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### Literature Search Terms

Actigraphy, actigraph(s), actimetry, actigraph, accelerometer, actigraphic, actigraphical, actigraphically, actigraphies, actigraphyic, actometer(s), sleep deprivation, intrinsic sleep disorders, nocturnal myoclonus syndrome, electromyography actigraphy, paradoxical insomnia, sleep state misperception(s), subjective insomnia, subjective sleepiness, pseudo-insomnia, insomnia without objective findings, sleep hypochondriasis, subjective sleep complaint, periodic limb movement disorder, periodic limb movements of sleep, PLMD, PLMS, periodic limb movement(s), periodic leg movement(s), sleep leg movement(s), periodic movements of sleep, PLM, leg jerks, leg motor activity, sleep myoclonus, nocturnal myoclonus, myoclonic hyperkinesias, sleep myoclonus syndrome(s), periodic movement disorder, sleep-related movement disorder(s), sleep-related movement disorder(s), electromyograph, electromyogram, EMG, electromyography, insufficient sleep syndrome, behaviorally induced insufficient sleep syndrome, insufficient nocturnal sleep, insufficient sleep disorder, sleep curtailment, sleep reduction, sleep restriction, sleep deprivation, sleep log(s), sleep diary, sleep diaries, sleep journal(s), caregiver report(s), caregiver report of sleep, accuracy, validity, diagnostic accuracy, diagnostic test accuracy study, validation study, instrument validation, accurate, accurately, accurateness, valid, validly, validate(s), validated, and validating.

### Summary of Study Sample Characteristics

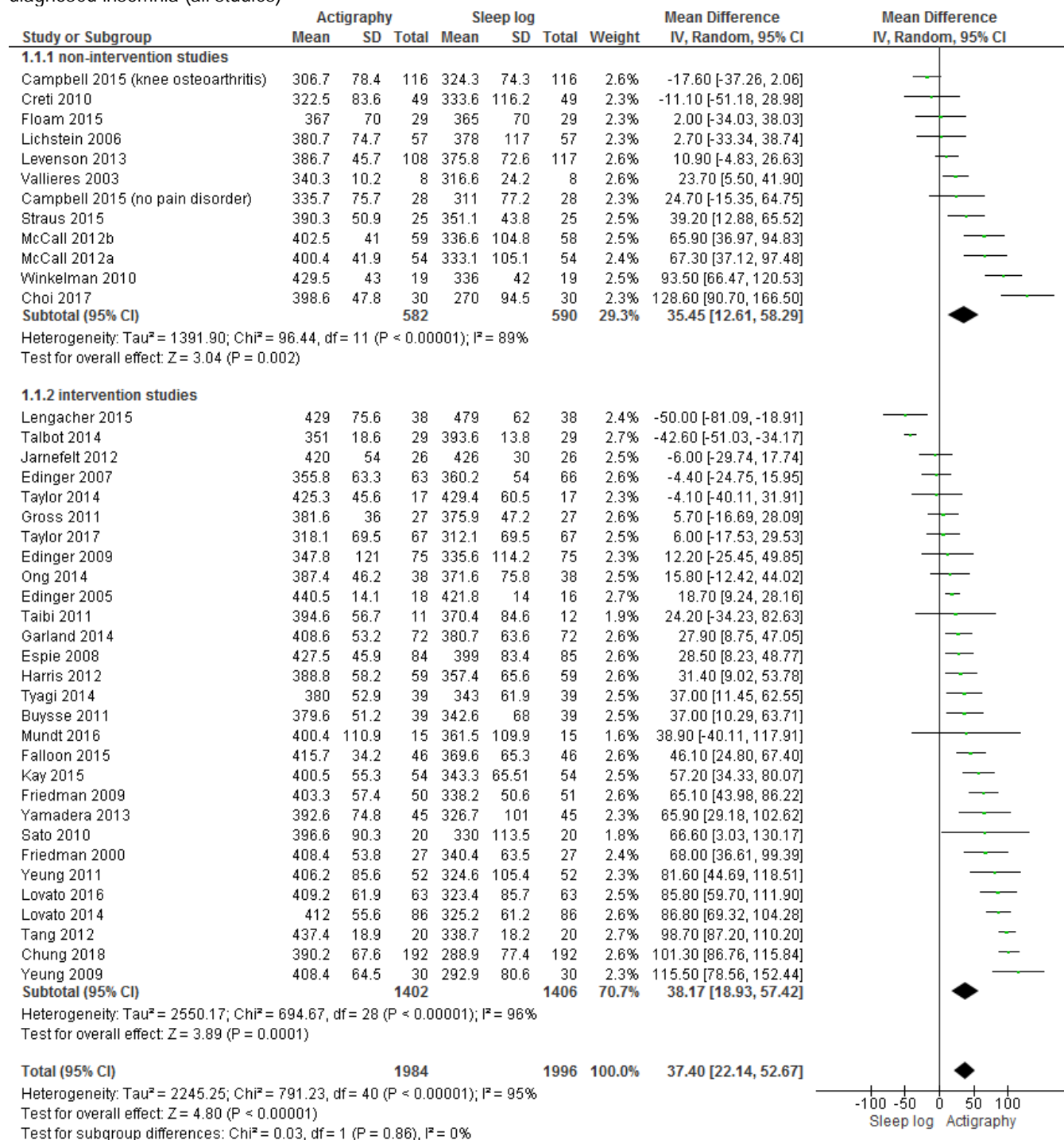
Study	Sleep Disorder(s)	Comorbidities	Gender M:F	Age M (SD)	Intervention
<b>Clinical Question 1 – Insomnia</b>					
Alessi 2016	Insomnia	Multiple, non-specific	154:5	72 (8)	CBT
Buyse 2011	Insomnia	Common for older adults	25:54	72 (7)	Brief behavioral treatment for insomnia

Campbell 2015	Insomnia	Knee osteoarthritis	58:150	60 (9)	CBT
Choi 2017	Insomnia	None	6:24	58 (10)	NA
Chung 2015	Insomnia	Major depressive disorder	31:119	49 (10)	Acupuncture
Chung 2018	Insomnia	Major depressive disorder	55:169	53 (10)	Acupuncture
Creti 2010	Insomnia	Chronic fatigue syndrome	8:41	43 (12)	NA
Edinger 2005	Insomnia	Fibromyalgia	2:45	49 (8)	CBT
Edinger 2007	Insomnia	None	43:43	55 (10)	CBT
Edinger 2009	Insomnia	Mixed psychiatric disorders	70:11	54 (14)	CBT
Epstein 2012	Insomnia	None	64:115	69 (8)	SRT, SCT, multicomponent behavioral
Espie 2007	Insomnia	None	64:137	54 (15)	CBT
Espie 2008	Insomnia	Cancer	47:103	60 (12)	CBT
Falloon 2015	Insomnia	None	22:75	54 (13)	Sleep restriction
Floam 2015	Insomnia	None	16:32	25 (1.5)	NA
Friedman 2000	Insomnia	Common for older adults	39:55	64 (7)	Sleep restriction + sleep hygiene
Friedman 2009	Insomnia	Common for older adults	15:36	64 (7)	Bright light
Garland 2014	Insomnia	Cancer	20:52	59 (11)	Mindfulness-based stress reduction
Gross 2011	Insomnia	None	8:22	49 (10)	Mindfulness-based stress reduction
Harris 2012	Insomnia	None	23:56	41 (14)	Intensive sleep retraining
Jarnefelt 2012	Insomnia	None	13:13	44 (8)	CBT
Kang 2017	Insomnia	None	7:12	45 (10)	CBT
Kay 2015	Insomnia	None	49:65	68 (6)	NA
Lengacher 2015	Insomnia	Breast cancer	0:79	57 (10)	Mindfulness-based stress reduction
Levenson 2013	Insomnia	Common for older adults	78:160	72 (7)	NA
Lichstein 2006	Insomnia	None	26:31	21 to 87	NA
Lovato 2014	Insomnia	Common for older adults	55:63	64 (6)	CBT
Lovato 2016	Insomnia	None	43:48	63 (6)	CBT
McCall 2012 (JCSM)	Insomnia	Depression	20:40	42 (12)	NA
McCall 2012 (JSR)	Insomnia	Depression	18:36	41 (13)	NA
Mundt 2016	Insomnia	Fibromyalgia	3:110	53 (11)	
Ong 2014	Insomnia	None	14:40	43 (12)	Mindful meditation
Sato 2010	Insomnia	None	6:14	57 (13)	CBT
Schechter 2018	Insomnia	None	6:8	47 (12)	Light therapy
Straus 2015	Insomnia	PTSD	74:23	33 (8)	NA
Taibi 2011	Insomnia	Osteoarthritis	0:14	65 (7)	Yoga
Talbot 2014	Insomnia	PTSD	14:31	37 (9)	CBT
Tang 2012	Insomnia	Chronic pain	2:18	48 (9)	Hybrid CBT
Taylor 2014	Insomnia	None	14:20	20 (2)	CBT
Taylor 2017	Insomnia	Various including anxiety, depression, PTSD, alcohol use disorder, head injury, other	83:17	33 (8)	CBT
Tyagi 2014	Insomnia	Various including diabetes, CVD, hypertension, arthritis, and genitourinary disorder	29:50	72 (7)	Brief behavioral treatment
Vallieres 2003	Insomnia				
Winkelman 2010	Insomnia	None	19:16	39 (9)	NA
Yamadera 2013	Insomnia	None	20:25	60 (12)	CBT
Yeung 2009	Insomnia	None	14:46	48 (9)	Acupuncture
Yeung 2011	Insomnia	None	16:62	48 (9)	Acupuncture

