

# Survey 1 - Patient Sleep Assessment

Subject #: \_\_\_\_\_

Time started: \_\_\_\_\_

## Patient Sleep Assessment

For children 2 years or older

To be completed before each approach by the research assistant.

Date patient approached: \_\_\_\_\_

Interviewer name: \_\_\_\_\_

Age of the patient (in years): \_\_\_\_\_

Patients primary diagnosis: \_\_\_\_\_ (as given by the nurse or resident)

Is the patient on continuous pulse oximetry monitoring? Please circle one. (as given by the nurse or resident)

Yes

No

**Hello [insert name]:**

Hello. My name is [insert name] and I would like to touch base with you concerning your child's ability to sleep last night while a patient at the University of Chicago Comer Children's Hospital.

You are being asked to take part in this study in order for us to learn more about sleep in hospitalized patients. If you agree to participate in this short interview, you will be asked questions about your child and about your child's sleep habits in the hospital as well as questions about your (the parent or guardian of the hospitalized patient) levels of sleepiness, fatigue, and mood. This study will take about 15 minutes to complete. The information in this survey will be used anonymously for research purposes and will not be shared with anyone.

If you wish, you may decide not to answer any of the questions. Also, we understand that you may not know the answers to some of these questions. For example, depending on your child, they may not be able to tell you how much they dreamed last night. If this is the case for any question, please leave that question blank.

**Basic Information<sup>1</sup>**

To be completed each morning by parent or guardian.

What is your age?: \_\_\_\_\_

For the following questions, please circle the answer that best describes you and your child.

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Is your child a...	Girl	Boy		
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What is the birth order of your child?	Oldest	Middle	Youngest	
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A multiple (e.g., a twin or triplet)		Only		
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Are you the child's....	Father	Mother	Grandparent	Other, please specify: _____
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Which category describes your current occupational status?	Employed full-time	Employed part-time	On maternity leave	
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Homemaker/at-home parent		Student	Unemployed/in-between jobs	
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What is the highest level of schooling you have completed?	Less than high school degree	High school degree	Some college	
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College degree		Postgraduate degree	Prefer not to answer	
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What is your race/ethnicity?	White/Caucasian	African-American	Asian	Hispanic
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Native American		Other: _____	Prefer not to answer	
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Please rate how well your child usually sleeps at night	Very well	Well	Fairly Well	
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Fairly Poorly		Poorly	Very Poorly	
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Do you consider your child's sleep as a problem	A very serious problem	A small problem	Not a problem at all	
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<sup>1</sup> Modified from Sadeh, Avi, Jodi A. Mindell, Kathryn Luedtke, and Benjamin Wiegand. Sleep and Sleep Ecology in the First 3 years: A Web-based Study. Journal of Sleep Research. 2009; 18 (1): 60-73.

**Karolinska Sleep Log<sup>2,3</sup>**To be completed each morning by parent or guardian.**The following questions refer to your child's sleep when they are AT HOME AND NOT ILL:**

1. At what time does your child wake up in the morning? \_\_\_\_\_ PM or AM (weekdays)  
\_\_\_\_\_ PM or AM (weekends)
2. How long does your child normally sleep at night? \_\_\_\_\_ hours & \_\_\_\_\_ minutes
3. How long does it normally take for your child to fall asleep? \_\_\_\_\_ hours &/or \_\_\_\_\_ minutes
4. How many awakenings does your child have in a normal night? \_\_\_\_\_
5. How many total minutes is your child awake after falling asleep at night? (*Don't include time in bed before falling asleep*) \_\_\_\_\_ minutes
6. Do you have a bedtime routine for your child? Yes / No
7. In a typical 7 day week, how often does your child adhere to his/her bedtime routine? \_\_\_\_\_ nights per week
8. What time do you usually start your child's bedtime routine? \_\_\_\_\_ PM or AM
9. What time do you usually put your child to bed at night? (*time of turning out the light*) \_\_\_\_\_ PM or AM (weekdays)  
\_\_\_\_\_ PM or AM (weekends)
10. On a typical night, what is the longest stretch of time that your child is asleep during the night without waking up? \_\_\_\_\_ hours & \_\_\_\_\_ minutes
11. How much total time does your child spend sleeping during the NIGHT (between 7 in the evening and 8 in the morning) \_\_\_\_\_ hours & \_\_\_\_\_ minutes
12. How many naps does your child take during a typical DAY (between 8 in the morning and 7 in the evening): \_\_\_\_\_ naps
13. If your child naps, what is your child's normal daily nap time? (e.g. from 1-3 pm everyday) \_\_\_\_\_ AM/PM to \_\_\_\_\_ AM/PM
14. How much total time does your child spend sleeping during the DAY (between 8 in the morning and 7 in the evening) \_\_\_\_\_ hours & \_\_\_\_\_ minutes

