

Patients with Insomnia: Perioperative Considerations

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Objectives

- Define insomnia
- Discuss the epidemiology and prevalence of insomnia
- Review the pathophysiology and consequences of insomnia
- Discuss therapies for insomnia
- Consider the implications of insomnia and its therapy in the perioperative setting

What is Insomnia?

- ICSD-3 Definitions
 - Short-term insomnia
 - Chronic insomnia
 - Other insomnia
- DSM-V Definitions

Short-term Insomnia (ICSD-3)

- All criteria must be met (A-E)
 - A. The patient, patient's parent or caregiver observes/ reports one or more of the following:
 1. Difficulty initiating sleep
 2. Difficulty maintaining sleep
 3. Waking up earlier than desired
 4. Resistance to going to bed on appropriate schedule
 5. Difficulty sleeping without parent or caregiver intervention

Short-term Insomnia (ICSD-3)

B. The patient, patient's parent or caregiver observes/
reports one or more of the following:

1. Fatigue/malaise
2. Attention, concentration, or memory impairment
3. Impaired social/family/vocational/academic performance
4. Mood disturbance/irritability
5. Daytime sleepiness
6. Behavioral problems (e.g. hyperactivity, impulsivity)
7. Reduced motivation/energy/initiative
8. Proneness for errors/accidents
9. Concerns about or dissatisfaction with sleep

Short-term Insomnia (ICSD-3)

- C. The reported sleep/wake complaints cannot be explained purely by inadequate opportunity (i.e. enough time is allotted for sleep) or inadequate circumstances (i.e. the environment is safe, dark, quiet, and comfortable) for sleep.
- D. The sleep disturbance and associated daytime symptoms have been present for less than three months.
- E. The sleep/wake difficulty is not better explained by another sleep disorder.

Chronic Insomnia (ICSD-3)

- All criteria must be met (A-F)
 - A-C. Same as for Short-term Insomnia
 - D. The sleep disturbance and associated daytime symptoms occur at least three times per week.
 - E. The sleep disturbance and associated daytime symptoms have been present for at least three months.
 - F. The sleep/wake difficulty is not better explained by another sleep disorder.

Chronic Insomnia (DSM-V)

- All criteria must be met

A-D, F. Same as for ICSD-3 Chronic Insomnia.

In addition:

- Chronic = more than 1 month
- Not attributable to the physiological effects of a substance (e.g. a drug of abuse, a medication)
- Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia

Insomnia Diagnosis

- Making the diagnosis is complex
- Should not be confused with volitional or circumstance-related insufficient sleep (e.g. difficulty sleeping in the hospital)
- Screening tools are not widely utilized
 - Insomnia is frequently undiagnose
 - Undiagnosed patients may be prone to self-treat

Insomnia Severity Index

Please rate the *CURRENT* (i.e. *LAST 2 WEEKS*) *SEVERITY* of your insomnia problem(s).

Insomnia Problem	None	Mild	Moderate	Severe	Very Severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problems waking up too early	0	1	2	3	4

4. How **SATISFIED/DISSATISFIED** are you with your **CURRENT** sleep pattern?

Very Satisfied Satisfied Moderately Satisfied Dissatisfied Very Dissatisfied
0 1 2 3 4

5. How **NOTICEABLE** to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all A Little Somewhat Much Very Much Noticeable
0 1 2 3 4

6. How **WORRIED/DISTRESSED** are you about your current sleep problem?

Not at all A Little Somewhat Much Very Much Worried
0 1 2 3 4

7. To what extent do you consider your sleep problem to **INTERFERE** with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) **CURRENTLY**?

Not at all A Little Somewhat Much Very Much Interfering
0 1 2 3 4

No insomnia (<8)

Moderate insomnia (15-21)

Subthreshold insomnia (8-14)

Severe insomnia (>21)