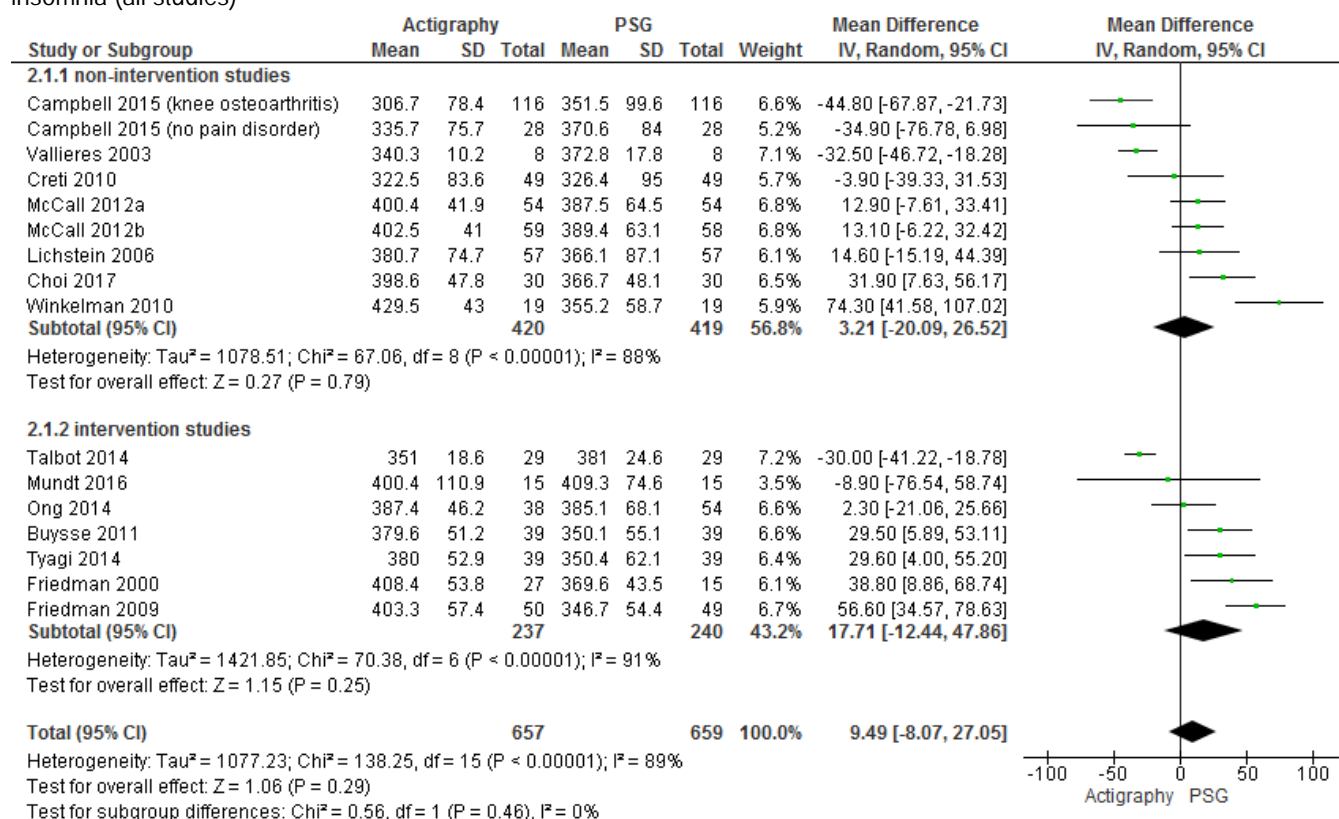
Clinical Question 2 – Circadian rhythm sleep-wake disorders					
de Rui 2014	CRSWD	Decompensated cirrhosis	9:3	59 (15)	Light therapy
Pickering 2014	CRSWD	Craniopharyngioma	15:15	51 (12)	NA
Clinical Question 3 – Sleep-related breathing disorders					
Choi 2017	Sleep-disordered breathing	None	6:24	58 (10)	NA
Elbaz 2002	OSA	None	15:5	52 (15)	NA
Garcia-Diaz 2007	Sleep apnea/hypopnea syndrome	None	54:8	54 (10)	NA
Kim 2013	OSA	None	84:17	49 (11)	NA
Pallin 2014	OSA	None	84:19	55 (14)	NA
Sharif 2013	OSA	None	83:24	45 (14)	NA
Clinical Question 4 – Hypersomnia					
Bradshaw 2007	Hypersomnia	None	47:7	31 (10)	NA
Clinical Question 5 – Periodic limb movement disorder					
Gschliesser 2009	PLMD	None	18:6	58 (12)	NA
Kobayashi 2014	RLS, PLMD	None	14:27	52 (16)	NA
Montgomery-Downs 2005	PLMD	None	42:57	8 (2)	NA
Rogers 2012	PLMD	Sickle cell disease	10:10	10 (4)	NA
Sforza 2005	RLS	None	7:4	57 (13)	NA
Clinical Question 6 – Insufficient sleep syndrome					
Barger 2014	Insufficient sleep	None	54:10	46 (4.5)	Hypnotic drug
Bjorvatn 2007	Insufficient sleep	None	16:1	42 (13)	Bright light and melatonin
Fietz 2009	Insufficient sleep	None	9:15	27 (5)	NA
Forberg 2010	Insufficient sleep	None	25:0	44 (9)	NA
Gohar 2009	Insufficient sleep	None	12:27	28 (4)	NA
Kim 2011	Insufficient sleep	None	10:48	27 (2)	NA
Rose 2008	Insufficient sleep	None	16:15	29	Change in work schedule
Rosekind 2006	Insufficient sleep	None	29:0	41	Alertness management program
Signal 2005	Insufficient sleep	None	21:0	42 (9)	NA
Simons 2011	Insufficient sleep	None	21:3	37 (8)	NA
Thorne 2008	Insufficient sleep	None	7:0	41 (12)	NA
Clinical Question 7 – Pediatric sleep disorders					
Appleton 2012	Non-specific	Neurodevelopmental disorders	97:49	9 (3)	Melatonin
Conroy 2017	Insomnia	Depression	3:8	17 (2)	Modified CBT-I
de Bruin 2015	Insomnia	None	3:10	15 (2)	CBT-I
Dayyat 2011	Insomnia	None	169:158	6 (1)	NA
Gringras 2014	Non-specific	Neurodevelopmental disorder	54:67	9 (3)	Weighted blankets
Paine 2011	Insomnia	None	24:18	9 (2)	CBT-I
Palmero 2017	Insomnia	Physical and psychiatric	10:30	15 (2)	Brief CBT-I
Saxvig 2014	DSPWD	None	12:28	21 (3)	Bright light and melatonin
Van Maanen 2017	DSPWD	Neurodevelopmental disorders	51:33	9	Melatonin
Wasdell 2008	DSPWD	Neurodevelopmental disorders	31:19	7 (4)	Melatonin

## Insomnia in Adult Populations

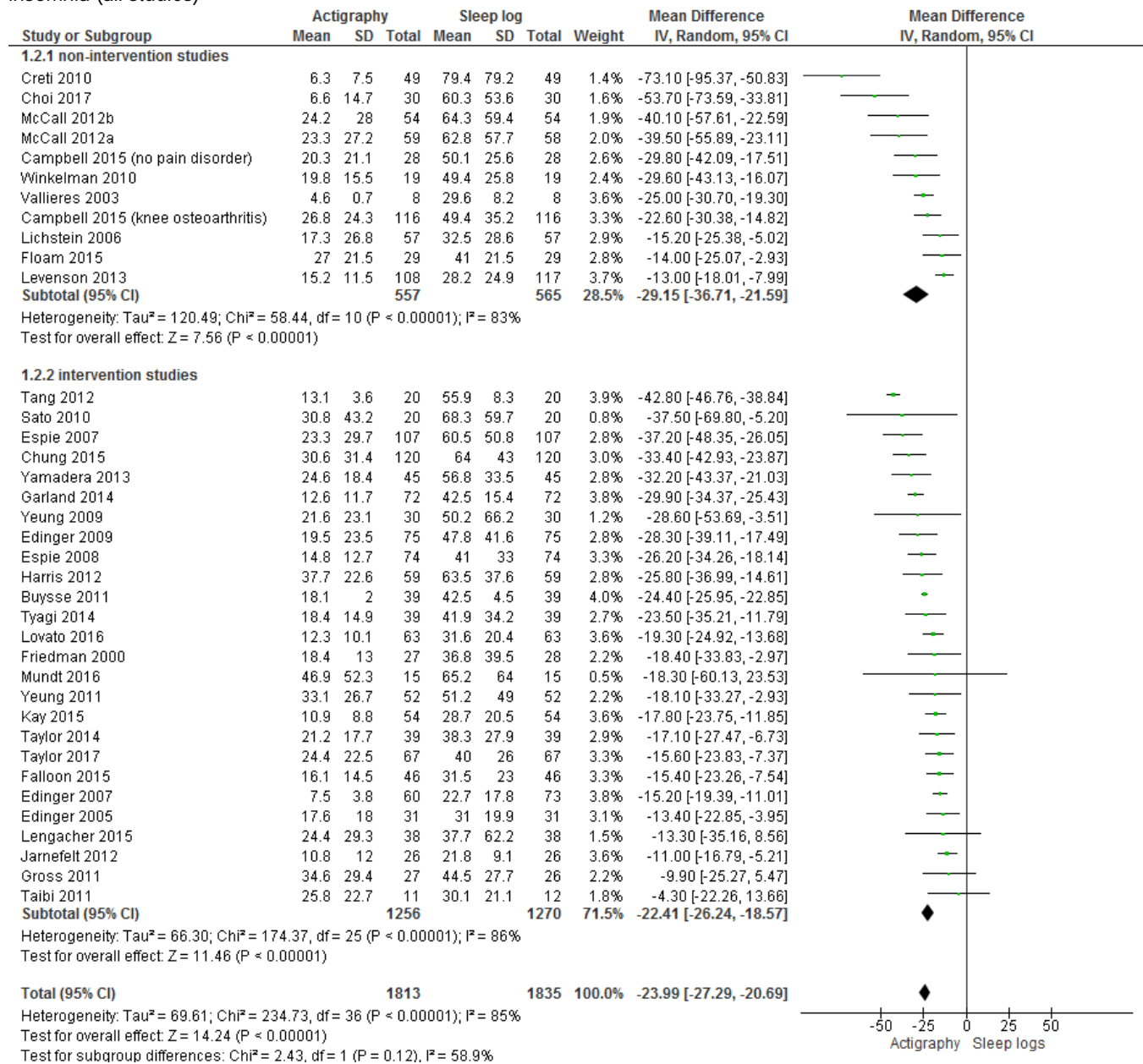
Figure S1a - Comparison of actigraphy to sleep logs for baseline total sleep time (min) in patients with suspected or diagnosed insomnia (all studies)