**The following questions refer to your child's sleep LAST NIGHT:**

15. At what time did your child wake up this morning? \_\_\_\_\_ PM or AM
16. How long did your child sleep last night? \_\_\_\_\_ hours & \_\_\_\_\_ minutes
17. How long did it take for your child to fall asleep? \_\_\_\_\_ hours &/or \_\_\_\_\_ minutes

<sup>2</sup> Modified for pediatrics from Keklund G, Akerstedt T. Objective components of individual differences in subjective sleep quality. J Sleep Res. 1997;6(4):217-20.

<sup>3</sup> Some questions from Sadeh, Avi, Jodi A. Mindell, Kathryn Luedtke, and Benjamin Wiegand. Sleep and Sleep Ecology in the First 3 years: A Web-based Study. Journal of Sleep Research. 2009; 18 (1): 60-73.

18. How many awakenings did your child have last night? \_\_\_\_\_
19. How many total minutes was your child awake after falling asleep last night? (*Don't include time in bed before falling asleep*) \_\_\_\_\_minutes
20. Was your child able to take his/her normal nap during this hospitalization? Yes / No  
If yes, what time did that occur? \_\_\_\_\_ AM/PM to \_\_\_\_\_ AM/PM

**Circle one per question only:**

21. How did your child sleep?  
 1                          2                          3                          4                          5  
 Very Poorly    Very Well
22. Did your child seem refreshed after waking up this morning?  
 1                          2                          3                          4                          5  
 Not at all    Completely
23. Did your child sleep soundly?  
 1                          2                          3                          4                          5  
 Very Restless    Very soundly
24. When compared to how your child sleeps at home, did your child sleep throughout the time allotted for sleep?  
 1                          2                          3                          4                          5  
 Woke up much too Early    Slept thru the night
25. How easy was it for your child to wake up?  
 1                          2                          3                          4                          5  
 Very Easy    Very Difficult
26. How easy was it for your child to fall asleep?  
 1                          2                          3                          4                          5  
 Very Easy    Very Difficult
27. How much did your child dream last night (if applicable)?  
 1                          2                          3                          4                          5  
 None    Much
28. How much was your child's sleep disturbed by noise?  
 1                          2                          3                          4                          5  
 Not at all    Very much
29. How much was your child's sleep disturbed by stress?  
 1                          2                          3                          4                          5  
 Not at all    Very much

### Potential Hospital Sleep Disruptions and Noises Questionnaire<sup>4, 5</sup>

To be completed each morning by parent or guardian.

Please rate the extent to which each of the following disrupted your child's sleep last night. 1 is not disruptive at all, 2 is somewhat disruptive, 3 is moderately disruptive, 4 is quite a bit disruptive and 5 is extremely disruptive.

Vital signs	1	2	3	4	5
Continuous pulse ox (if applicable)	1	2	3	4	5
Medications	1	2	3	4	5
Drawing blood or other test	1	2	3	4	5
Pain	1	2	3	4	5
Feeling anxious	1	2	3	4	5
Noise (all sources)	1	2	3	4	5
Staff conversation	1	2	3	4	5
Alarms on equipment	1	2	3	4	5
Room temperature	1	2	3	4	5
Nurse/Physician interruption	1	2	3	4	5
Cleaning staff interruption	1	2	3	4	5
Respiratory Therapist interruption (if applicable)	1	2	3	4	5

Was there anything else that disrupted your child's sleep? Please describe.

<sup>4</sup> Modified based on focus group with pediatric nurses and residents at University of Chicago from Gabor JY, Cooper AB, Crombach SA, Lee B, Kadikar N, Bettger HE, Hanly PJ. Contribution of the intensive care unit environment to sleep disruption in mechanically ventilated patients and healthy subjects. *Am J Respir Crit Care Med.* 2003;167(5):708-15.

<sup>5</sup> Modified based on focus group with pediatric nurses and residents at University of Chicago from Topf, M, Personal and Environmental Predictors of Patient Disturbance Due to Hospital Noise. *Journal of Applied Psychology.* 1985; Vol. 70, No. 1: 22-8.

**Pediatric Sleep Questionnaire<sup>6</sup>**

To be completed each morning by parent or guardian.