Athens Insomnia Scale

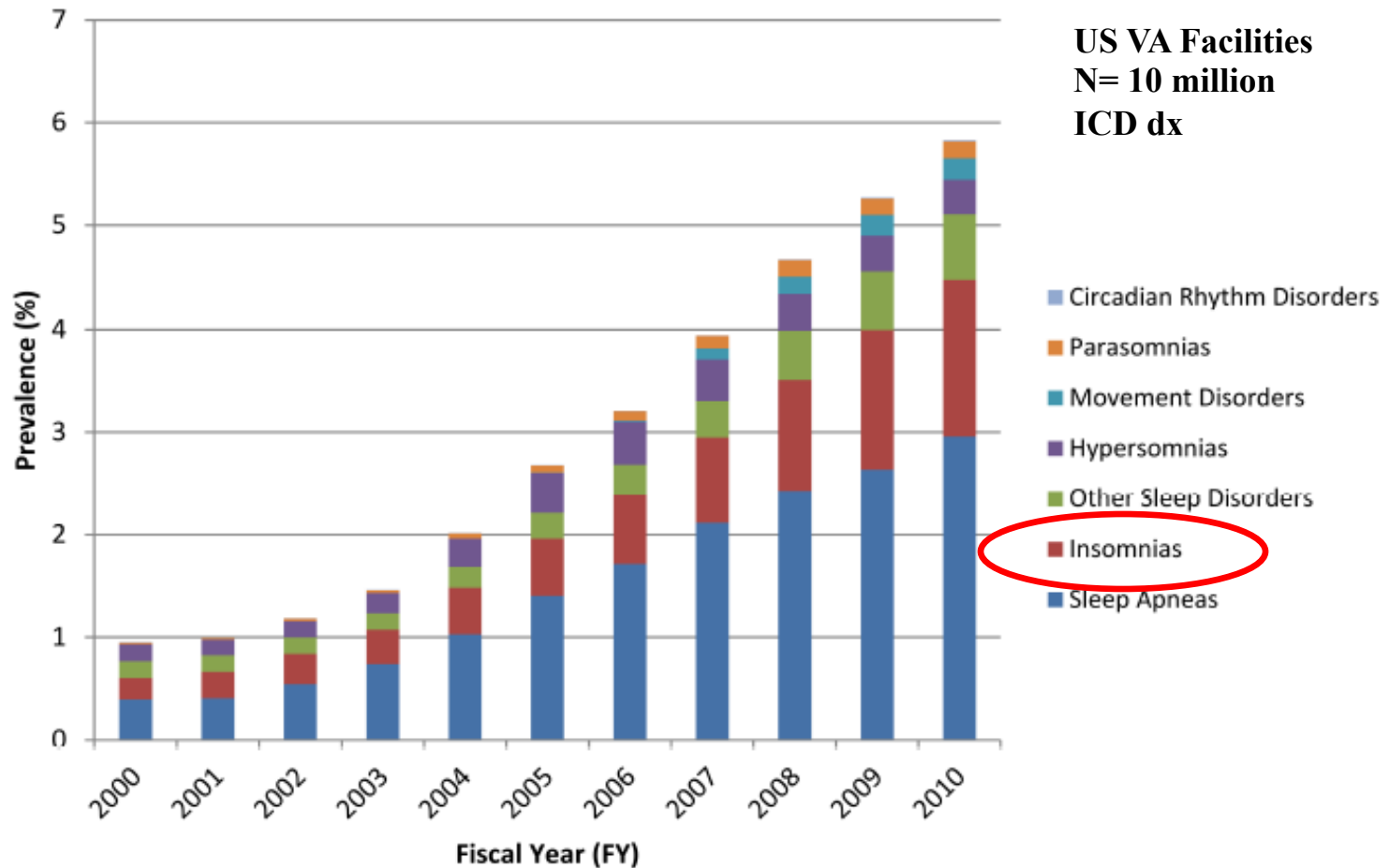
Sleep factors	Athens insomnia scale			
Sleep induction	0: No problem	1: Slightly delayed	2: Markedly delayed	3: Very delayed or did not sleep at all
Awakenings during the night	0: No problem	1: Minor problem	2: Considerable problem	3: Serious problem or did not sleep at all
Final awakening	0: Not earlier	1: A little earlier	2: Markedly earlier	3: Much earlier or did not sleep at all
Total sleep duration	0: Sufficient	1: Slightly insufficient	2: Markedly insufficient	3: Very insufficient or did not sleep at all
Sleep quality	0: Satisfactory	1: Slightly unsatisfactory	2: Markedly unsatisfactory	3: Very unsatisfactory or did not sleep at all
Well-being during the day	0: Normal	1: Slightly decreased	2: Markedly decreased	3: Very decreased
Functioning capacity during the day	0: Normal	1: Slightly decreased	2: Markedly decreased	3: Very decreased
Sleepiness during the day	0: None	1: Mild	2: Considerable	3: Intense

