Sleep in Pregnancy and Postpartum
Implications for Mood

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Perinatal women face a wide range of sleep problems.
Objectives for today

1. Understand why poor sleep during the perinatal period is a critical problem that is worthy of our attention
2. Learn strategies for improving mild sleep problems
3. Become familiar with the symptoms, screening tools, and treatment options for more severe presentations
% Poor Sleepers
(Pittsburgh Sleep Quality Index score > 5)

# Months Pregnant
(a) Pregnant women*

- Mexican-American
- Non-Hispanic White
- Non-Hispanic Black

Prevalence (%)
- Very short (≤5 hours)
- Short (6 hours)
- Adequate (7-8 hours)
- Excess (≥9 hours)
Normative sleep disturbances during pregnancy

- Influenced by hormonal changes
  - Progesterone increases sleepiness, induces smooth muscle relaxation (frequent urination, heartburn, nasal congestion), raises body temperature

- Disturbed by physical complaints:
  - Frequent urination (83%), uncomfortable (79%), back pain (59%), hip/pelvic pain (52%), reflux (45%) (Mindell et al., 2015)

- Disturbed by psychological complaints:
  - Vivid dreams (44%); worries about baby (39%), pregnancy (38%), and labor/delivery (23%) (Mindell et al., 2015)
Figure 1—Trajectory of sleep quality over time: four-group model.
Normative sleep disturbances during postpartum

- **Infant caregiving** (McBean et al., 2015)
  - 2.9 awakenings/night – stable from 0-26 weeks postpartum
  - 33.9 minutes/awakening – decreased from 0-26 weeks postpartum
- 81.5% reported using an electronic device
  - Mothers who used computer or watched TV had longer awakenings
- Improving infant sleep alone is not enough to improve maternal sleep
  - Maternal sleep not tightly coupled with infant sleep/feeding after 2 weeks postpartum (Sharkey et al., 2016)
Poor sleep has clear implications for mood

- Among non-perinatal populations:
  - Insomnia predicts depression (Baglioni et al., 2011)
  - Sleep deprivation predicts mania/hypomania among individuals with bipolar disorder (Leibenluft et al., 1996)
    - Women are particularly vulnerable to this effect (Lewis et al., 2017)
Poor sleep has clear implications for mood

- Among perinatal populations:
  - Poor sleep quality predicts depressive symptoms during pregnancy and postpartum (Felder et al., 2017; Skouteris et al., 2008; 2009) and (Tomfohr et al., 2015)
  - Poor sleep quality is associated with suicidal ideation during pregnancy (Gelaye et al., 2016)
  - Women with a history of sleep loss triggering mania may be at increased vulnerability to postpartum psychosis (Lewis et al., 2018)
‘I Killed My Children’
What Made Andrea Yates Snap?

Understanding Postpartum Depression
Anna Quindlen on Every Mother’s Struggle
Stigma of perinatal depression

• Public does not view depressed perinatal women negatively (Felder et al., 2017)

• Perinatal women fear depression stigma (Kopelman et al., 2008)

• Women with a history of depression are especially self-critical (Felder et al., 2016)

  § Sleep disturbance may be a less-stigmatized in-road for preventing and treating perinatal mood episodes
Sleep disturbances also have health consequences

- Poor sleep quality and short sleep duration (<6 hr) associated with gestational diabetes at 26-28 weeks (Cai et al., 2016)
- Short sleep duration (<6 hr) in 9th month associated with 4.5x higher risk of caesarean birth (Lee et al., 2004)
- Short sleep duration, poor sleep quality are associated with increased risk of preterm birth (Xu et al., 2014; Oyieng’o et al., 2016; Kajepreta et al., 2014; Micheli et al., 2011; Okun et al., 2011)
Sleep Disorder Diagnosis During Pregnancy and Risk of Preterm Birth

Compared with the referent group, odds of preterm birth were 1.3 (95% CI 1.0–1.7, \( P=0.023 \), 14.1%) for insomnia and 1.5 (95% CI 1.2–1.8, \( P=0.001 \), 15.5%) for sleep apnea.

