**Supplemental Table 45. Results from Studies that have Compared PSG to other Methods to Evaluate Sleep in the ICU**

**PSG vs. Nursing Observation and/or Patient Perception**

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| **Author, Year** | **Study** **Design** | **N** | **Patient Characteristics** | **Comparison** | **Findings** | **Comments** |
| Aurell, 1985 [1] | Prospective observational | 6 | Post op – major/noncardiac surgery | PSG vs. nurse observation | Sleep time consistently overestimated compared to parallel PSG | Study included 536 hrs, 26 nights of data |
| Fontaine, 1989 [2] | Prospective observational | 20 | Multisystem trauma | PSG vs. nurse observation vs patient perception | Nurse observed WASO was similar to PSG.MSA underestimated by nurse observation compared to PSG |  |
| Edwards, 1993 [3] | Prospective observational | 21 | oriented to person, place, time; stable physiologic status | PSG vs. nurse observation | When nurse indicated awake they were correct 69.6%; when indicated asleep they were correct 87.9% | 15 nurses participated; 340 observations made |
| Beecroft, 2008 [4] | Prospective observational | 12 | Mechanically ventilated; patients were excluded if GCS ≤ 10, lorazepam eq dose ≥ 10µg/kg, or had received paralytic | PSG vs. nurse observation vs actigraphy | Nurse assessment underestimated # of awakenings compared to PSG; Despite similar values reported for TST and SE, correlational analysis indicated there was no significant relationship between nurse and psg assessements for TST, SE, or # of awakenings; Overall agreement between actigraphy and PSG was <65% |  |
| Elliot, 2013 [5] | Prospective observational | 57 enrolled, PSG data analyzed for 53 | Pts were all able to give informed consent on their own behalf (described as interactive and calm). Data analyzed for 53 pts. 26 pts on MV (PSV, PCV, SIMV), 12 pts were extubated during PSG monitoring. Study did include pts receiving benzos and opiates | PSG v.s patient perceptions as measured by RCSQ and Sleep in the ICU Questionaire | No direct comparison; but TST 5hrs, RCSQ for ICU 57.5 |  |

**PSG vs. actigraphy**

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| **Author, Year** | **Study** **Design** | **N** | **Patient Characteristics** | **Comparison** | **Findings** |
| Beecroft 2008 [4] | Prospective observational | 12 | Mechanically ventilated; patients were excluded if GCS ≤ 10, lorazepam eq dose ≥ 10µg/kg, or had received paralytic | PSG vs nurse observation vs actigraphy | Overall agreement between actigraphy and PSG was <65% |
| Van der Kooi, 2013 [6] | Prospective observational | 7 | 7 post cardiothoracic surgery pts (6 CAB, 1 valve repair); may have received sedatives, opioids, and even neuromuscular blockade | PSG vs. actigraphy | The # of awakenings was the only parameter that showed a statistically significant correlation (r=0.76, P=0.049)Median sensitivity to detect sleep was 94% (IQR 91-98%); median specificity 19% (IQR 8-24%)Actigraphy underestimated wake time and overestimated sleep compared to PSG |

**PSG vs. spectral analysis**

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| **Author, Year** | **Study** **Design** | **N** | **Patient Characteristics** | **Comparison** | **Findings** |
| Ambrogio, 2008 [7] | observational | 14 critically ill pts (24 hr psg) and 17 control pts (8 hr psg).  | Mechanically ventilated compared to age-matched ambulatory controls | PSG R&K scoring vs. spectral analysis | R&K reliability was poor (k= 0.19); if only divided into NREM, REM, wake (k=0.39)Sleep-wakefulness organization (k-0.51)Burst suppression – no pt experienced Spectral analysis – (K= 1.0)  |

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