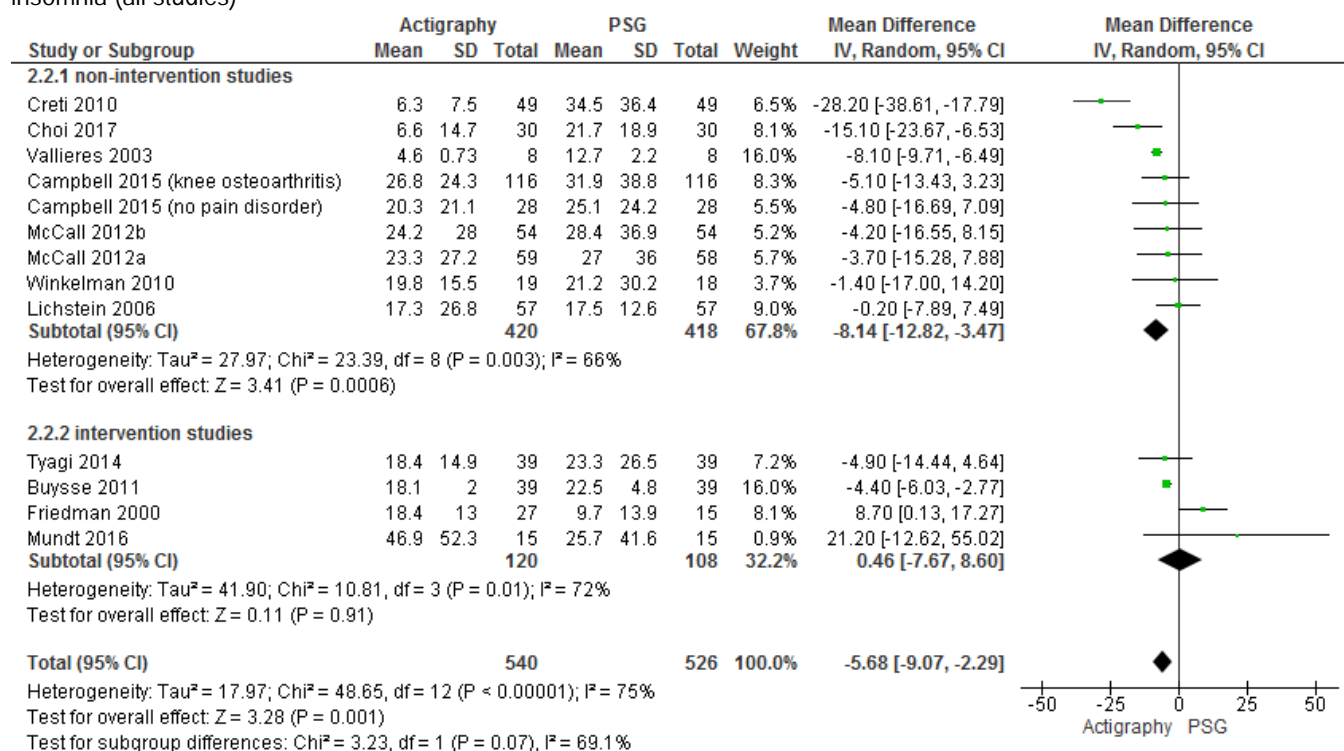
**Figure S1b** - Comparison of actigraphy to PSG for baseline total sleep time (min) in patients with suspected or diagnosed insomnia (all studies)



**Figure S2a - Comparison of actigraphy to sleep logs for baseline sleep latency (min) in patients with suspected or diagnosed insomnia (all studies)**

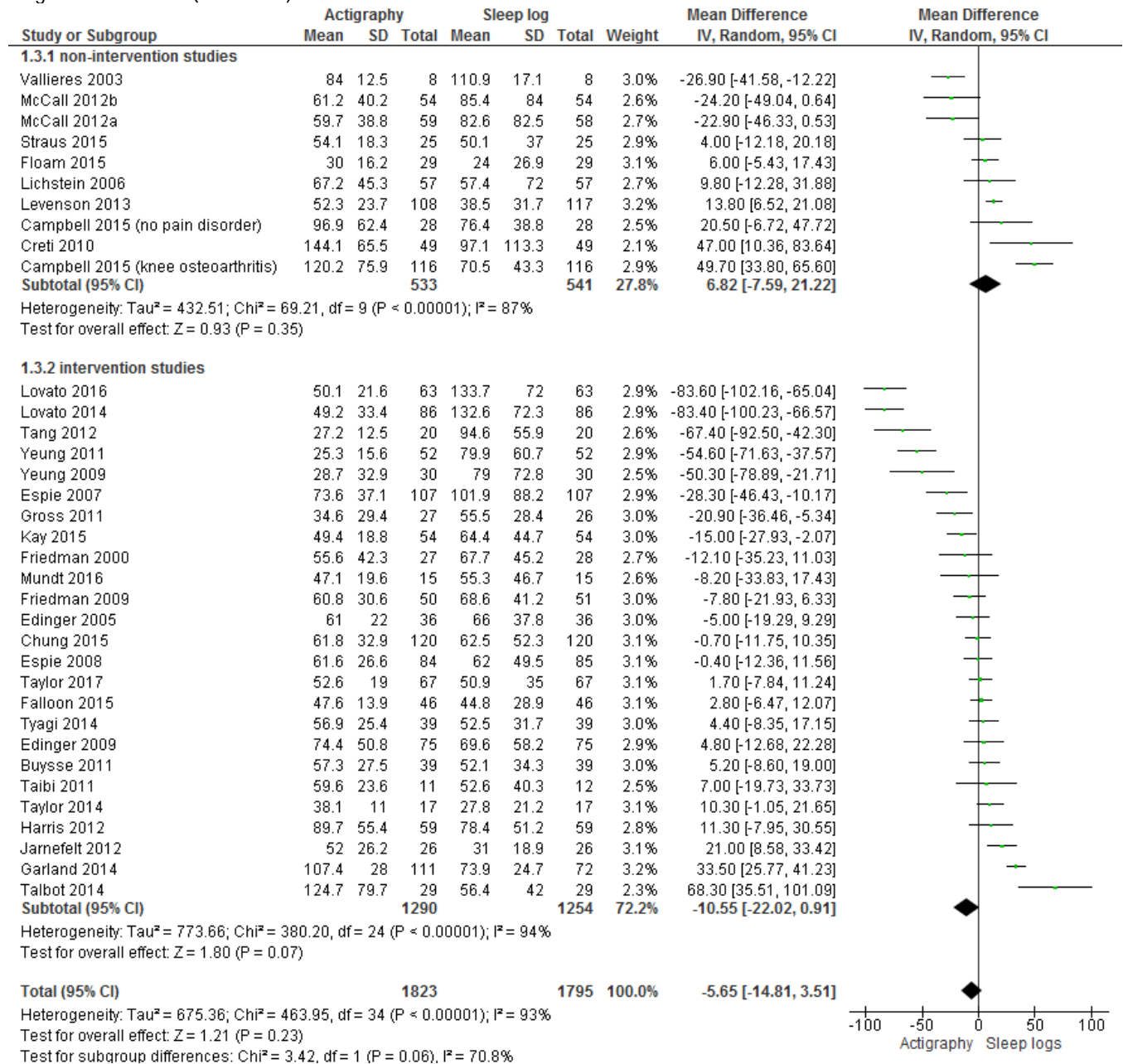


**Figure S2b** - Comparison of actigraphy to PSG for baseline sleep onset latency (min) in patients with suspected or diagnosed insomnia (all studies)

