



Sleep Disturbance and Chronic Pain

Breaking the Vicious Cycle

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Presenter Disclosures

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Overview

1. topic: sleep loss and pain as bedfellows
2. scope: chronic pain and insomnia
3. focus:
 - a. overview of sleep loss and pain
 - b. screening for sleep concerns in pain patients
 - c. managing sleep concerns in pain patients
4. purpose: toward a new conceptual model

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Some common factors in sleep & pain disorders



- chronic inflammation
- hyperarousal
- weight gain and obesity
- secondary gain
- clinical depression
- disrupted circadian rhythms
- more women affected

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The sleep disorders epidemic



- **insomnia – 60 million¹**
- **obstructive sleep apnea (OSA) – 18 million¹**
- **64% report sleep problems a few nights/week or more²**
- significant rise has been noted in recent years²
- **two-thirds of chronic pain patients have disrupted sleep³**

1. National Institute of Neurological Disorders and Stroke, 2007

2. National Sleep Foundation, Sleep in America Poll, 2009

3. National Sleep Foundation; www.sleepfoundation.org/article/ask-the-expert/pain-and-sleep

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Sleep loss, illness and inflammation

Short sleepers (=/ < 6h/night) are at increased risk for:



- viral infections
- obesity
- diabetes
- cardiovascular disease
- cancer
- depression

➔ **chronic inflammation is a key factor in both sleep loss & pain**

Abad V, Sarinas P, Guilleminault C. *Sleep Medicine Reviews* (2008) 12(3), 211-228

MR, et al. *Biological Psychiatry*. 2008; 64(6)

Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, Pa: Elsevier Saunders; 2005.

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The Sleep Disordered Human



cognitive deficits & depression

(insomnia increases risk of MDD two-fold)¹

hyperarousal

(insomniacs show increased metabolic rate over 24-hr cycle)²

snoring and sleep apnea

counterfeit energy dependent

metabolic syndrome / weight gain

1. DJ; Angst J; Gamma A; Ajdacic V; Eich D; Rössler W. *SLEEP* 2008;31(4):473-480.

2. Riemann D, Voderholzer, U. *Journal of Affective Disorders*, 2003; 76(1-3) 255-259

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LAN - "The planet has a fever." -- Al Gore

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The brain on sleep deprivation

Springfield Radiology Center

PT: Homer Simpson
Referred by: R. R.Naiman
Physician: Ray Gunn, MD MRI
05/21/04

Major complaint: chronic EDS
and significant cognitive deficits
R/O insomnia and OSA



Homer Simpson 067845-778 05/21/04 Dr. Flanagan

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Pain increases the risk for insomnia

- 50 - 90% of chronic pain pts have insomnia
- increased sleep onset latency
- increased stage shifts
- decreased deep sleep
- increased arousals
- decreased REM sleep
- EDS, fatigue, cognitive impairment



Stepanski, EJ, Walker, MS, Schwartzberg, LS, Blakely, LJ, Ong, J, & Houts, AC. *Journal of Clinical Sleep Medicine*. Vol.5, No. 2, 2009

Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, Pa: Elsevier Saunders; 2005.

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Gating mechanisms in sleep and REM



- sleep raises pain threshold peripherally and in brain
- pain threshold is further increased in REM sleep

Roehrs TA, Blaisdell B, Greenwald MK, Roth T. Pain threshold and sleep loss. *Sleep*. 2003;26(suppl):A196.

Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, Pa: Elsevier Saunders; 2005.

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Sleep phase dysrhythmias

- The period of time during which our brain and body want to sleep
- Sleep phases may be *entrained* with nature or culture or subculture
- Sleep phases may be regular, delayed, or advanced

Major circadian rhythm disorders include:



- Advanced sleep phase
- Delayed sleep phase
- Irregular sleep phase
- Jet lag syndrome
- Shift work syndrome