Insomnia = ≥ 6

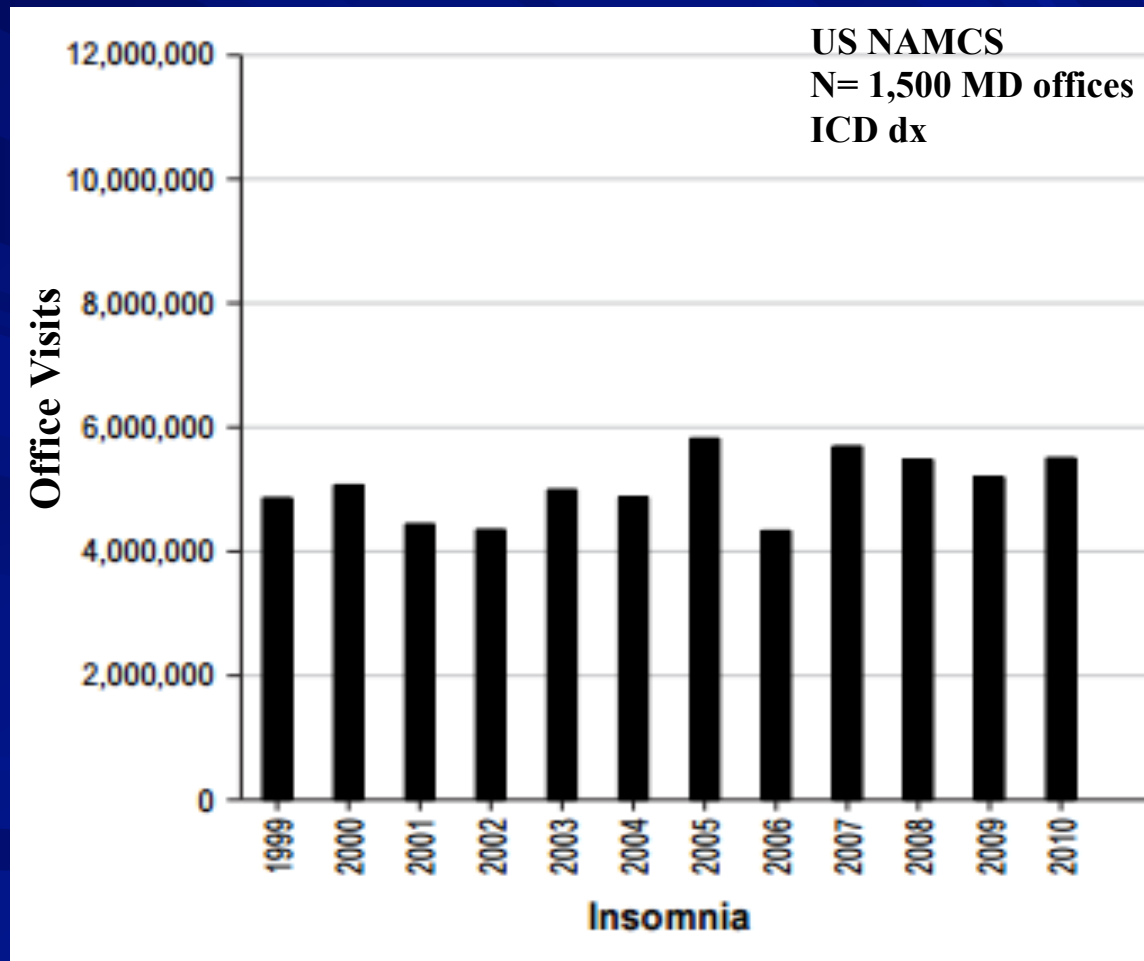
Insomnia Prevalence

- 1985: A national survey of noninstitutionalized adults found:
 - 35% reported insomnia in the previous year
 - Nearly 50% of these described the insomnia as seriousMellinger et al, Arch Gen Psych 1985
- 1999: A survey of primary care patients found:
 - 69% reported insomnia
 - 50% had occasional insomnia, 19% had chronic insomniaShochat et al, Sleep 1999
- 2002: A review of 50 studies found:
 - 10% of individuals develop chronic insomnia with related daytime consequences