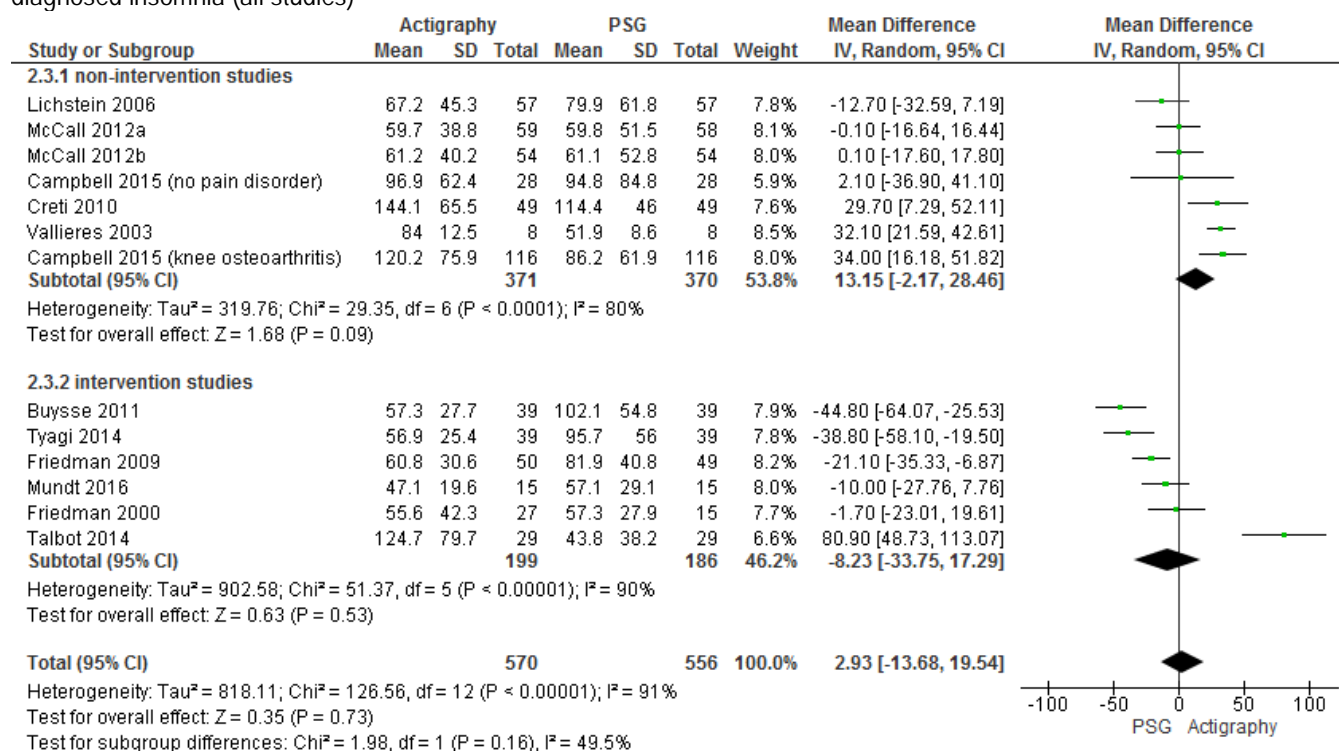




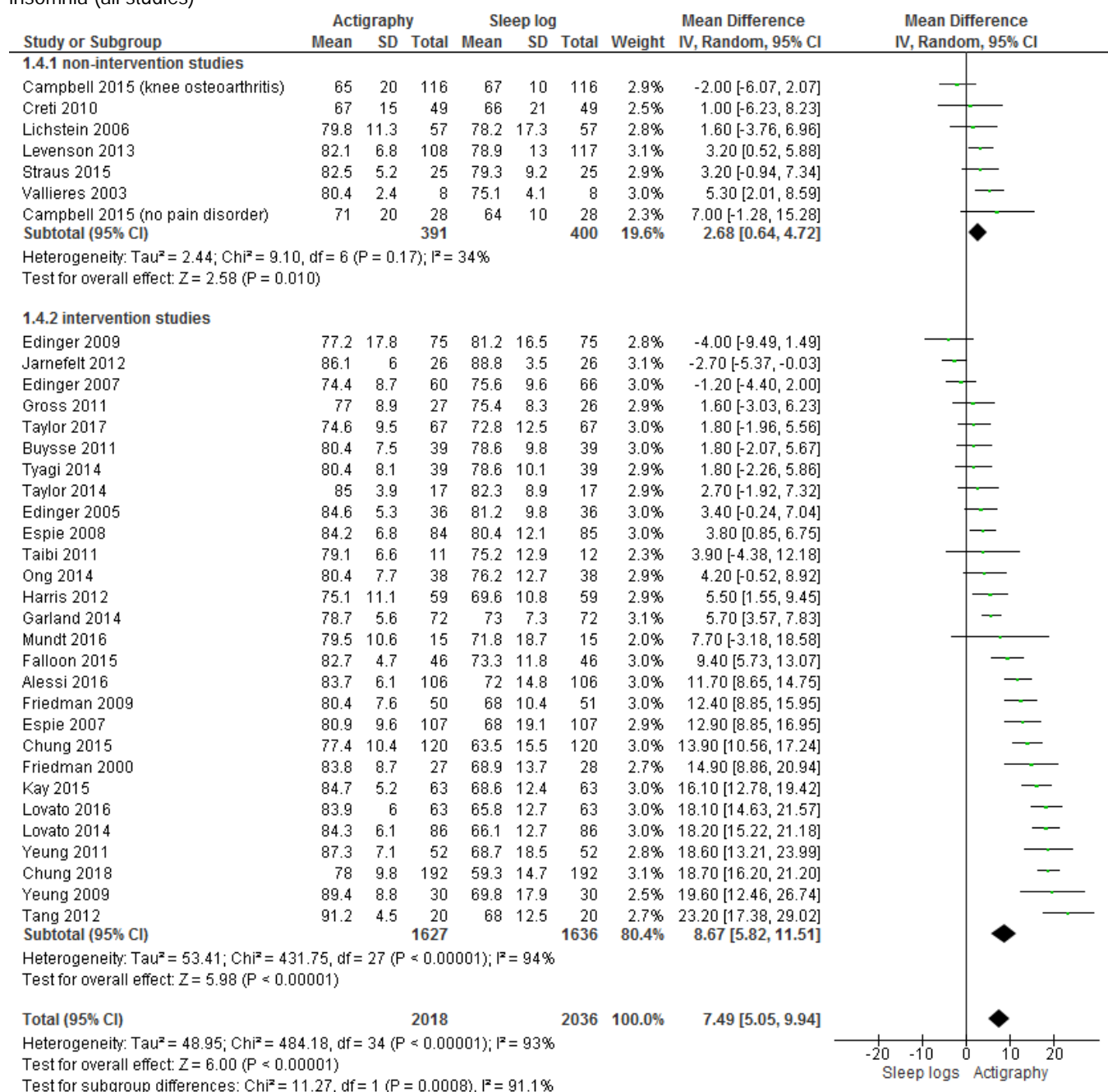
**Figure S3a** - Comparison of actigraphy to sleep logs for baseline wake after sleep onset (min) in patients with suspected or diagnosed insomnia (all studies)



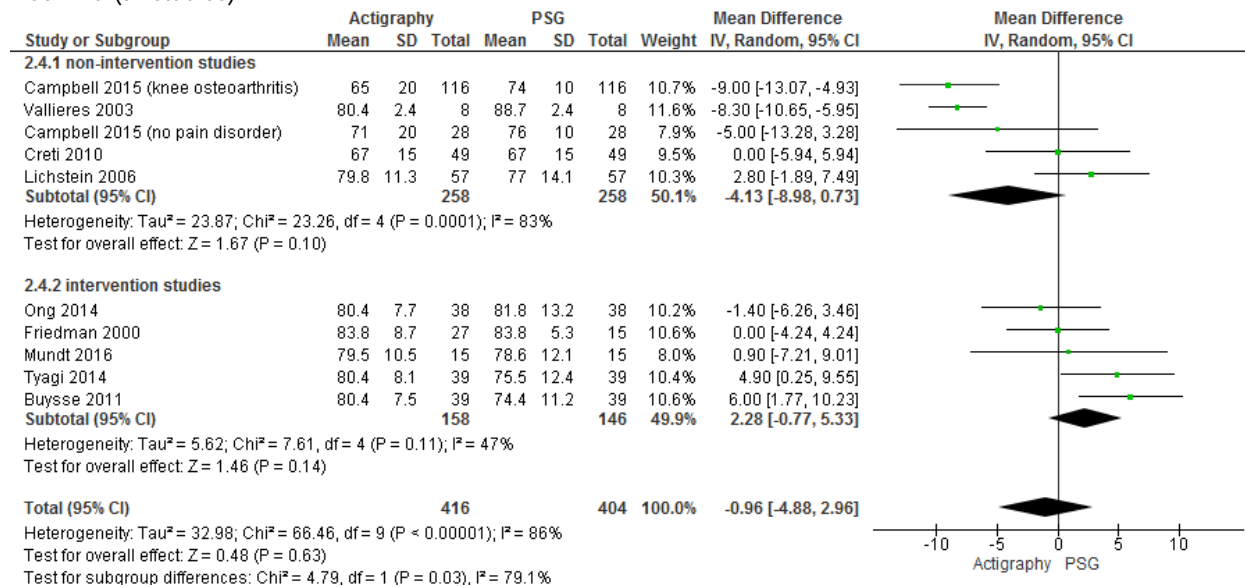
**Figure S3b** - Comparison of actigraphy to PSG for baseline wake after sleep onset (min) in patients with suspected or diagnosed insomnia (all studies)



**Figure S4a** - Comparison of actigraphy to sleep logs for baseline sleep efficiency (%) in patients with suspected or diagnosed insomnia (all studies)



**Figure S4b** - Comparison of actigraphy to PSG for baseline sleep efficiency (%) in patients with suspected or diagnosed insomnia (all studies)



**Table S1a** – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of sleep parameters in patients with suspected or diagnosed insomnia

