

Table SI. Pittsburgh Sleep Quality Index and Regensburg Insomnia Scale

|                             | Pittsburgh Sleep Quality Index (12, 13)                                                                                                                                                                                                                                                                               | Regensburg Insomnia Scale (14)                                                                                                                                                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number and content of items | A total of 24 items, but just 18 of these items:<br>Require a self-assessment.<br>Are considered for evaluation.<br>Can be categorized into 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime functioning | A total of 10 items, additionally, the time patients go to bed, as well as when they awaken, is asked:<br>5 items concentrate on qualitative and quantitative sleep complaints.<br>Psychological aspects are documented via 4 items.<br>The last item scrutinizes the intake of sedatives. |
| Requested period            | 4 weeks                                                                                                                                                                                                                                                                                                               | 4 weeks                                                                                                                                                                                                                                                                                    |
| Main emphasis               | Quality of sleep and possible sleep disturbances                                                                                                                                                                                                                                                                      | Psychological and quantitative aspects of sleep                                                                                                                                                                                                                                            |
| Evaluation                  | Each component is rated between 0 and 3. After completion, all values are summed into a range of 0–21.<br>The higher the sum, the more limited the sleeping behaviour is.<br>Patients with an index higher than 5 points are classified as poor sleepers.                                                             | A 5-point Likert scale (0–4) was chosen to measure these aspects.<br>The total was ascertained by summing up each value with a total range of 0–40.<br>Patients who achieve values higher than 12 points can thus be considered sleep impaired.                                            |

**Table SII. List of sleep items of the validated sleep questionnaires with assessment of their relevance to patients with chronic pruritus**

| Items                                                                            | PSQI <sup>b</sup> | RIS <sup>b</sup> | AIS <sup>c</sup> | MOS    | BIS    | ISI    | SQI    | GSES   | SSS | ESS |
|----------------------------------------------------------------------------------|-------------------|------------------|------------------|--------|--------|--------|--------|--------|-----|-----|
| <i>Quantitative aspects of sleep measurement</i>                                 |                   |                  |                  |        |        |        |        |        |     |     |
| 1. Time to go to bed <sup>a</sup>                                                | +                 | +                |                  |        |        |        |        |        |     |     |
| 2. Time to fall asleep <sup>a</sup>                                              | +(n=2)            | +                | +                | +(n=2) | +      | +      | +(n=2) |        |     |     |
| 3. Time to get up <sup>a</sup>                                                   | +                 | +                |                  |        |        |        |        |        |     |     |
| 4. Sleep duration <sup>a</sup>                                                   | +                 | +                | +                | +      |        |        |        |        |     |     |
| <i>Qualitative aspects of sleep measurement</i>                                  |                   |                  |                  |        |        |        |        |        |     |     |
| 5. Waking up in the middle of the night or too early in the morning <sup>a</sup> | +                 | +(n=2)           | +(n=2)           | +      | +(n=2) | +(n=2) | +(n=3) |        |     |     |
| 6. Sleep quality/sleepless nights <sup>a</sup>                                   | +                 | +                | +                |        | +      | +      |        | +      |     |     |
| 7. Daytime sleepiness <sup>a</sup>                                               | +(n=2)            |                  | +                | +(n=3) |        |        |        |        | +   | +   |
| 8. Life quality                                                                  |                   |                  | +                |        |        |        |        |        |     |     |
| 9. Impaired daytime                                                              |                   | +                | +                |        | +      | +(n=2) |        |        |     |     |
| 10. Thinking about sleep                                                         |                   | +                |                  |        |        |        |        | +(n=2) |     |     |
| 11. Hypnotic intake                                                              | +                 | +                |                  |        |        |        | +      |        |     |     |
| 12. Fear of insomnia                                                             |                   | +                |                  |        |        |        |        | +(n=2) |     |     |
| Number of relevant items to pruritus patients                                    | 7                 | 6                | 5                | 4      | 3      | 3      | 2      | 1      | 1   | 1   |

<sup>a</sup>Important item for the pruritus patients; <sup>b</sup>selected questionnaires; <sup>c</sup>also useful, but no validated German version available.

