What is Insomnia?

**Acute Insomnia** = Less than 3 months
- Usually happens after some type of stressful life event
- May be in the context of another mental disorder or medical issue that should be addressed directly

**Chronic Insomnia** (Insomnia Disorder/Primary Insomnia):
- Problems with initiation and/or maintenance of sleep for 3+ nights/week for at least 3 months + indicators of day time distress or impairment.
- Not attributable (or no longer attributable) to another acute medical or psychiatric disorder
- Patients at this point no longer link the insomnia to its original presumed cause, and describe it as now having a life of its own.

Why Treat Insomnia?

- Chronic insomnia contributes to a significant degree of lost productivity, absenteeism, increased medical OVs, MVAs and other occupational accidents.
- Chronic insomnia raises the lifetime risk for a number of significant medical disorders (e.g. diabetes, obesity, cardiac)
- Continued insomnia after the remission of other major depression symptoms is a predictor for potential relapse, and often does not remit in other otherwise successfully treated mental health conditions (e.g. PTSD, anxiety disorders).
- Insomnia also contributes to an overall level of personal malaise and reduction in enjoyment in life, such as via the reduction of social and leisure contacts.
- Many patients with insomnia make daily decisions as to what activities in which to engage based on their perception of their sleep quality the night before.
- Such reduction of enjoyed/valued activities ironically can become a source of depressed mood.

Medication Interventions: Pro's and Cons

- In the short term, medication interventions for acute insomnia that is either in response to an acute stressor or psychiatric/medical disorder are effective interventions
- In the long term, many patients develop tolerance and/or psychological dependence to sleep medications, requiring escalating dosage levels and/or medication changes as prior regimens lose effectiveness.
- Abrupt withdrawal from many sleep medications can result in a rebound insomnia lasting 2-4 days, which often results in the patient giving up on trying to get off of sleep medications.
- Generally, positive responses stop when the medication is stopped (i.e. not curative)
Medication Interventions: Pro’s and Cons

- Sleep medications are not benign and have a number of potential side effects (e.g. REM suppression; sleep walking, eating, and driving [Ambien]; anticholinergic effects; headaches; dizziness; weight gain [Seroquel, Remeron]).
- Safety concerns have been raised for elderly populations for medications such as Ambien.
- A number of medications that are used for sleep are off-label and have neither FDA approval nor RCT efficacy data (e.g. Trazodone, Seroquel).

OTC Sleep Medications

- OTC sleep medications also have no RCT data for effectiveness (e.g. Melatonin) and share the same effectiveness issues problems over time as prescription medications.
- The common component of most OTC’s is generic Benadryl (Diphenhydramine HCL). Antihistaminergic agents can induce sleep (based on impact on brain nerve pathways that use histamine as a neurotransmitter) but increasing daytime side effects are associated with higher doses.

What about Sleep Hygiene?

- Common examples of sleep hygiene recommendations that all providers “know” and disseminate to patients include:
  - Reduce/eliminate caffeine and move the last ingestion farther away from bedtime
  - Reduce/eliminate ETOH usage, particularly before bedtime
  - Manage environmental noise/light/temperature in the bedroom
  - Engage in moderate daily exercise, but not right before bedtime
  - Eat a snack high in tryptophan (TRP) to help facilitate sleep

Sleep Hygiene: Facts and Implementation

- The American Academy of Sleep Medicine has determined that there is insufficient evidence to recommend sleep hygiene as a monotherapy for insomnia.
- That being said, general good sleep hygiene and sleep habits are important, and are necessary but not sufficient for the management of insomnia.
- Unfortunately, despite the fact that we as providers all “know” that our patients should do these things, current typical sleep hygiene recommendations are vague, inconsistent, and often non-specific, and have no hard-and-fast empirical support.

Primary Care Assessment of Insomnia:

The first issues to assess include:
- Is the insomnia acute or chronic?
- Is there overt interference with daily functioning?
- Is there subjective distress about the insomnia?
- Has the patient has begun to orient their life to coping with their sleep problems (e.g. cancelling plans, avoiding obligations, increased medical OV’s with sleep complaints, etc.)?