References: Alessi 2016 (A); Buyse 2011 (B); Campbell 2015 (C); Choi 2017 (D); Chung 2015 (E); Chung 2018 (F); Creti 2010 (G); Edinger 2007 (H); Edinger 2005 (I); Edinger 2009 (J); Espie 2007 (K); Espie 2008 (L); Falloon 2015 (M); Floam 2015 (N); Friedman 2009 (O); Friedman 2000 (P); Garland 2014 (Q); Gross 2011 (R); Harris 2012 (S); Jarnefelt 2012 (T); Kay 2015 (U); Lengacher 2014 (V); Levenson 2013 (W); Lichstein 2006 (X); Lovato 2014 (Y); Lovato 2016 (Z); McCall 2012a (AA); McCall 2012b (BB); Mundt 2016 (CC); Ong 2014 (DD); Sato 2010 (EE); Straus 2015 (FF); Taibi 2011 (GG); Talbot 2014 (HH); Tang 2012 (II); Taylor 2014 (JJ); Taylor 2017 (KK); Tyagi 2014 (LL); Vallieres 2003 (MM); Winkelman 2010 (NN); Yamadera 2013 (OO); Yeung 2011 (PP); Yeung 2009 (QQ)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S1a)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy was <b>37.40 minutes higher</b> <sup>1</sup> (22.14 higher to 52.67 higher) as compared to sleep logs	1996 (40 studies) <sup>B,D,F,J,L-QQ</sup>
SOL* (see Figure S2a)	⊕⊕⊕⊕ HIGH	The mean difference in SOL measured by actigraphy was <b>23.99 minutes lower</b> <sup>1</sup> (27.29 lower to 20.69 lower) as compared to sleep logs	1835 (36 studies) <sup>B,E,G-N,P,X,Z-CC,EE,GG,II-QQ</sup>
WASO* (see Figure S3a)	⊕⊕⊕⊕ HIGH	The mean difference in WASO measured by actigraphy was <b>5.65 minutes lower</b> <sup>2</sup> (14.81 lower to 3.51 higher) as compared to sleep logs	1795 (34 studies) <sup>B,C,E,G,I-U,W-CC,FF-MM,PP,QQ</sup>
SE* (see Figure S4a)	⊕⊕⊕⊕ HIGH	The mean difference in SE measured by actigraphy was <b>7.49 % higher</b> <sup>1</sup> (5.05 higher to 9.94 higher) as compared to sleep logs	2036 (34 studies) <sup>A-C,E-M,O-U,W-Z,CC,DD,FF,GG,II-MM,PP,QQ</sup>

\* Critical Outcome

<sup>a</sup> 95% CI crosses clinical significance threshold

<sup>1</sup> Meets clinical significance threshold

<sup>2</sup> Does not meet clinical significance threshold

**Table S1b** – Summary of Findings table for actigraphy compared to PSG (all studies) for the assessment of sleep parameters in patients with suspected or diagnosed insomnia

References: Buysse 2011 (A); Campbell 2015 (B); Choi 2017 (C); Creti 2010 (D); Friedman 2000 (E); Friedman 2009 (F); Lichstein 2006 (G); McCall 2012a (H); McCall 2012b (I); Mundt 2016 (J); Ong 2014 (K); Talbot 2014 (L); Tyagi 2014 (M); Vallieres 2003 (N); Winkelman 2010 (O)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs PSG	No of Participants (studies)
TST* (see Figure S1b)	⊕⊕⊕⊕ HIGH	The width of the 95% CI of the mean difference in TST measured by actigraphy as compared to PSG was <b>35.12 minutes</b> <sup>1</sup>	659 (15 studies) <sup>A-O</sup>
SOL* (see Figure S2b)	⊕⊕⊕⊕ HIGH	The width of the 95% CI of the mean difference in SOL measured by actigraphy as compared to PSG was <b>6.78 minutes</b> <sup>1</sup>	540 (12 studies) <sup>A-E,G-J,M-O</sup>
WASO* (see Figure S3b)	⊕⊕⊕○ MODERATE <sup>a</sup>	The width of the 95% CI of the mean difference in WASO measured by actigraphy as compared to PSG was <b>33.22 minutes</b> <sup>2</sup>	624 (12 studies) <sup>A,B,D-J,L-N</sup>
SE* (see Figure S4b)	⊕⊕⊕○ MODERATE <sup>a</sup>	The width of the 95% CI of the mean difference in SE measured by actigraphy as compared to PSG was <b>7.84 %</b> <sup>2</sup>	416 (9 studies) <sup>A,B,D,E,G,J,K,M,N</sup>

\* Critical Outcome

<sup>a</sup> 95% CI of subgroups exceeds limits

<sup>1</sup> Within clinical significance limits

<sup>2</sup> Exceeds clinical significance limits

Figure S5a - Comparison of actigraphy to sleep logs for post-treatment total sleep time (min) in patients with suspected or diagnosed insomnia (intervention studies only)

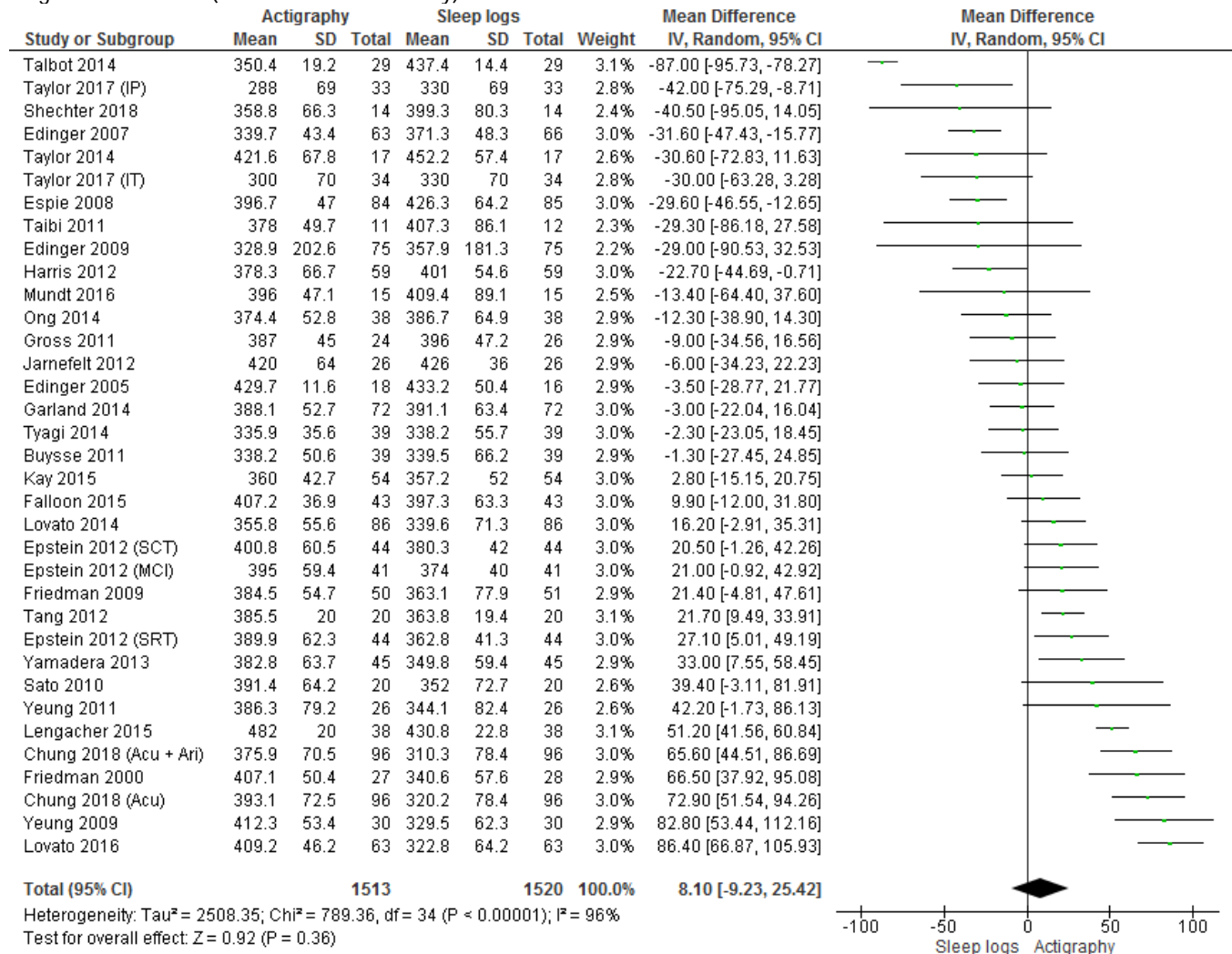
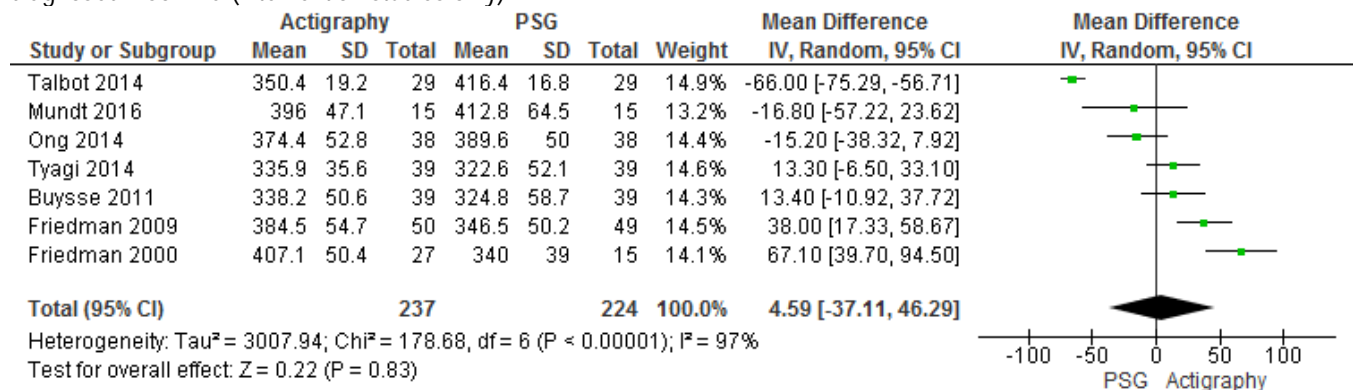
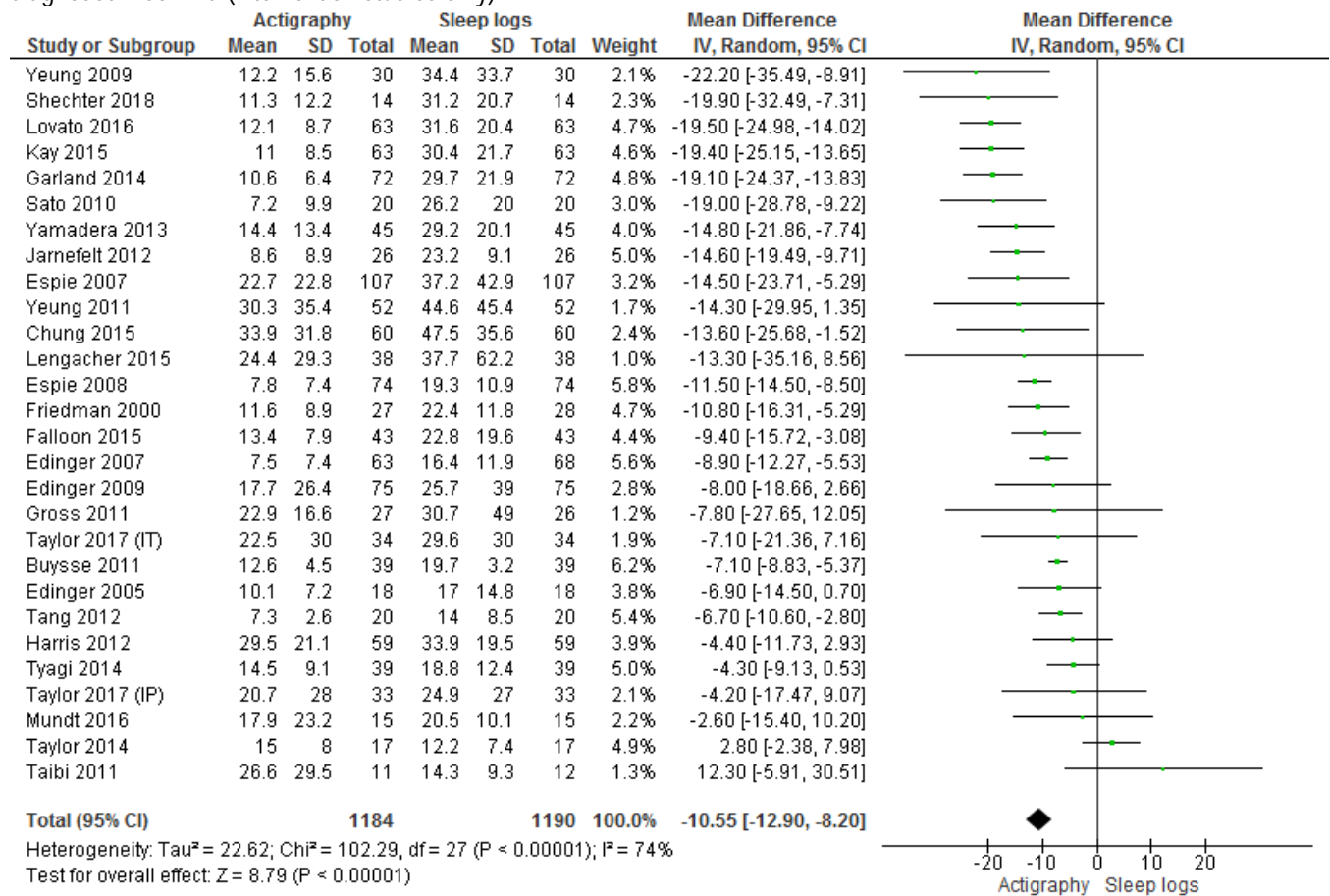