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An historical view of sleep

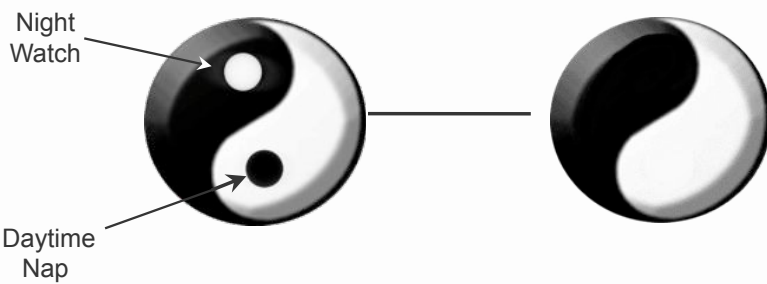
- Prior to ~1830, sleep occurred in two phases*
- First sleep, *night watch*, and second sleep *
- Napping was more common*
- Research suggests this historic pattern may be natural**
- Raises question about “normal” insomnia**

*A. Roger Ekirch, *Virginia Polytechnic Institute*

** Thomas Wehr, *National Institute of Mental Health study*

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The demise of *yin-yang*-- natural rhythms



- 1) With increased pressure to be awake through the day, we lost our naps.
- 2) With increased sleepiness, we had to begin sleeping through the night, losing night watch.

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Circadian factors in pain

Biological rhythms can influence:

- sleep onset and maintenance the perception of pain
- the activity of analgesics
- no circadian variation in acute pain

Perception of chronic pain varies with time of day:

- arthritis is worse in the morning
- muscle pain increases in the afternoon
- torticollis pain is relieved by sleep

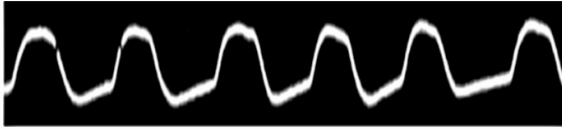


Uwe Junker-Stefan Wirz, *Chronobiology: influence of circadian rhythms on the therapy of severe pain, Journal of Oncology Pharmacy Practice 2009 doi:1*

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Losing our sleep-wake variability

From a naturally robust pattern :



.... toward “flat-lining:”



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Etiological factors in insomnia

1. Predisposing factors...

- drugs, medications, esp. alcohol, caffeine, nicotine
- nocturnal pain or discomfort
- primary sleep disorders: OSA, RLS, PLMS, GERD
- sleep phase/rhythm problems, shift work, chronic jet lag
- psych factors: type A, depression, anxiety, PTSD, OCD

2. Precipitating factors... STRESS...

3. Perpetuating factors...

- excessive time in bed
- irregular sleep/wake schedule, napping, dozing
- caffeine, alcohol, drugs
- anxiety about daytime consequences
- hypnotics use and rebound effects
- secondary gain: the ‘daze of our lives’

Kryger MH, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. Philadelphia, 17 Pa: Elsevier Saunders; 2005.

Screening and evaluation

- ➔ Integrative: bio-psycho-social-environmental
- ➔ Evaluate extent of EDS
- ➔ Evaluate fatigue
- ➔ Screen for OSA, PLMS, RLS, GERD
- ➔ Evaluate impact of medications on sleep
- ➔ Sleep history – have patients tell their sleep stories
- ➔ Sleep diaries, logs, rating scales: ESS
- ➔ Polysomnography



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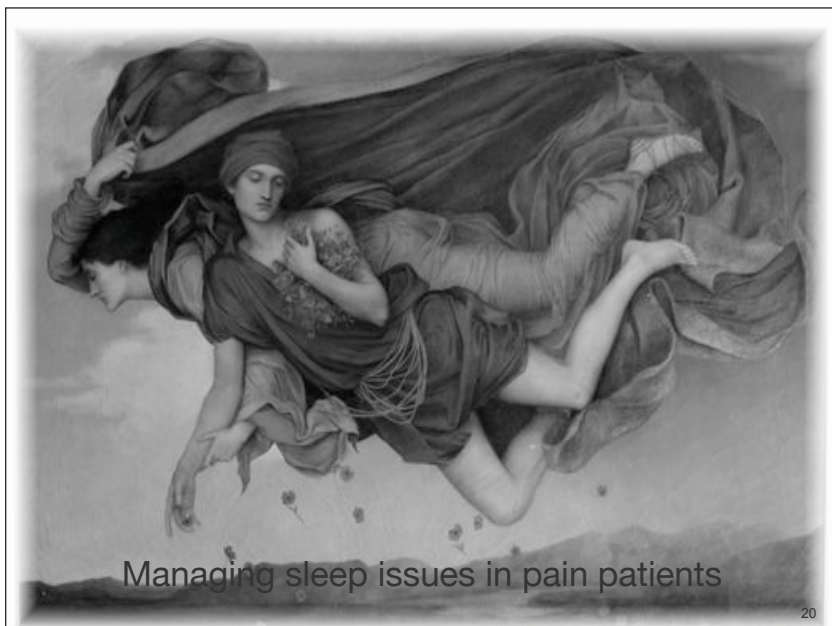
Assessing one's 'night stand'