Primary Care Assessment of Insomnia:

Assess the patient for possible current underlying medical disorder of medications for which insomnia or complaints of poor sleep is a common symptom. Examples include:
- BPH
- GERD
- Chronic Pain
- Allergies/Asthma
- Cardiac functioning disorders (e.g. heart failure)
Primary Care Assessment of Insomnia

Consider possible other underlying sleep disorders for which insomnia, or complaints of poor sleep, is a common symptom:

- OSA
- RLS
- PLMS
- Narcolepsy

One of the markers of OSA, RLS, PLMS, and Narcolepsy is excessive daytime somnolence (EDS), vs. fatigue (Insomnia).

If indicators of these are noted, refer for a sleep study.

Cognitive-Behavioral Therapy for Insomnia (CBT-I)

- CBT-I is an evidence-based, short-term psychotherapy intervention alternative to sleep medications. Usual treatment duration is 4-8 visits (preferably weekly or bi-weekly) after the initial assessment.
- Research evidence has shown that it is equally effective as sleep medications in the short run, and has the advantage of being more effective as a long-term intervention for insomnia.

CBT-I Endorsements

- In May, 2016 the American College of Physicians published a Clinical Guideline paper relevant to the management of chronic insomnia in adults:
  “Recommendation 1: ACP recommends that all adult patients receive cognitive behavior therapy for insomnia (CBT-I) as the initial treatment for chronic insomnia disorder. (Grade: Strong recommendation, moderate-quality evidence)”

Cognitive-Behavioral Therapy for Insomnia (CBT-I)

- CBT-I Interventions are based on the 3P Model:
  - Predisposing factors for insomnia (e.g. rumination, cognitive style, medical issues, bed partner with incompatible sleep schedule, vocational issues that impact sleep schedule, etc.)
  - Precipitant of the insomnia (e.g. past stressful life event, otherwise resolved MDD)
  - Perpetuating factors for insomnia (i.e. typical insomnia coping behaviors that inadvertently stamp in insomnia)
  - Once insomnia becomes chronic, the precipitant is no longer relevant to the interventions.

CBT-I Endorsements

- The American Academy of Sleep Medicine’s 2008 clinical guidelines for treatment of insomnia listed CBT-I as a first-line standard of treatment. AASM is currently in process of developing clinical guidelines for the pharmacological treatment of insomnia, while continuing to recognize CBT-I as first-line.

Assess the patient for possible current underlying psychiatric disorder for which insomnia or complaints of poor sleep is a common symptom:

- Depression
- Anxiety disorders (GAD, Panic Disorder)
- Bipolar Disorder
- PTSD
- Night Eating Syndrome
- Substance abuse
CBT-I Targets

- CBT-I focuses on the behaviors that tend to maintain and perpetuate insomnia, rather than on the precipitant, and to some degree, on some of the predisposing issues (e.g. ruminative cognitive style).
- Essentially, many of these insomnia-maintaining behaviors are “common sense” but unfortunately create a dyssynchrony between the biology of sleep and sleep behavioral patterns.
- Other insomnia coping behaviors create increased arousal that is incompatible with sleep.

CBT-I Targets: What/Why?

Many insomnia behavioral adaptations impact adversely on the two primary biological sleep processes:

- Homeostatic Process (Process S)
- Circadian Process (Process C)

Homeostatic Process

- During the day, as more time elapses after waking, the sleep drive increases.
  - Adenosine accumulates in brain during waking hours
  - This increases sleep drive and causes sleepiness

- During sleep, as sleep progresses, the sleep drive decreases.
  - Adenosine stores in brain diminish
  - This decreases sleep drive and leads to alertness

Circadian Process

- The biological clock regulates sleep/wake by sending alerting signals of varying strength across the 24-hour day.
  - Alerting signals increase across the day starting at rise time
  - Alerting signals decrease across the night

Circadian Process

- Circadian rhythms are managed by the body’s internal clock in the suprachiasmatic nucleus of the hypothalamus, which is regulated in response to environmental patterns of light and darkness.
- Most biological processes run on their own internal 23+ hour circadian rhythms, which when working in concert, maintain the sleep/wake cycle.
- Environmental cues are also “zeitgibers” that entrain the sleep/wake cycle into a 24 hour rhythm.