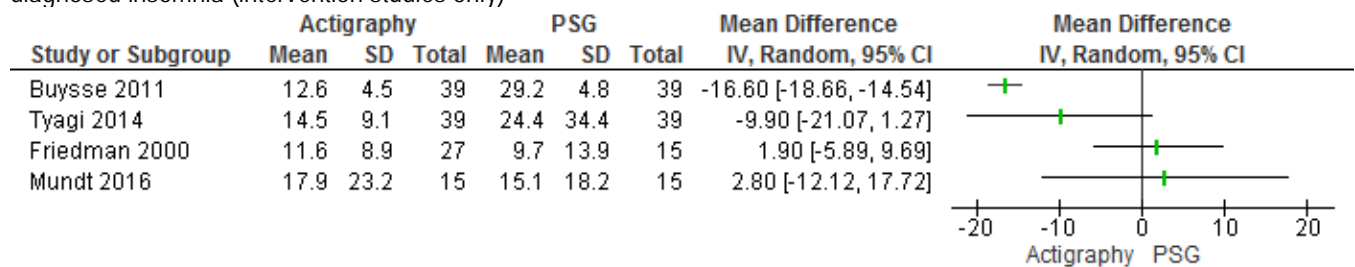
Figure S5b - Comparison of actigraphy to PSG for post-treatment total sleep time (min) in patients with suspected or diagnosed insomnia (intervention studies only)



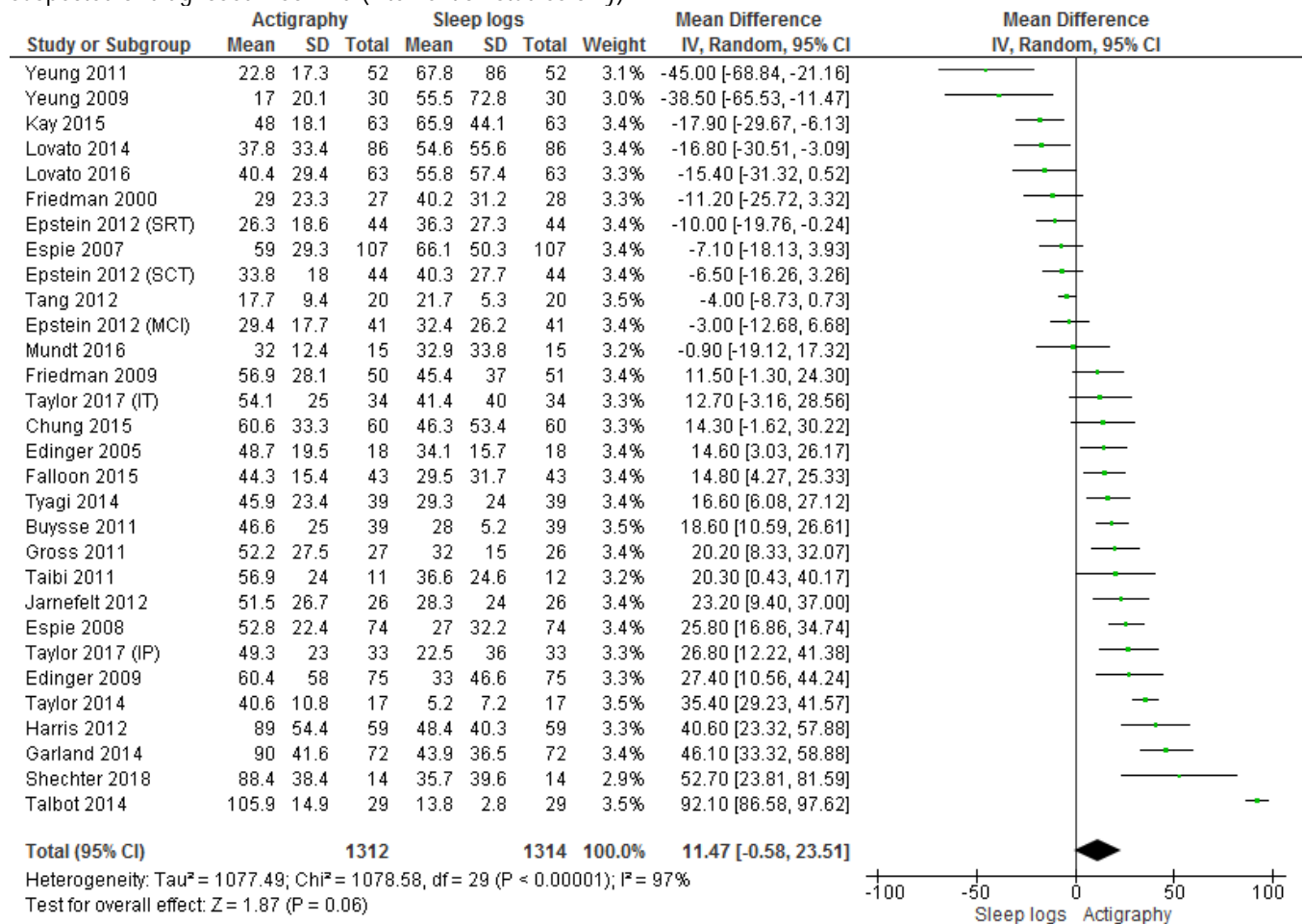
**Figure S6a** - Comparison of actigraphy to sleep logs for post-treatment sleep onset latency (min) in patients with suspected or diagnosed insomnia (intervention studies only)



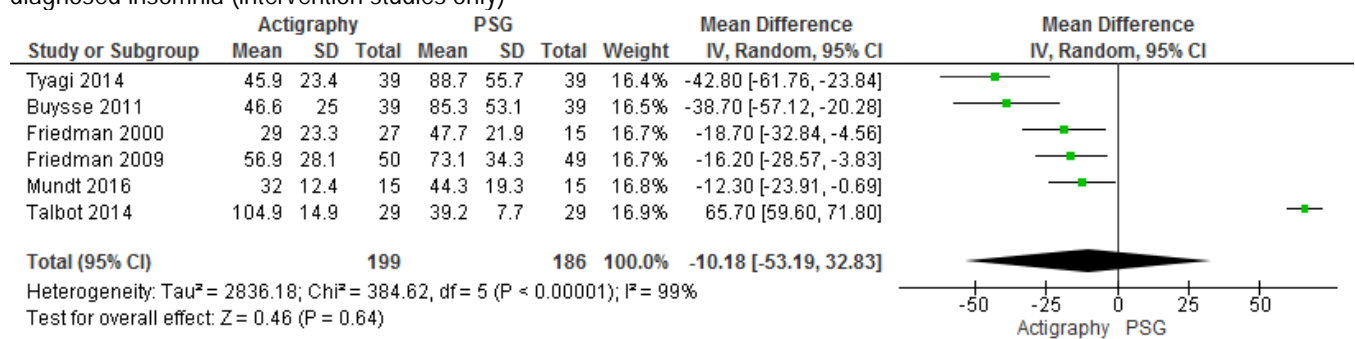
**Figure S6b** - Comparison of actigraphy to PSG for post-treatment sleep onset latency (min) in patients with suspected or diagnosed insomnia (intervention studies only)