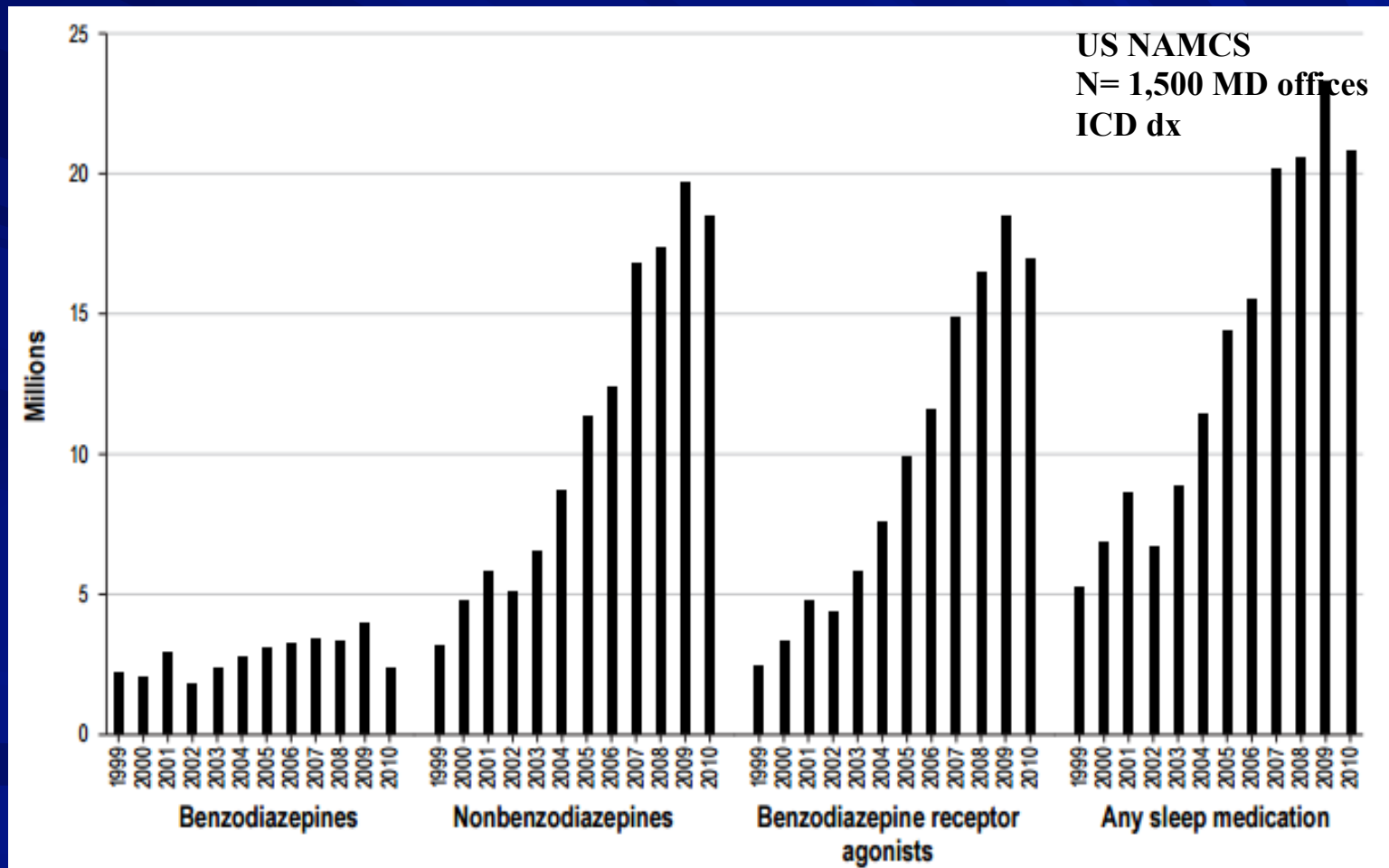
Insomnia Prevalence



Insomnia Prevalence



Insomnia Prevalence

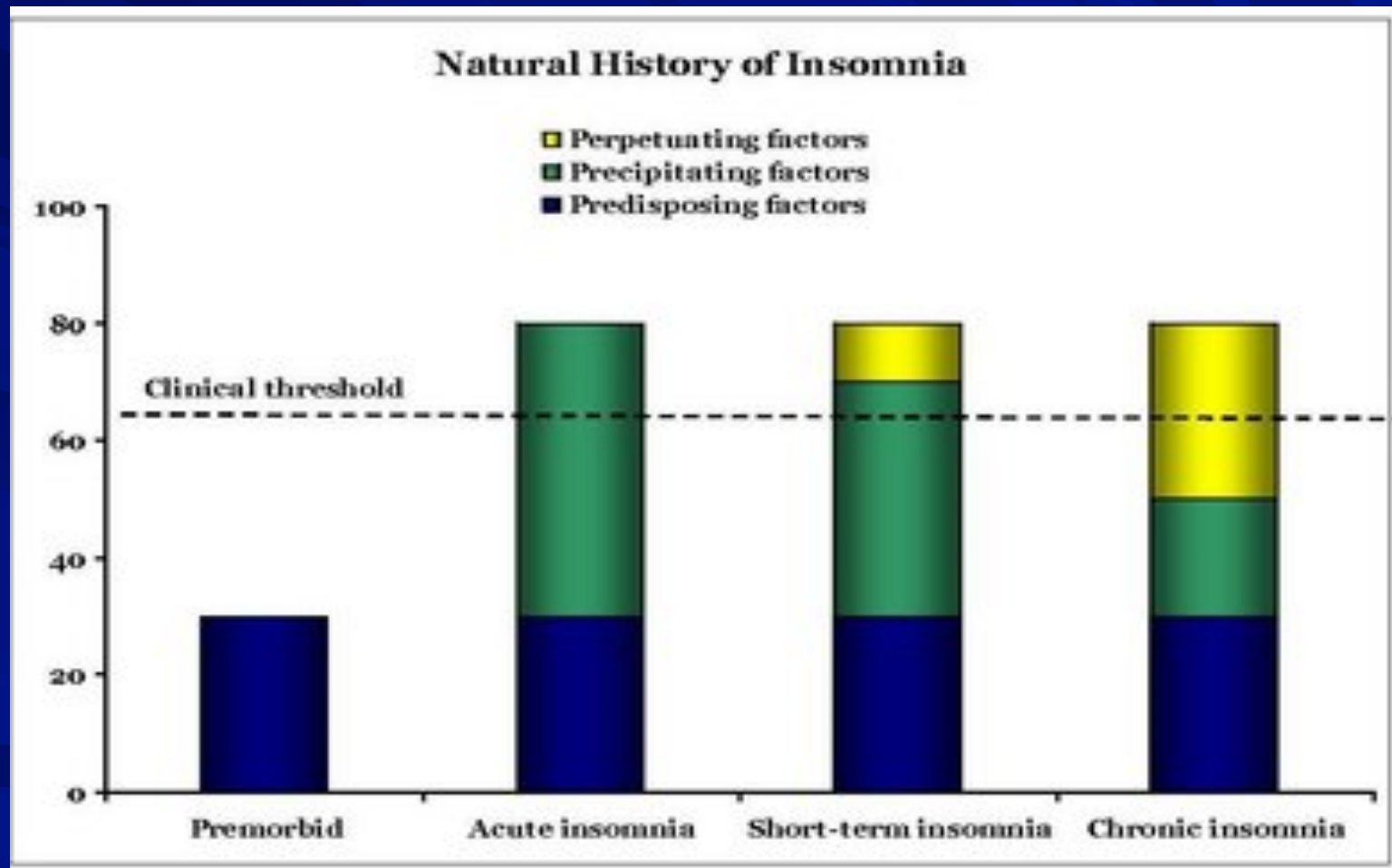


Insomnia Epidemiology

- Increases with age
- More common in women (50%)
- More common in unemployed, lower socioeconomic status and separated/divorced/widowed.
- Often associated with co-morbid
 - Psychiatric conditions (depression, anxiety, PTSD)
 - Substance abuse
 - Medical conditions (pulmonary, CHF, HTN, DM, cancer and chronic pain conditions)