Circadian Process

- The circadian rhythms most relevant to sleep are:
  - Core Body Temperature (runs a sine-wave pattern over a 24 hour period). Humans sleep best when their core body temperature is in the trough (lowest core temperature) of the sine wave.
  - Melatonin (basically stimulated around dusk by diminishing light, and minimally produced during daylight hours). Melatonin itself does not cause sleep, but sends a feedback message to the brain to prepare for sleep.
  - Grehlin (minimally produced at night which allows for sleeping 6-8 hours without being hungry)
**Common Insomnia Coping/Maintaining Behaviors**

- Extending Time In Bed well beyond biological sleep need to “catch up on sleep” (impacts both homeostatic and circadian issues). This is so common that a leader in the BSM field (Michael Perlis, Ph.D.) often refers to this behavior as the “mortal sin of insomnia”.
- Extended naps (reduces homeostatic pressure)
- Variable sleep schedule /“catch it when you can” (impacts both homeostatic and circadian processes).

**Conditioned Insomnia**

With repeated pairing of bed with wakefulness and high arousal

The bed becomes a cue for hyperarousal rather than sleep

Examples of classical conditioning can help patients understand this idea (e.g., Pavlov’s dog)

**Insomnia Anxiety Cognition as a Maintaining Factor**

- Sleep anticipatory anxiety (pre-sleep)
- Intrusive thoughts in bed (“Why can’t I sleep?” or other worry thoughts related to the next day’s functioning)
- Negative conceptualizations about sleep (e.g. dreading going to bed due to expectations of insomnia, perceptions of sleep as a battle to somehow be won)
- Catastrophizing at night about potential negative consequences of poor sleep. That may include:
  - Excessive health concerns associated with insomnia
  - Attributing perceived poor daily performance, negative mood, all indicators of low energy or fatigue, and any sense of diminished well-being as a function of poor sleep

**Excessive Sleep Effort**

- Preoccupation with sleep during day (anticipatory anxiety)
- Daytime avoidance behavior following poor sleep (e.g. cancelling plans, “resting”)
- Rigid sleep-related rules and rituals
- Clock watching (invariably triggers anxiety thoughts and arousal)
- Attempts to make oneself fall asleep thru some physical or mental activity (e.g. exhaust oneself, “count sheep” or other mental rituals)

**Conditioned Wakefulness**

In addition to the Pavlovian process that contributes to conditioned insomnia (via cognitive and physiological arousal becoming associated with the bed and bedroom), many other behaviors that are associated with wakefulness often become associated with the bed and bedroom, and can also become contributing insomnia factors due to weakening the association between bed/sleep.

- Although sleep is a biological function, it is also a function of classical conditioning processes, and any behavior that weakens the association between bed/bedroom and sleep (with a few exceptions) tends to weaken sleep drive.

**Conditioned Wakefulness**

Examples of problematic behaviors in the bedroom include:
- TV watching
- Use of laptops, tablets, smart phones, and other electronics
- Reading in bed
- Use of exercise machines in the bedroom
- Long conversations with bed partner

What behaviors are OK in the bedroom then?
- Sleep
- Sexual Activity
- Changing clothes
CBT-I Interventions: Sleep Restriction Therapy (SRT)

SRT (or an alternative known as Sleep Compression Therapy) attempts to reconnect sleep behavior with sleep biology. SRT requires the patient to keep nightly sleep log diary data, which provides data for interventions at each visit, and monitors progress. Its fundamental steps are:

- Set a standard daily rising time and get exposure to post-dawn early morning sunlight (about 10,000 lux). Contrary to sleep mythology, our internal circadian clock is calibrated by a standard rising time, not bed time, with exposure to this level of light (which is also the intensity of commercial light boxes for treating Seasonal Affective Disorder).

- In the initial step, limit time in bed (TIB) to the average sleep time from the prior sleep log, + 30 minutes. The patient is instructed to remain up until the designated time.

- The goal is to increase sleep efficiency by both calibrating the circadian clock and increasing homeostatic sleep pressure to push broken sleep into an efficient block (even if initially this is an insufficient total sleep time).

- In successive weeks, TIB is moved 15-30 minutes earlier each week until sleep efficiency falls below the target level; when that occurs, TIB is adjusted back to the prior week’s level (and this provides an estimate of biological sleep need).

Stimulus Control (SC) Interventions

- The purpose of SC interventions is to re-establish and strengthen the stimulus association between bed and sleep, and to disconnect the association of bed with cognitive and physiological hyperarousal, as well as with conditioned wakefulness.

- Many SC instructions are taught to patients as part of sleep hygiene instructions, but often without enough psychoeducation for the patient to “buy into” the concepts and actually follow them. Emphasize that these instructions are actually based on 100+ year old science (Pavlovian classical conditioning) that has stood the test of time. It is often useful to provide examples of other biological functions that can be classically conditioned (e.g. conditioned hunger).