PSQI: Pittsburgh Sleep Quality Index; RIS: Regensburg Insomnia Scale; AIS: Athens Insomnia Scale; MOS Sleep: Medical Outcome Study Sleep Scale; SQI: Sleep Quality Index; BIS: Bergen Insomnia Scale; ISI: Insomnia Severity Index; GSES: Glasgow Sleep Effort Scale; SSS: Stanford Sleepiness Scale; ESS: Epworth Sleepiness Scale.

**Table SIII. List of patient-reported comorbidities (multiple responses possible) with negative influence on patients' sleep**

| Non-sleepers ( <i>n</i> = 67)     |                                   | Sleepers ( <i>n</i> = 21)          |                                    |
|-----------------------------------|-----------------------------------|------------------------------------|------------------------------------|
| Day 1                             | Day 28                            | Day 1                              | Day 28                             |
| Mental problems ( <i>n</i> = 10)  | Mental problems ( <i>n</i> = 10)  | Breathing problems ( <i>n</i> = 3) | Breathing problems ( <i>n</i> = 1) |
| Pain ( <i>n</i> = 8)              | Pain ( <i>n</i> = 7)              | Mental problems ( <i>n</i> = 3)    | Pain ( <i>n</i> = 1)               |
| Strangury ( <i>n</i> = 6)         | Strangury ( <i>n</i> = 4)         | Pain ( <i>n</i> = 3)               | Strangury ( <i>n</i> = 1)          |
| Sleep environment ( <i>n</i> = 4) | Sleep environment ( <i>n</i> = 3) | Strangury ( <i>n</i> = 1)          |                                    |
| Breathing problem ( <i>n</i> = 2) | Night sweats ( <i>n</i> = 2)      | Night sweats ( <i>n</i> = 1)       |                                    |
| Night sweats ( <i>n</i> = 1)      | Breathing problem ( <i>n</i> = 1) | Fever ( <i>n</i> = 1)              |                                    |
| Fatigue ( <i>n</i> = 1)           | Fatigue ( <i>n</i> = 1)           |                                    |                                    |
| Neuropathy ( <i>n</i> = 1)        | Neuropathy ( <i>n</i> = 1)        |                                    |                                    |
| Paraesthesia ( <i>n</i> = 1)      | Paraesthesia ( <i>n</i> = 1)      |                                    |                                    |
| Hypertension ( <i>n</i> = 1)      | Hypertension ( <i>n</i> = 1)      |                                    |                                    |
| Medicine ( <i>n</i> = 1)          | Medicine ( <i>n</i> = 1)          |                                    |                                    |
| Cold ( <i>n</i> = 1)              | Cardiac problems ( <i>n</i> = 1)  |                                    |                                    |

Sleepers: no sleep-related disturbances due to chronic pruritus after 4 weeks. Non-sleepers: sleep-related disturbances due to chronic pruritus after 4 weeks.

*n*: frequency of mentioning.

**Table SIV. Illustration of the results of the Regensburg Insomnia Scale ("time to go to bed", "time to get up")**

| Item              | Sleepers ( <i>n</i> = 21)               |                                          | Non-Sleepers ( <i>n</i> = 67)            |                                          | <i>p</i> <sup>*a,e</sup> | <i>p</i> <sup>*b,e</sup> | <i>p</i> <sup>*c,f</sup> | <i>p</i> <sup>*d,f</sup> |
|-------------------|-----------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                   | Day 1<br>Mean ± SD                      | Day 28<br>Mean ± SD                      | Day 1<br>Mean ± SD                       | Day 28<br>Mean ± SD                      |                          |                          |                          |                          |
| Time to go to bed | 22.45 h ± 39 min<br>( <i>n</i> = 18)    | 22.44 h ± 37 min<br>( <i>n</i> = 18)     | 22.42 h ± 16 min<br>( <i>n</i> = 63)     | 22.41 h ± 1 h 11 min<br>( <i>n</i> = 61) | 0.396                    | 0.736                    | 0.313                    | 0.435                    |
| Time to get up    | 06.43 h ± 1 h 8 min<br>( <i>n</i> = 18) | 06:41 h ± 1 h 10 min<br>( <i>n</i> = 18) | 06.54 h ± 1 h 17 min<br>( <i>n</i> = 63) | 06.57 h ± 1 h 17 min<br>( <i>n</i> = 60) | 0.835                    | 0.531                    | 1.0                      | 0.220                    |