Insomnia Pathophysiology

The 3 Ps of Insomnia



Spielman et al, Case Studies in Insomnia 1991

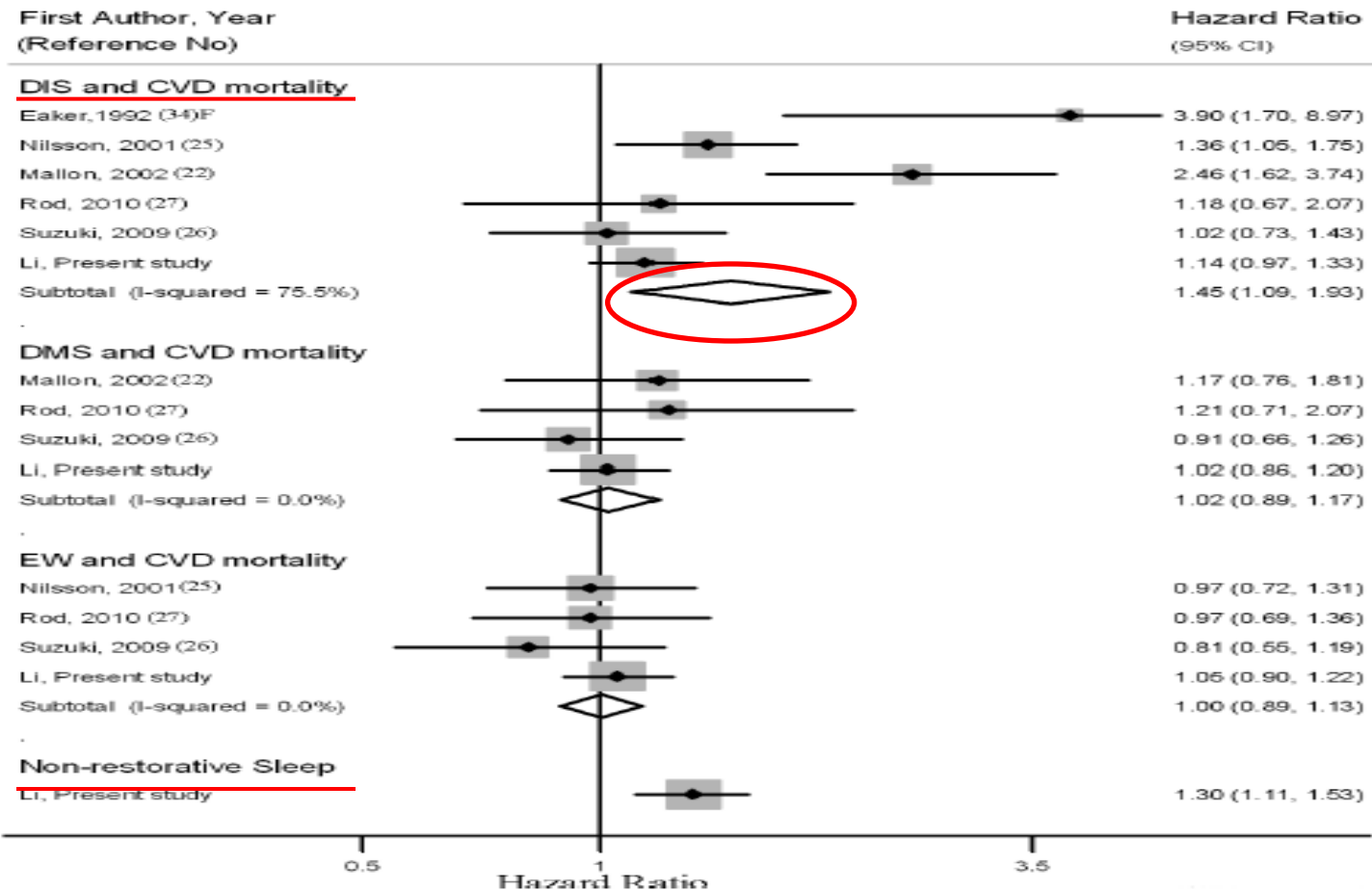
Insomnia Pathophysiology

- Hyperaroused state
- Increased heart rate and altered heart rate variability
- Increased whole-body metabolic rate (cortisol, ACTH) (particularly near sleep onset)
- Increased body temperature
- Increased high-frequency EEG activity during NREM sleep
- No discrete structural brain pathology can be identified in most individuals with insomnia