	Yes	No	Don't Know
<b>While sleeping does your child...</b>			
Snore more than half the time?			
Always snore?			
Snore loudly?			
Have "heavy" or loud breathing?			
Have trouble breathing or struggle to breath?			
<b>Have you ever...</b>			
Seen your child stop breathing during the night?			
<b>Does your child...</b>			
Tend to breathe through the mouth during the day?			
Have a dry mouth on waking up in the morning?			
Occasionally wet the bed?			
Wake up feeling un-refreshed in the morning?			
Have a problem with sleepiness during the day?			
Has a teacher or other supervisor commented that your child appears sleepy during the day?			
Is it hard to wake your child up in the morning?			
Does your child wake up with headaches in the morning?			
Did you child stop growing at a normal rate at any time since birth?			
Is your child overweight?			
<b>This child often...</b>			
Does not seem to listen when spoken to directly			
Has difficulty organizing task			
Is easily distracted by extraneous stimuli			
Fidgets with hands or feet or squirms in seat			
Is "on the go" or often acts as if "driven by a motor"			
Interrupts or intrudes on others (e.g. butts into conversations or games)			

<sup>6</sup> Chervin, R. D., Hedger, K., Dillon, J. E., & Pituch, K. J. Pediatric sleep questionnaire (PSQ): Validity and reliability of scales for sleep-disordered breathing, snoring, sleepiness, and behavioral problems. *Sleep Medicine*. 2000; 1(1): 21-32.

The following questions refer to ***YOUR*** current mood and level of sleepiness or fatigue:

### Epworth Sleepiness Scale<sup>7</sup>:

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation:

- 0 = no chance of dozing
- 1 = slight chance of dozing
- 2 = moderate chance of dozing
- 3 = high chance of dozing

Situation	Chance Of Dozing
Sitting and reading	
Watching TV	
Sitting inactive in a public place (e.g a theater or a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in traffic	

<sup>7</sup> Johns, MW. A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. Sleep. 1991;(14):540-5.

### VISUAL ANALOG MOOD SCALES<sup>8</sup>

**How alert do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How sad do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How tense do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How much of an effort is it to do anything?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How happy do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How weary do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How calm do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**How sleepy do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very little										
very much										

**Overall, how do you feel?**

0	1	2	3	4	5	6	7	8	9	10
very bad										
very good										

<sup>8</sup> Monk TH. A Visual Analogue Scale technique to measure global vigor and affect. Psychiatry Res. 1989;27(1):89-99.



### Stanford Sleepiness Scale<sup>9</sup>

This is a quick way to assess how alert you are feeling. If it is during the day when you go about your business, ideally you would want a rating of a one.

Using the 7-point scale below pick what best represents how you are feeling and circle the corresponding number on the chart below

#### An Introspective Measure of Sleepiness The Stanford Sleepiness Scale (SSS)

Degree of Sleepiness	Scale Rating
Feeling active, vital, alert, or wide awake	1
Functioning at high levels, but not at peak; able to concentrate	2
Awake, but relaxed; responsive but not fully alert	3
Somewhat foggy, let down	4
Foggy; losing interest in remaining awake; slowed down	5
Sleepy, woozy, fighting sleep; prefer to lie down	6
No longer fighting sleep, sleep onset soon; having dream-like thoughts	7
Asleep	X

<sup>9</sup>Hoddes, E., Zarcone, V., Smythe, H., Phillips, R. and Dement, W. C. (1973), Quantification of Sleepiness: A New Approach. *Psychophysiology*, 10: 431-436. doi:10.1111/j.1469-8986.1973.tb00801.x

# Survey 2 - Staff Survey

<b>How disruptive do pediatric patients and their parents perceive the following factors to sleep in the hospital?<sup>1</sup></b>					
	Not disruptive at all	Somewhat disruptive	Moderately disruptive	Quite a bit disruptive	Extremely disruptive
Vital signs	1	2	3	4	5
Continuous pulse ox (if applicable)	1	2	3	4	5
Medications	1	2	3	4	5
Drawing blood or other test	1	2	3	4	5
Pain	1	2	3	4	5
Feeling anxious	1	2	3	4	5
Noise (all sources)	1	2	3	4	5
Staff conversation	1	2	3	4	5
Alarms on equipment	1	2	3	4	5
Room temperature	1	2	3	4	5
Nurse/Physician interruption	1	2	3	4	5
Cleaning staff interruption	1	2	3	4	5
Respiratory Therapist interruption (if applicable)	1	2	3	4	5

<sup>1</sup> Modified from Grossman MN, Anderson SL, Worku A, et al. Awakenings? Patient and hospital staff perceptions of nighttime disruptions and their effect on patient sleep. J Clin Sleep Med. 2017;13(2):301–306.