**Figure S7a** - Comparison of actigraphy to sleep logs for post-treatment wake after sleep onset (min) in patients with suspected or diagnosed insomnia (intervention studies only)

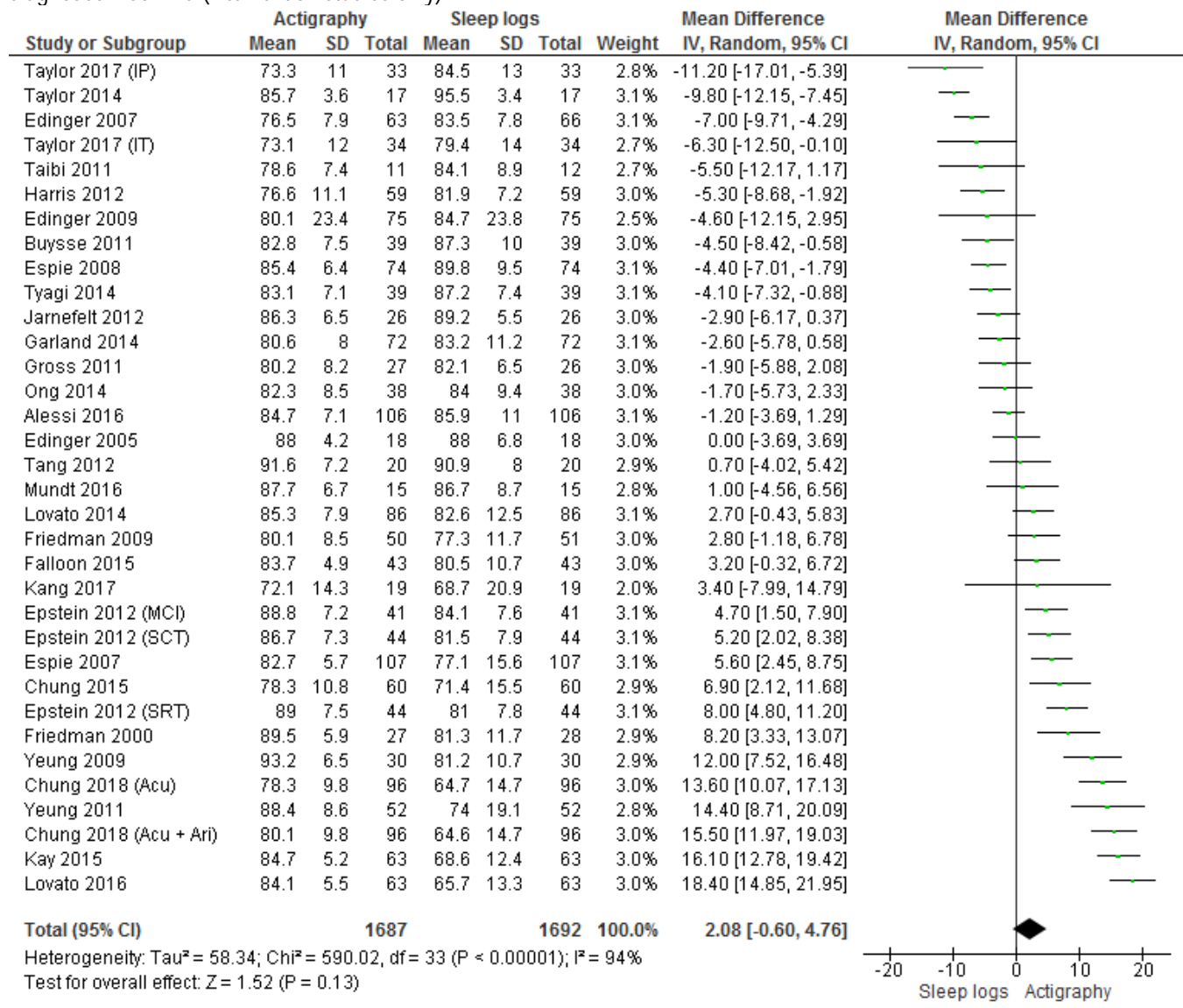


**Figure S7b** - Comparison of actigraphy to PSG for post-treatment wake after sleep onset (min) in patients with suspected or diagnosed insomnia (intervention studies only)

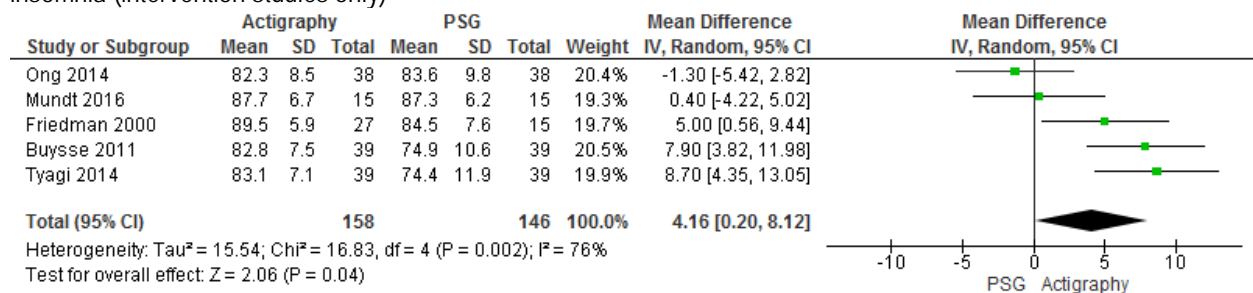




**Figure S8a** - Comparison of actigraphy to sleep logs for post-treatment sleep efficiency (%) in patients with suspected or diagnosed insomnia (intervention studies only)



**Figure S8b** - Comparison of actigraphy to PSG for post-treatment sleep efficiency (%) in patients with suspected or diagnosed insomnia (intervention studies only)



**Table S2a** – Summary of Findings table for actigraphy compared to sleep logs (intervention studies) for the assessment of treatment response in patients with suspected or diagnosed insomnia

References: Alessi 2016 (A); Buysse 2011 (B); Chung 2015 (C); Chung 2018 (D); Edinger 2005 (E); Edinger 2007 (F); Edinger 2009 (G); Epstein 2012 (H); Espie 2007 (I); Espie 2008 (J); Falloon 2015 (K); Friedman 2000 (L); Friedman 2009 (M); Garland 2014 (N); Gross 2011 (O); Harris 2012 (P); Jarnefelt 2012 (Q); Kang 2017 (R); Kay 2015 (S); Lengacher 2014 (T); Lovato 2014 (U); Lovato 2016 (V); Mundt 2016 (W); Ong 2014 (X); Sato 2010 (Y); Shechter 2018 (Z); Taibi 2011 (AA); Talbot 2014 (BB); Tang 2012 (CC); Taylor 2014 (DD); Taylor 2017 (EE); Tyagi 2014 (FF); Yamadera 2013 (GG); Yeung 2009 (HH); Yeung 2011 (II)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S5a)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy was <b>8.10 minutes higher</b> <sup>2</sup> (9.23 lower to 25.42 higher) as compared to sleep logs	1520 (30 studies) <sup>B,D,H,J,Q,S,II</sup>
SOL* (see Figure S6a)	⊕⊕⊕⊕ HIGH	The mean difference in SOL measured by actigraphy was <b>10.55 minutes lower</b> <sup>2</sup> (12.90 lower to 8.20 lower) as compared to sleep logs	1190 (27 studies) <sup>B,C,E,G,I,L,N,Q,S,T,V,W,Y,AA,CC,II</sup>
WASO* (see Figure S7a)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in WASO measured by actigraphy was <b>11.47 minutes higher</b> <sup>2</sup> (0.58 lower to 23.51 higher) as compared to sleep logs	1314 (27 studies) <sup>B,C,E,G,Q,S,U,W,Z,AA,FF,HH,II</sup>
SE* (see Figure S8a)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in SE measured by actigraphy was <b>2.08 % higher</b> <sup>2</sup> (0.60 lower to 4.76 higher) as compared to sleep logs	1692 (30 studies) <sup>A,S,U,X,AA,CC,FF,HH,II</sup>

\* Critical Outcome

<sup>a</sup> 95% CI crosses clinical significance threshold.

<sup>1</sup> Meets clinical significance threshold

<sup>2</sup> Does not meet clinical significance threshold

**Table S2b** – Summary of Findings table for actigraphy compared to PSG (intervention studies) for the assessment of treatment response in patients with suspected or diagnosed insomnia

References: Buysse 2011 (A); Friedman 2000 (B); Friedman 2009 (C); Mundt 2016 (D); Ong 2014 (E); Talbot 2014 (F); Tyagi 2014 (G)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs PSG	No of Participants (studies)
TST* (see Figure S5b)	⊕⊕⊕○ MODERATE <sup>a</sup>	The width of the 95% CI of the mean difference in TST measured by actigraphy as compared to PSG was <b>83.40 minutes</b> <sup>2</sup>	237 (7 studies) <sup>A,G</sup>
SOL* (see Figure S6b)	⊕⊕⊕○ MODERATE <sup>b</sup>	The width of the 95% CIs of the mean difference in SOL measured by actigraphy as compared to PSG ranged from <b>4.12 to 29.84 minutes</b> <sup>1</sup>	120 (4 studies) <sup>A,B,D,G</sup>
WASO* (see Figure S7b)	⊕⊕⊕○ MODERATE <sup>a</sup>	The width of the 95% CI of the mean difference in WASO measured by actigraphy as compared to PSG was <b>86.02 minutes</b> <sup>2</sup>	237 (6 studies) <sup>A,D,F,G</sup>
SE* (see Figure S8b)	⊕⊕⊕○ MODERATE <sup>a,b</sup>	The width of the 95% CI of the mean difference in SE measured by actigraphy as compared to PSG was <b>7.92 %</b> <sup>2</sup>	195 (5 studies) <sup>A,B,D,E,G</sup>

\* Critical Outcome

<sup>a</sup> 95% CI exceeds clinical significance limits.