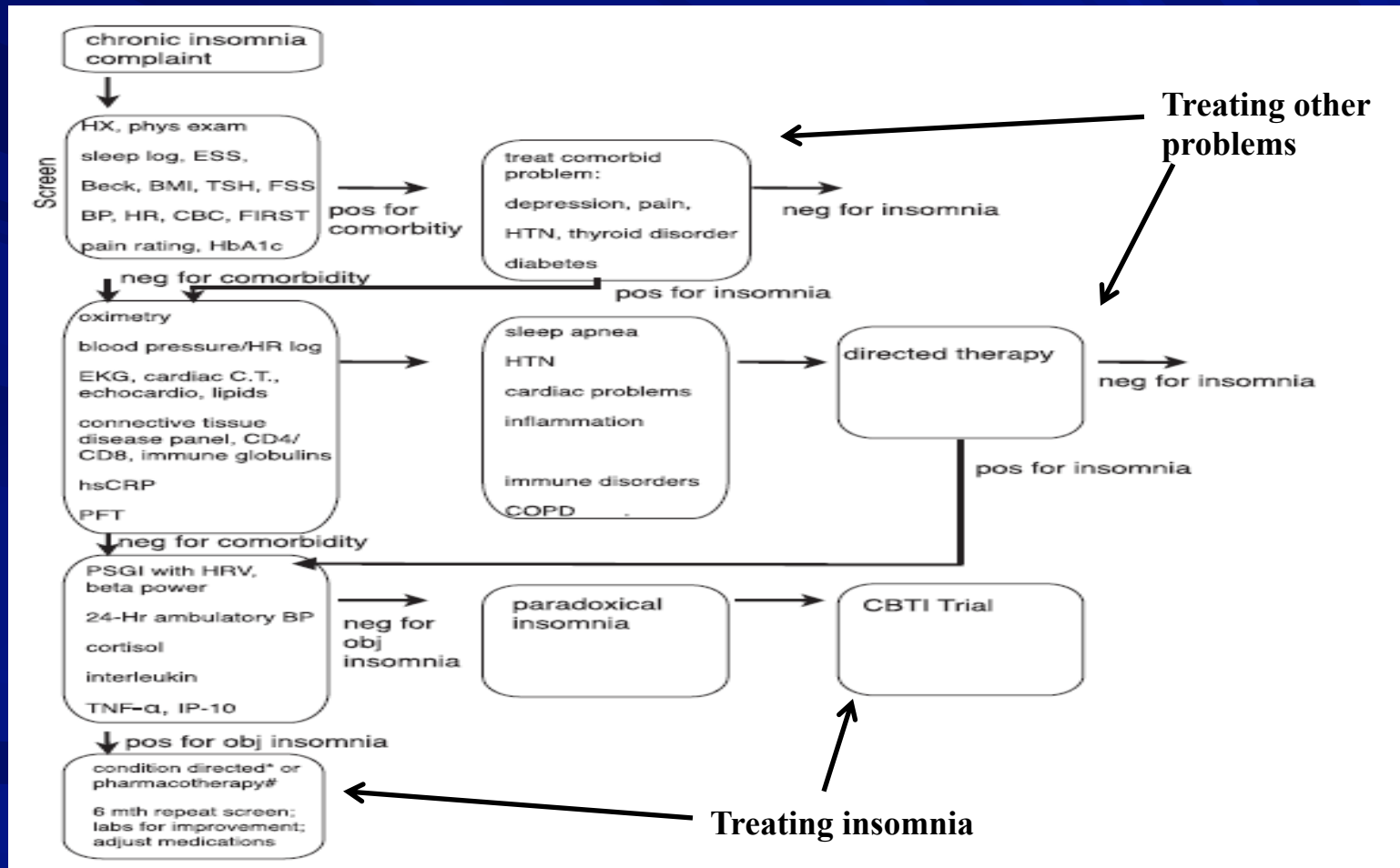
Insomnia Consequences

- Mortality
- CV risk
 - HTN, non-dipping blood pressure pattern at night
(improves with treatment)
 - MI
- DM
- Anxiety and depression
- ? lowers pain threshold
- Prolonged use of prescription or OTC sleep aids
- Work disability

Insomnia Consequences Mortality



Insomnia Therapy



Insomnia Therapy

Cognitive Behavioral Therapy – Insomnia (CBT-I)

- Encompasses a variety of interventions / counseling as a package, usually over serial visits over 6-8 weeks
 - Sleep Hygiene
 - Stimulus control
 - Relaxation techniques
 - Sleep restriction
 - Cognitive therapy
- Moderate to highly effective therapy, persistent effects (1 yr), and generally recommended as 1st line therapy
 - ACP Guideline: Grade: Strong QOE: Moderate
Qaseem et al, Ann IM 2016
- Not available everywhere and not all patients willing

Insomnia Therapy

Benzodiazepines

- Bind to several GABA type A receptors
- Reduce sleep latency and awakenings, and increase TST
- Common drugs

	$T_{1/2}$
• Triazolam (Halcion)	2-5 hrs
• Estazolam (Prosom)	10-24 hrs
• Temazepam (Restoril)	8-15 hrs
• Flurazepam (Dalmane)	40-114 hrs
- All hepatically metabolized (CYP3A4)
- SE: daytime sleepiness, ***cognitive impairment, motor incoordination, worsen OSA, and respiratory depression***
 - ***Rebound insomnia*** can occur with withdrawal

Insomnia Therapy

NonBenzodiazepine receptor agonists

- Targets single GABA type A receptor
- Reduce sleep latency and awakenings, and increase TST
- Common drugs

	$T_{1/2}$
• Zaleplon (Sonata)	1 hr
• Zolpidem (Ambien, Intermezzo)	1.5-4.5 hrs
• Eszopiclone (Lunesta)	6-9 hrs
- All hepatically metabolized (CYP3A4)
- SE: daytime sleepiness, ***cognitive impairment, motor incoordination***, and complex sleep-related behaviors
 - ***Inpatient: increased fall risk and increased delirium***
 - ***Rebound insomnia*** can occur with withdrawal