Insomnia and sleep apnea were associated with significantly increased risk of preterm birth.

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“It’s frustrating that preterm birth is so poorly understood and that most risk factors from stress to insomnia (both of which are probably connected) are ignored by doctors. I had terrible insomnia during my pregnancy and my OB suggested taking Benadryl but was not concerned because as the article points out, “poor sleep is common during pregnancy.” I went into spontaneous preterm labor at about 28 weeks. My son passed away when he was one week old. I had what doctors told me was a healthy pregnancy, and my son was healthy except that he was born too soon.”

Rena, San Francisco, August 10, 2017

Comment on *New York Times* article “Sleep Problems in Pregnancy Tied to Premature Births”
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General tips for healthy sleep

• Associate bed with sleep
  • Only use the bed for sleeping (and sex). No TV, working, reading, or relaxing in bed. Just sleep.
  • If lying awake for more than 20 minutes, get out of bed and do something peaceful (in dim light). Get back in bed when sleepy.
• Sleep should only happen in bed (not on couch)
• Use “constructive worrying” technique
• Develop a wind down routine in the 60 minutes before bed to help the mind and body prepare for sleep
  • https://www.mindful.org/a-loving-kindness-mediation-for-moms/
Bedroom modifications to improve sleep

- Keep bedroom dark
  - Use black out shades or an eye mask
  - Place nightlights in the path to the bathroom and near infant care areas
- Keep bedroom quiet
  - Use earplugs or a white noise machine or app
  - Silence the phone and turn off vibrations - ideally, keep it in a different room.
- Keep bedroom cool (less than 75 degrees)
- Increase mother-infant proximity (e.g., baby sleeps in bassinet near bed, infant care supplies stored nearby)
- Shown to benefit postpartum women who are economically disadvantaged (Lee et al., 2011)
Tips for dealing with pregnancy-related physical symptoms that disrupt sleep

- Get regular exercise in late afternoon or early evening. Avoid exercise right before bedtime
- Avoid foods that may contribute to heartburn or reflux
- Sleep slightly upright to reduce heartburn
- Drink plenty of water during the day, but cut back before bedtime to reduce frequent trips to the bathroom
- Keep a few crackers by bed for hunger/queasiness
- Use supportive pillows to improve comfort and relieve pressure on aching muscles
- Yoga may help with pain and sleep (Beddoe et al., 2009; 2010)
Other potential targets for improving postpartum sleep

**A** Mothers

- General Infant Care: 18.5%
- Feeding: 49.0%
- Self Care: 7.0%
- Passive Awakening: 2.8%
- Partner Care: 0.7%
- Console: 5.1%
- Pacifier: 2.3%
- Checking-General: 1.7%
- Feeding Assist: 1.0%
- Changing: 12.0%

**B** Fathers

- General Infant Care: 4.2%
- Self Care: 18.4%
- Feeding: 9.4%
- Changing: 6.2%
- Feeding Assist: 4.4%
- Checking-General: 6.7%
- Console: 5.8%
- Pacifier: 0.9%
- Passive Awakening: 35.9%
- Partner Care: 1.9%
Effect of infant feeding type on parental sleep