- lighting
- telephones
- fluids
- PDAs
- medications
- reading material
- clock radio
- paraphernalia
- foods
- other things...



What do we carry with us on our overnight journey into sleep?

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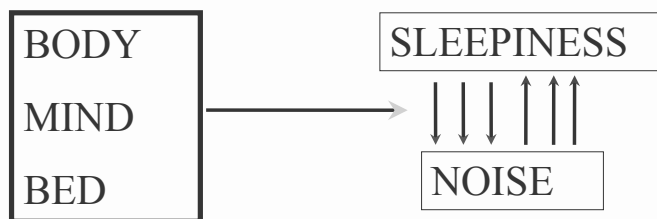


Managing sleep issues in pain patients

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MIMI

Model for the Integrative Management of Insomnia



BODY – Biological, medical, nutritional, other physical factors

MIND – Psychological, psychosocial, behavioral factors

BED – Environmental factors, the bed and bedroom

➔ *Provide patients with a face valid conceptual model*

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The princess and the pee

*What really keeps us up
at night?*

... the dynamic interplay
of sleep and noise



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Nine arenas of insomnia management

● BODY

- 1) lifestyle: nutrition, substances, exercise and life rhythms
- 2) medical conditions and symptoms: pain and discomfort
- 3) medication issues: sleep side effects

● MIND

- 4) cognitive behavioral therapy: managing thoughts
- 5) meta-cognitive issues: understanding deeper beliefs
- 6) shifting consciousness: addressing spiritual issues

● BED

- 7) physical sleep environment: sleep space and time
- 8) subtle sleep environment: chemical and energy factors
- 9) social sleep environment: "sleeping together"

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"Taking something
to sleep..."
(pushes sleepiness)



vs.



"Letting go of
something to sleep"
(reduces noise)

Taking or letting go of something for pain?

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Taking medication to sleep...



Rx & OTC
hypnotics

- dependency
- alteration sleep architecture
- residual “hangover”
- rebound insomnia with d/c
- anterograde amnesia
- impact on self-efficacy?
- limited effectiveness¹
- increased mortality?²

1. Buscemi N, Vandermeer B, Friesen C, Bialy L, Tubman M, Ospina M, Klassen, TP, Witmans M; J Gen Intern Med. 2007 September; 22(9): 1335–1350.

2. Kripke, D. *Sleep Medicine*, 2009, (10)3:275-276

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Using alternative substances to sleep...



- Tryptophan
- 5-HTP (5-Hydroxytryptophan)
- Valerian
- Other Botanicals
- Proprietary Blends
- Melatonin....



Attele AS, JT, Yuan, C, *Medicine Review*, 2000: 5(3) 249-259

Sánchez-Ortuño M, Bélanger L, vers H, eBlanc M, Morin C, *Sleep Medicine*, 2009: 10(9) 982-987

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Letting go of “body noise” to sleep

‘Sleep hygiene’

- Keep a regular sleep-wake schedule
- Evaluate sleep side effects of meds
- Manage caffeine, nicotine, alcohol
- Avoid exercise 3 - 4 h prior to bed
- Avoid high glycemic foods as snacks
- Manage GERD, PLMS, RLS



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Letting go of "body and mind noise"

Sleep induction practices

- Mindfulness meditation
- Muscular relaxation
- Heart rate variability - Em wave
- Breathing: 4-7-8 breath
- Self-hypnosis
- Guided imagery
- Gentle yoga
- Lightheartening / laughter



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Letting go of "mind noise"

1. Sleep impeding thoughts
- cognitive behavioral tx
2. Sleep impeding beliefs
- metacognitive shifts
3. Determined to control
- spiritual surrender

*Nothing puts an insomniac to sleep
like knowing its time to get up.*



CartoonChurch.com

National Institutes of Health Statement Regarding the Treatment of Insomnia. *Sleep*. 2005;28:1049-1057.