Sleepers: no sleep-related disturbances due to chronic pruritus after 4 weeks; Non-sleepers: sleep-related disturbances due to chronic pruritus after 4 weeks. *p*<sup>\*a</sup>: Level of significance: comparison between sleepers and non-sleepers day 1; *p*<sup>\*b</sup>: Level of significance: comparison between sleepers and non-sleepers day 28; *p*<sup>\*c</sup>: Level of significance: comparison sleepers day 1/day 28; *p*<sup>\*d</sup>: Level of significance: comparison non-sleepers day 1/day 28. <sup>e</sup>Mann-Whitney *U* test. <sup>f</sup>Wilcoxon test.

**Table SV. Illustration of the results of the Pittsburgh Sleep Quality Index ("time to go to bed", "time to fall asleep", "time to get up", "sleep duration")**

| Item                | Sleepers ( <i>n</i> = 21)                   |                                             | Non-sleepers ( <i>n</i> = 67)               |                                             | <i>p</i> <sup>*a,e</sup> | <i>p</i> <sup>*b,e</sup> | <i>p</i> <sup>*c,f</sup> | <i>p</i> <sup>*d,f</sup> |
|---------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                     | Day 1<br>Mean ± SD                          | Day 28<br>Mean ± SD                         | Day 1<br>Mean ± SD                          | Day 28<br>Mean ± SD                         |                          |                          |                          |                          |
| Time to go to bed   | 22.48 h ± 38 min<br>( <i>n</i> = 21)        | 22.45 h ± 36 min<br>( <i>n</i> = 21)        | 22.46 h ± 1 h 17 min<br>( <i>n</i> = 67)    | 22.46 h ± 1 h 13 min<br>( <i>n</i> = 66)    | 0.452                    | 0.635                    | 0.672                    | 0.406                    |
| Time to fall asleep | 28 min ± 17 min<br>( <i>n</i> = 21)         | 25 min ± 20 min<br>( <i>n</i> = 21)         | 41 min ± 45 min<br>( <i>n</i> = 67)         | 38 min ± 36 min<br>( <i>n</i> = 67)         | 0.278                    | 0.052                    | <b>0.041</b>             | 0.862                    |
| Time to get up      | 06.46 h ± 1 h 13 min<br>( <i>n</i> = 21)    | 07.03 h ± 1 h 4 min<br>( <i>n</i> = 21)     | 07.05 h ± 1 h 25 min<br>( <i>n</i> = 67)    | 07.19 h ± 2 h 13 min<br>( <i>n</i> = 67)    | 0.575                    | 0.920                    | 0.063                    | 0.121                    |
| Sleep duration      | 6 h 34 min ± 1 h 17 min<br>( <i>n</i> = 21) | 6 h 34 min ± 1 h 17 min<br>( <i>n</i> = 21) | 5 h 39 min ± 1 h 17 min<br>( <i>n</i> = 67) | 5 h 39 min ± 1 h 17 min<br>( <i>n</i> = 67) | <b>0.011</b>             | <b>0.011</b>             | 1.0                      | 1.0                      |

Sleepers: no sleep-related disturbances due to chronic pruritus after 4 weeks; Non-sleepers: sleep-related disturbances due to chronic pruritus after 4 weeks. *p*<sup>\*a</sup>: Level of significance: comparison between sleepers and non-sleepers day 1; *p*<sup>\*b</sup>: Level of significance: comparison between sleepers and non-sleepers day 28; *p*<sup>\*c</sup>: Level of significance: comparison sleepers day 1/day 28; *p*<sup>\*d</sup>: Level of significance: comparison non-sleepers day 1/day 28. <sup>e</sup>Mann-Whitney *U* test. <sup>f</sup>Wilcoxon test.