<table>
<thead>
<tr>
<th></th>
<th>Exclusive breast milk</th>
<th>Supplementation</th>
<th>Statistical test</th>
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<tbody>
<tr>
<td><strong>Total sleep time (hours)</strong></td>
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<tr>
<td>Mothers</td>
<td></td>
<td></td>
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<tr>
<td>Evening (6 PM–12 AM)</td>
<td>7.2 ± 1.3 (n = 88)</td>
<td>6.4 ± 1.3 (n = 33)</td>
<td>t(119) = 2.92, P = .004</td>
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<tr>
<td>Night (12 AM–6 AM)</td>
<td>7.2 ± 1.3 (n = 86)</td>
<td>6.4 ± 1.4 (n = 23)</td>
<td>t(107) = 2.61, P = .010</td>
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<td>Fathers</td>
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<tr>
<td>Evening (6 PM–12 AM)</td>
<td>7.0 ± 1.2 (n = 85)</td>
<td>6.3 ± 1.4 (n = 33)</td>
<td>t(116) = 2.88, P = .005</td>
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<tr>
<td>Night (12 AM–6 AM)</td>
<td>7.0 ± 1.3 (n = 82)</td>
<td>6.3 ± 1.1 (n = 24)</td>
<td>t(104) = 2.13, P = .035</td>
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<td><strong>Perceived sleep disturbance (0–147 total possible score)</strong></td>
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<tr>
<td>Mothers</td>
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<tr>
<td>Evening (6 PM–12 AM)</td>
<td>41 ± 17 (n = 95)</td>
<td>41 ± 16 (n = 36)</td>
<td>t(117) = 1.82, P = .072</td>
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<tr>
<td>Night (12 AM–6 AM)</td>
<td>40 ± 17 (n = 92)</td>
<td>47 ± 16 (n = 27)</td>
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<tr>
<td>Fathers</td>
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<tr>
<td>Evening (6 PM–12 AM)</td>
<td>32 ± 13 (n = 93)</td>
<td>34 ± 10 (n = 33)</td>
<td>t(112) = 2.38, P = .019</td>
</tr>
<tr>
<td>Night (12 AM–6 AM)</td>
<td>32 ± 13 (n = 89)</td>
<td>38 ± 11 (n = 25)</td>
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</tbody>
</table>
Resources for improving infant sleep

- Babysleep.com
- Sleeping through the night: How infants, toddlers, and their parents can get a good night’s sleep, Jodi Mindell
Objectives for today

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2. Learn strategies for improving mild sleep problems
3. Become familiar with the symptoms, screening tools, and treatment options for more severe presentations (i.e., insomnia, sleep apnea, restless legs syndrome)
When do sleep problems necessitate further assessment and treatment?

- Severity is much worse than published norms
  - Pregnancy: Mindell, Cook, & Nikolovski, 2015, *Sleep Medicine*
- Causes significant distress
- Causes significant impairment
- Takes a long time to fall back asleep after awakenings
Insomnia criteria

- Dissatisfaction with sleep quality or quantity:
  - Difficulty initiating sleep
  - Difficulty maintaining sleep
  - Early-morning awakening
- Causes clinically significant distress or impairment
- Occurs at least 3 nights per week
- Present for at least 3 months
- Occurs despite adequate opportunity for sleep
Detection of insomnia

- Less than 1% of pregnant women had an insomnia diagnosis in their medical records (Felder et al., 2017)
- 12-60% of pregnant women report clinically significant insomnia symptoms of at least moderate severity
- Suggests insomnia may be under-detected during pregnancy
Assessment of insomnia

- Insomnia Severity Index (Morin, 1993)
  - 11-item self-report measure
  - Measures severity: absence, subthreshold, moderate, severe
- Insomnia Symptoms Questionnaire (Okun et al., 2009)
  - 13-item self-report measure
  - Validated in pregnant sample (Okun et al., 2015)
  - Insomnia present or absent
Pharmacologic treatment of insomnia

- Diphenhydramine and Trazodone may improve insomnia symptoms during pregnancy and prevent depressive symptoms during postpartum (Khazaie et al., 2013)

- Zolpidem associated with higher odds of preterm delivery, cesarean section, small for gestational age, and low birth weight infants (Wang et al., 2010)

- Mixed evidence for benzodiazepines
  - No increased risk for major congenital anomalies when taken in first trimester (Ban et al., 2014)
  - Risk for preterm birth may be greater for later exposures (Calderon-Margalit et al., 2009; Yonkers et al., 2017)
  - Adverse events among breastfeeding infants is low (Kelly et al., 2012)