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Pathologizing insomnia vs. forgiving nighttime wakefulness...



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A fundamental meta- cognitive shift:



- The waking mind is
 - *active, productive, intentional*
- The night mind
 - *restful, reflective, receptive*
- We import waking into night
 - *like sleeping in your clothes*
- We cannot understand night by using a flashlight

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What is “a good sleeper?”

“It has always been a family joke ... about our sleep patterns. Nothing seems to keep us awake. We are notorious sleepers. I hit the pillow and I am out. ... My brother Harold falls asleep while driving.”

-- N. A., Chicago

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Letting go of waking to sleep...



- Cranking up sleepiness
- We cannot “go to sleep”
- We can *let go of waking*
- an act of faith?

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Letting go of "bed noise"

Stimulus control therapy

Reinforces association of bed & bedtime with *sleep*

- ♦ Use bed for sleep & sex only
- ♦ Go to bed only when sleepy
- ♦ If sleep onset > 15 – 20 min, get out of bed until drowsy
- ♦ Avoid naps until nighttime sleep is normal



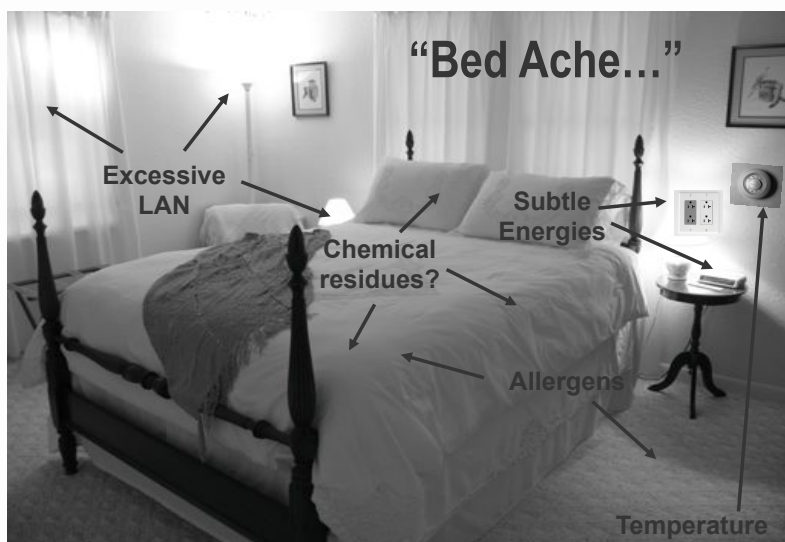
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Letting go of 'bed noise' to sleep

Keep the bedroom

- 1) cool ...
- 2) dark ...
- 3) quiet ...
- 4) safe ...
- 5) green ...

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Do we become physically tethered to the waking world? 36



Dusk simulation

Method

- dim the lights 2-3 h before bed
- dim/shield monitors
- use book lights for reading
- install black out drapes
- cover appliance LED lights
- use motion detector night lights

Challenges

- letting go of activity
- deep introversion
- emergence of shadow issues

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“Blue-less” technology



TV's &
computer
monitors
emit
significant
blue light

Filters out
the blue
wavelength
of light that
suppresses
melatonin

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My bedroom at night

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Evening Ritual

◇ bringing it all together ◇

- Practice a transitional evening ritual 1-2 h before bed in dim light
- Warm bath or spa as transition through evening cleansing
- Use gentle yoga or stretching to release muscular tension
- Journal with attention to sleep cognitions and beliefs
- Engage in meditation, prayer, other relaxation or spiritual practices
- Take time for social relaxation with family, friends or partner
- Consider lighthearted literature or 'blue-blocked' television

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The big questions:

What is sleep?

What is pain?

What is consciousness?



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Sleep is serenity



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