Insomnia Therapy

Melatonin receptor agonist

- Targets melatonin receptors
- Reduces sleep latency and increases TST (though marginally)
- Common drug
 - Ramelteon (Rozerem) $T_{1/2}$ 1.5-3 hrs (2-5 hrs)
- Hepatically metabolized (CYP1A2)
- SE: somnolence, dizziness, HA
 - No withdrawal or rebound insomnia

Insomnia Therapy

Antidepressants

- Tricyclic antidepressants (TCAs) have sedation as a SE
- Decrease wake time after sleep onset, increase TST
- Common drugs
 - Doxepin (Silnor, Sinequan) $T_{1/2}$ 15 hrs (31 hrs)
 - Amitriptyline (Elavil)* 10-15 hrs
- Hepatically metabolized (CYP2D6)
- SE: somnolence, nausea, HA, *arrhythmias(A)*
 - May see withdrawal syndrome or *rebound insomnia*

* Not FDA approved

Insomnia Therapy

Antidepressants

- Serotonin modulator trazodone has sedation as a SE
- Reduce sleep latency and awakenings, and increase TST
- Common drug
 - Trazodone (Desyrel) $T_{1/2}$ 7-10 hrs
- Hepatically metabolized (CYP3A4)
- SE: somnolence, ***confusion***, dizziness, nausea, dry mouth, HA
 - ***Othostatic hypotension, arrhythmias***
 - May see ***severe withdrawal syndrome***

Insomnia Therapy

Orexin receptor antagonist

- Orexin receptor antagonists are a new and novel therapy
- Reduce sleep latency and awakenings, and increase TST
- Common drug
 - Suvorexant (Belsomra) $T_{1/2}$ 12 hrs
- Hepatically metabolized (CYP3A4)
- SE: somnolence, HA, narcolepsy-like sxs
 - *May worsen OSA*
 - *Rebound insomnia* can occur with withdrawal

Insomnia Therapy

Over-the-counter medications

- Most OTC preparations contain an antihistamine, melatonin or herbal product
- Little evidence for their clinical effectiveness
- Common drugs

	$T_{1/2}$
• Diphenhydramine (“PM”)	8.5 hrs
• Doxylamine (Unisom)	10-13 hrs
• Melatonin	< 1 hr
• Valerian (Sleep Aid)	?
- Hepatically metabolized
- SE: mostly antihistamines – somnolence, ***cognitive impairment, delirium, anticholinergic effects***

Insomnia and Perioperative Considerations

- Insomnia is common and perioperative providers will see patients with insomnia
 - It is not expected that perioperative providers screen for or diagnose insomnia
- The impact of the baseline hyperarousal state on perioperative care is uncertain
 - ? effect BP control
 - ? effect DM control
 - ? impact anxiety
 - ? impact pain control

Insomnia and Perioperative Considerations

- The perioperative provider should be aware of insomnia therapies (*prescribed or self-medicated*)
 - Many medications have side effects relevant to the perioperative environment (*CNS, cardiac and pulmonary effects*)
 - Some side effects may be enhanced in the inpatient environment
 - Drug-drug interactions exist
 - Watch for overlapping effects with opioids
 - However, abruptly stopping therapies may have deleterious effects
 - *Beware of ETOH used as a sleep aid*

Insomnia and Perioperative Considerations

- Concerns about use or discontinuation of insomnia medications in the perioperative time period, preoperative consultation with the prescriber and/or sleep specialist may be warranted
- Enhanced monitoring may be considered in select patients on sedatives
 - Significant pain medication requirement
 - Older individuals (> 65 yrs old)
 - Those with significant co-morbid conditions (e.g. OSA, COPD, CHF, liver disease)

Insomnia and Perioperative Considerations

- Insomnia and OSA frequently coexist!
 - 30-70% of patients with OSA will have co-morbid insomnia
 - Screening for OSA in patients with insomnia should be considered (preoperative clinic or otherwise)
 - Co-morbid insomnia may be a significant factor in PAP compliance

Insomnia and Perioperative Conclusions

- Insomnia is common in surgery patients
- It is uncertain if insomnia itself will increase perioperative complications
- Common therapies for insomnia have the potential to impact perioperative care
- Insomnia often co-exists with OSA
- Further work is needed is needed in this field

Society of Anesthesia & Sleep Medicine

<http://www.sasmhq.org>

Thank You