- Requires case-by-case discussion of risks, benefits, alternatives
Pregnant women’s insomnia treatment preferences

- Cognitive behavior therapy: 51%
- Acupuncture: 37%
- Pharmacology: 12%
Cognitive behavior therapy for insomnia (CBT-I)

- Effective among non-pregnant populations, and recommended as first line of treatment approach (Trauer et al., 2015; Qaseem et al., 2016)

- There is a shortage of CBT-I clinicians, but it is also effective when delivered digitally
  - Sleepio (Espie et al., 2012)
  - SHUTi (Ritterband et al., 2016)
CBT-I during pregnancy

- Associated with significant improvement in objective and subjective sleep, depression, anxiety in an uncontrolled study (Tomfohr-Madsen et al., 2016)

- Research on Expecting moms and Sleep Therapy (REST) Study
  - Randomized controlled trial investigating whether digital CBT-I is effective among pregnant women (<28 weeks) with insomnia

rest.ucsf.edu

Are you pregnant and having trouble sleeping at night?

Our study might be able to help you. Visit rest.ucsf.edu for more information or call 415-476-7634.
Cognitive behavior therapy for insomnia (CBT-I)

- Tools to improve sleep by:
  - Consolidating sleep
  - Teaching the mind and body to associate the bed with sleep
  - Changing negative thoughts and myths about sleep
  - Using relaxation practices
  - Modifying habits and behaviors to promote better sleep
Sleep apnea

- **Criteria**
  - Snoring, gasping, breathing pauses
  - Daytime sleepiness

- **Screening measures**
  - STOP-BANG; Berlin Questionnaire; Epworth Sleepiness Scale
  - Might not be valid during pregnancy (at least during third trimester) \(^{(Lockhart et al., 2015)}\)

- **Diagnosis**
  - Sleep study (overnight polysomnography)
Sleep apnea

- Prevention
  - Among women who are overweight: Lose weight before pregnancy and control weight gain during pregnancy
  - Elevate head of bed to decrease snoring
  - Use nasal saline washes to relieve nasal congestion; avoid smoking

- Treatment
  - Continuous positive airway pressure
    - Safe and effective during pregnancy (Guilleminault et al., 2004)
Restless legs syndrome

- Criteria
  - Urge to move the legs, usually accompanied by unpleasant sensations
  - Worsens during periods of rest or inactivity
  - Relieved by movement
  - Worse in evening or night than during the day

- Screening/Diagnosis
  - “When you try to relax in the evening or sleep at night, do you ever have unpleasant, restless feelings in your legs that can be relieved by walking or movement?” (Ferri et al., 2007)
Restless legs syndrome

- **Treatment**
  - Iron, folate, vitamin B<sub>12</sub> (if deficient)
  - Cold and hot compresses, leg massage, acupressure, leg vibration, relaxation, walking/stretching before bed, elimination of caffeine (but not well-studied)
  - Pharmacological treatment (e.g., dopaminergics) may be considered for severe RLS, at lowest effective dose
Conclusions

- Poor sleep is normative during the perinatal period
- Sleep disorders also have increased prevalence
- Increased prevalence does not mean that poor sleep should be ignored or dismissed
- Poor sleep is associated with adverse physical and psychological health outcomes
- Important to prevent or intervene early
Referral options

- For UCSF patients:
  - Sleep Disorders Center: https://www.ucsfhealth.org/clinics/sleep_disorders_center/
  - Neuro/Psych Sleep Clinic: https://www.ucsfhealth.org/clinics/neuro_psych_sleep/
- The Stanford Center for Sleep Sciences and Medicine
  - http://sleep.stanford.edu/
- Sleep Health and Insomnia Program
  - http://med.stanford.edu/insomnia/clinicalservices.html
  - Director Rachel Manber has expertise in the perinatal period
- The Clinic: https://www.theclinicca.org/services/insomnia
- For pregnant women interested in participating in research:
  - rest.ucsf.edu
Many thanks for your time

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