- The purpose of getting out of bed if unable to sleep is to (a) interrupt likely rumination and arousal in bed that night, and (b) over time extinguish the association of rumination and arousal with the bed/bedroom.

- Move all behaviors associated with being awake out of the bed and bedroom (with the exception of sexual activity and changing clothes). And yes, that means the TV, tablet, and smart phone!

- Do not sleep in more than one place on a regular basis (e.g. recliners, couch). This also weakens the stimulus association between bed and sleep.

Cognitive Therapy (CT) Interventions

- CT interventions are the component shared with other CBT intervention protocols (e.g. for GAD, depression). However, the targets are generally sleep-specific anxiety thoughts relevant to inability to sleep, performance fears, health concerns related to insomnia, etc.

- The fundamental components are (a) Cognitive Restructuring strategies to challenge anxiety thoughts about sleep; and (b) Behavioral Experiments to test out maladaptive beliefs about sleep.
Cognitive Interventions

- Catastrophic thoughts/beliefs about insomnia are a major target of CT interventions. Some are easy to challenge (e.g. everyone has had days of having slept poorly but performed well in the day time, or conversely slept well but still felt unable to “get it together” that day).
- Thinking is a bad bed partner that needs to be divorced!

Psychoeducation

- Psychoeducation about the fundamentals of sleep often also helps to challenge sleep anxiety and normalize perceived problems. For example, many people believe that any middle awakening is a sign of poor sleep quality, but the data shows that middle awakenings are common at all developmental ranges and increase with age (particularly starting in the 40’s and beyond).
- Also, the proportion of NREM slow wave sleep (Delta sleep) gradually reduces after the 20’s until the late 60’s; this is the part of the sleep cycle that contributes to feeling rested. As such, as we age our sleep naturally gets more broken and less restorative.

Relaxation Training (RT)

RT interventions are ancillary interventions that may be used in CBT-I. The purpose is to reduce arousal that may interfere with sleep onset or assist in returning to sleep. RT interventions are not an effective stand-alone monotherapy for chronic insomnia. Examples include:
- Controlled Diaphragmatic Breathing
- Progressive Muscle Relaxation
- Emotive Imagery
- Autogenic Relaxation

Medication Withdrawal

- The ultimate goal of CBT-I is to successfully withdraw the patient from sleep medications.
- There are differences of opinion in the field as to when to initiate the taper schedule (before CBT-I, during, or after), with no established empirical guideline as to which is best.
- Taper schedules are conducted in collaboration with the prescribing provider.
- Taper schedules are generally very gradual and much slower than PDR guidelines, to reduce any rebound insomnia and increase self-efficacy relevant to the ability to sleep naturally.
- If there is more than one sleep medication, benzodiazepines are generally the first to be withdrawn.

CBT-I Sleep Regulation Goal

Strong Sleep Drive
+ Low Arousal
+ Correct Timing
= GOOD SLEEP

Who is a Good CBT-I Candidate?

Patients with chronic insomnia who have:
- Expressed an interest in natural sleep without medications
- Indications for the types of maladaptive sleep coping behaviors and/or sleep anxiety issues outlined above
- Failed several sleep medications and/or continue to need escalating doses
- Are willing to consider an alternate treatment protocol
- Chronic pain or medical issues do not contraindicate use or CBT-I, which has been shown to be effective in chronic pain populations.
Final Note: Differentiating Insomnia vs. Circadian Rhythm Sleep-Wake Disorders

- Sometimes a circadian phase disorder masquerades as insomnia
- Circadian phase disorders are typically delayed (Night Owl) but can also be advanced, especially in the elderly (Lark). Delayed rhythms are also normal for adolescents
- In those cases, patients may report no sleep problems if allowed to sleep on their preferred schedule (e.g. on weekends)

Other BSM Interventions

Behavioral Sleep Medicine interventions are also established to address a variety of other sleep disorders. Those include:

- Non-adherence with CPAP therapy (CPAP exposure protocol and motivational enhancement interventions)
- Circadian Rhythm Sleep-Wake Disorders
- Parasomnias (sleep walking, sleep terrors)
- Management of Night Shift sleep and Jet Lag
- Nightmare (non-PTSD) Disorder (Imagery Rehearsal Therapy)