<b>How effective do you feel the following interventions would be at reducing noise in the hospital at night?<sup>2</sup></b>					
	Very effective	Effective	Ineffective	Not at all	Unsure
Education of staff in the hospital	1	2	3	4	5
Posting signs in the unit about noise reduction	1	2	3	4	5
Turning pagers/portable phones to vibrate	1	2	3	4	5
Turning down ringers on phones in room	1	2	3	4	5
Lowering voices of staff conversations	1	2	3	4	5
Closing patient doors when appropriate	1	2	3	4	5
Reducing use of continuous monitors and alarms when not clinically indicated	1	2	3	4	5

<sup>2</sup> Modified from Kaur H, Rohlik GM, Nemergut ME, Tripathi S. Comparison of staff and family perceptions of causes of noise pollution in the Pediatric Intensive Care Unit and suggested intervention strategies. Noise Health. 2016;18(81):78.

**Please rate your level of agreement with the following statements regarding a child's sleep**

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Getting adequate sleep is important for a child's health	1	2	3	4	5
Children get less sleep in the hospital than at home	1	2	3	4	5
Maximizing pediatric patients' sleep in the hospital is important in helping them recover	1	2	3	4	5
I know how to help pediatric patients sleep better in the hospital	1	2	3	4	5
I am doing what I can to help pediatric patients sleep in the hospital	1	2	3	4	5

**Please rate your level of agreement with the following statements regarding parental sleep**

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
A parent getting adequate sleep is important for his or her child's health	1	2	3	4	5
Parents get less sleep in the hospital than at home	1	2	3	4	5
Maximizing parent sleep in the hospital is important in helping children recover	1	2	3	4	5
I know how to help parents sleep better in the hospital	1	2	3	4	5
I am doing what I can to help parents sleep in the hospital	1	2	3	4	5

Please choose one:

**Hospitalist**

**Staff Nurse**

**Resident**

**Other:**

Choose one: Predominantly Night  
Predominantly Day  
Choose one: Comer 5  
Comer 6

Choose one: PGY-1 PGY-2  
PGY-3 PGY-4  
Are you med/peds? Yes No

\_\_\_\_\_

Have you ever been hospitalized?      Yes                      No

Are you a parent?                              Yes                      No

Has your child ever been hospitalized?    Yes                      No      Not applicable

**Do you have any comments or concerns on how to improve pediatric inpatient sleep or parental sleep?**

Table S1: Mean, Median, and Standard Deviation Potential Hospital Sleep Disruption and Noises Questionnaire (PHSDNQ) Responses for Caregivers, Physicians, and Nurses

**Caregiver Responses to PHSDNQ, n=162**

<b>Disruption Factor</b>	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>
Vitals	2.42	2	1.66
Nurse / Physician Interruption	2.33	1	1.62
Pulseox	2.18	1	1.66
Pain	1.81	1	1.44
Medications	1.77	1	1.40
Anxiety	1.51	1	1.11
Temperature	1.51	1	1.15
Tests	1.51	1	1.29
Alarms on equipment	1.50	1	1.17
Respiratory Therapist	1.46	1	1.21
Noise (all sources)	1.37	1	0.98

Table S1a.

**Physician Responses to PHSDNQ, n=81**

<b>Disruption Factor</b>	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>
Tests	4.38	5	0.83
Alarms on equipment	4.05	4	0.79
Pain	4.00	4	0.95
Vitals	3.68	4	0.80
Noise (all sources)	3.60	4	0.98
Nurse/Physician Interruption	3.41	3	0.92
Anxiety	3.40	3	1.00
Meds	3.28	3	0.96
Respiratory Therapist	2.91	3	0.91
Continuous pulseox	2.89	3	1.00
Temperature	2.40	2	0.96

Table S1b.

**Nurse Responses to PHSDNQ, n=77**

<b>Disruption Factor</b>	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>
Alarms on equipment	4.13	4	0.89
Tests	4.05	4	1.07
Noise (all sources)	3.79	4	1.00
Vitals	3.57	4	0.99
Pain	3.57	4	1.14
Anxiety	3.30	3	1.14
Nurse/Physician Interruption	3.22	3	1.01
Medications	3.19	3	1.18
Respiratory Therapist	2.87	3	1.01
Continuous pulseox	2.84	3	1.04
Temperature	2.48	2	0.99

Table S1c.