an Insomnia Severity Index of 6. The Epworth score increased from 7 to 10, a paradoxical outcome commonly associated with improvements in insomnia symptoms.

Study Two: The patient underwent a one-night treatment follow-up EEG study. When compared to normal gender-matched subjects, the patient is in the bottom 10th percentile, for at least one night, based on low percentage of time in stage N3 and high percentage of time in stage N1. When compared to normal age-matched subjects, the patient is in the bottom 10th percentile, for at least one night, based on low percentage of time in stage N3 and high percentage of time in stage N1.

Comparison of Study One and Two: The table below presents comparison results for each night of initial and follow-up studies. Based on averages across nights, test-retest improvements were noted as a result of decreased wake after sleep onset.

Compares pre-treatment sleep quality metrics to gender- and age-matched norms

Summarizes the impact of CBT-I education and sleep restriction on insomnia severity and perceived sleep patterns

Compares post-treatment sleep quality metrics to gender- and age-matched norms

Presents improved sleep metrics from pre- and post-treatment studies

## COMPARISON REPORT - SLEEP QUALITY METRICS

		04 Feb 2013 Diagnostic	25 Mar 2013 Tx. Follow Up	
Objective characterization of sleep time and patterns	Study Time (Hours)	9.3	8.1	
	Excluded Time (Hours)	0.6	0.0	
	Recording Time (Hours)	8.7	8.1	
	Sleep Time (Hours)	7.9	7.7	
	Sleep Time Supine (Hours)	2.0	0.5	
	Sleep Time Supine (%)	24.9	6.2	
	Sleep Efficiency (%)	90.2	95.0	
	Number of Sleep Cycles	6	5	
	Average Sleep Cycle Time (Minutes)	83	95	
	<b>Percent (%) Sleep Time</b>			
Analysis of sleep architecture elements known to impact comorbidities	Stage R (REM)	24.6	22.9	
	Stage N1 (NREM 1)	14.8	9.0	
	Stage N2 (NREM 2)	44.0	43.7	
	Stage N3 (NREM 3 / SWS)	16.6	24.3	
	<b>Total Hours</b>			
	Wake	0.9	0.4	
	Stage R (REM)	1.9	1.8	
	Stage N1 (NREM 1)	1.2	0.7	
	Stage N2 (NREM 2)	3.5	3.4	
	Stage N3 (NREM 3 / SWS)	1.3	1.9	
<b>Total Minutes</b>				
Quantification of arousals and awakenings that impact perception of sleep quality	Sleep Latency	9	8	
	REM Latency	70	64	
	NREM 3 Latency	12	14	
	Wake After Sleep Onset	43	16	
	<b>Average per Hour</b>			
Assessment of snoring by position for indications of sleep disordered breathing	Cortical Arousals	23.7	24.5	
	Sympathetic Arousals	16.5	7.8	
	Movement Arousals	4.2	3.1	
	Awakenings	3.2	2.1	
	<b>Percent (%) Time</b>			
Assessment of snoring by position for indications of sleep disordered breathing	>40dB Overall	9.7	2.7	
	Supine	0.2	0.0	
	Non-Supine	9.5	2.7	
	>50dB Overall	7.5	1.3	
	Supine	0.0	0.0	
	Non-Supine	7.5	1.3	