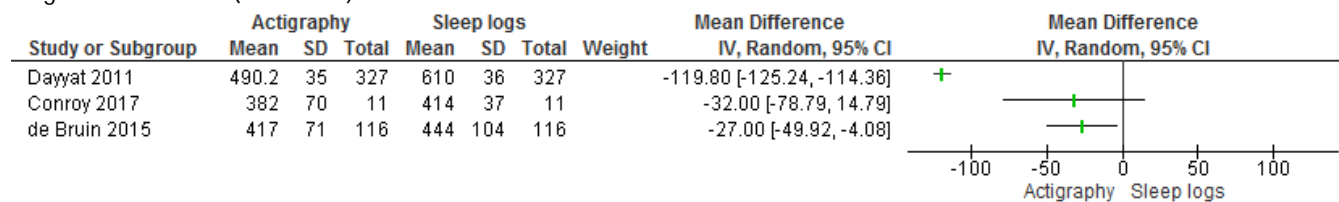
<sup>b</sup> Imprecision due to small sample size.

<sup>1</sup> Within clinical significance limits

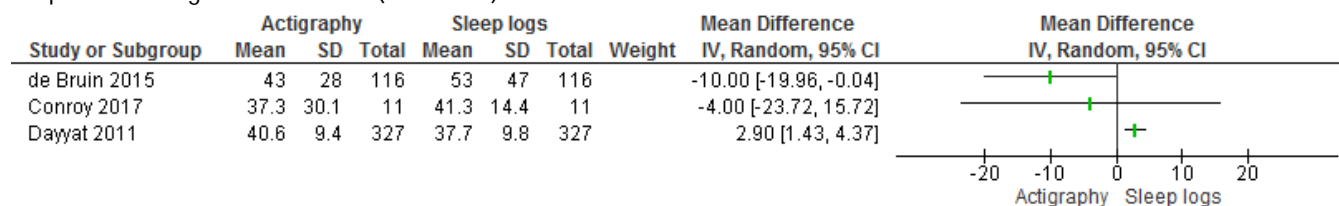
<sup>2</sup> Exceeds clinical significance limits

## Insomnia in Pediatric Populations

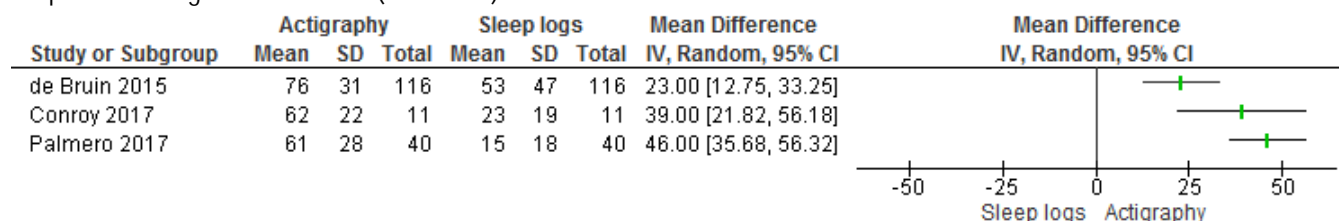
**Figure S9** - Comparison of actigraphy to sleep logs for baseline total sleep time (min) in pediatric patients with suspected or diagnosed insomnia (all studies)



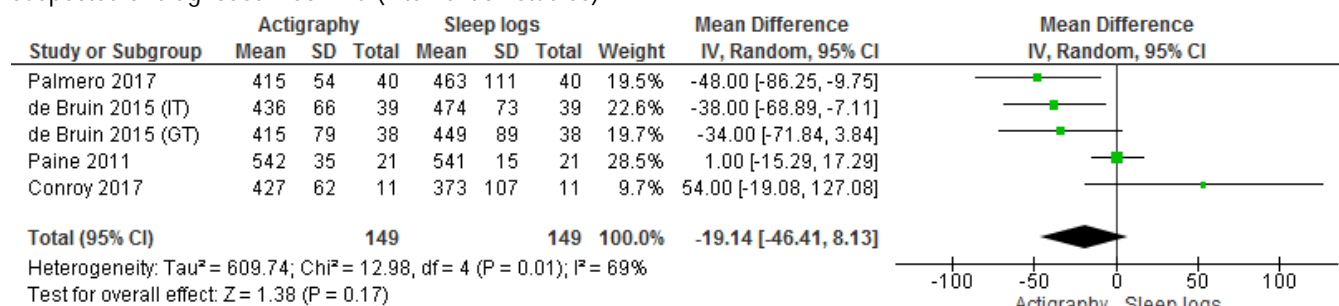
**Figure S10** - Comparison of actigraphy to sleep logs for baseline sleep onset latency (min) in pediatric patients with suspected or diagnosed insomnia (all studies)



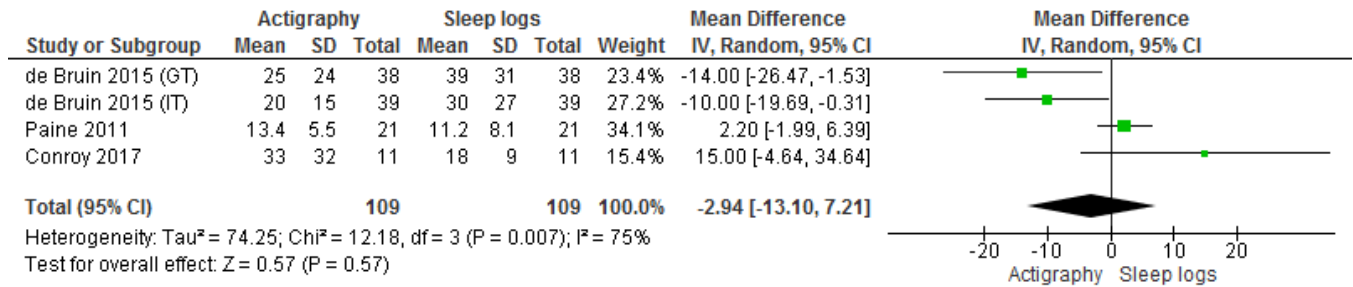
**Figure S11** - Comparison of actigraphy to sleep logs for baseline wake after sleep onset (min) in pediatric patients with suspected or diagnosed insomnia (all studies)



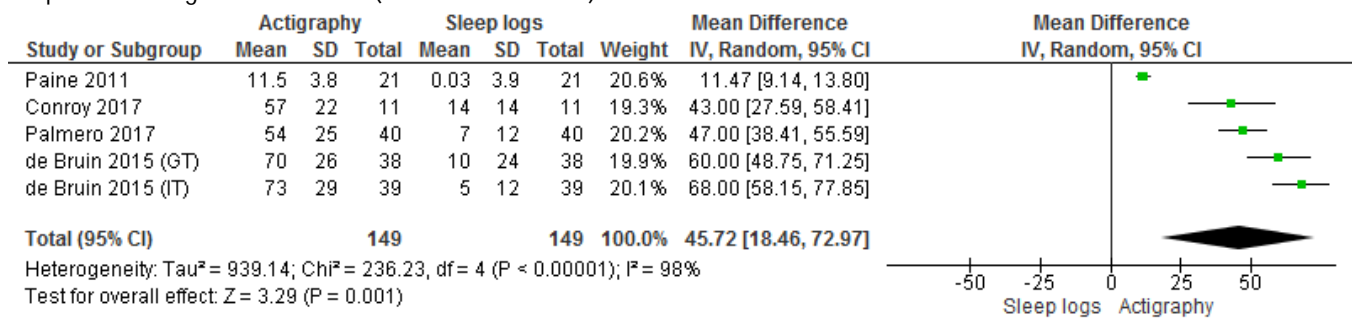
**Figure S12** - Comparison of actigraphy to sleep logs for post-treatment total sleep time (min) in pediatric patients with suspected or diagnosed insomnia (intervention studies)



**Figure S13** - Comparison of actigraphy to sleep logs for post-treatment sleep onset latency (min) in pediatric patients with suspected or diagnosed insomnia (intervention studies)



**Figure S14** - Comparison of actigraphy to sleep logs for post-treatment wake after sleep onset (min) in pediatric patients with suspected or diagnosed insomnia (intervention studies)



**Table S3** – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of baseline sleep parameters in pediatric patients with suspected or diagnosed insomnia

References: Conroy 2017 (A); Dayyat 2011 (B); de Bruin 2015 (C); Palmero 2017 (D)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S9)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy ranged from 27.0 minutes lower to 119.8 minutes lower <sup>1</sup> as compared to sleep logs	454 (3 studies) <sup>A,B,C</sup>
SOL* (see Figure S10)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in SOL measured by actigraphy ranged from 10.0 minutes lower to 2.9 minutes higher <sup>2</sup> as compared to sleep logs	454 (3 studies) <sup>A,B,C</sup>
WASO* (see Figure S11)	⊕⊕⊕○ MODERATE <sup>b</sup>	The mean difference in WASO measured by actigraphy ranged from 23.0 to 46.0 minutes higher <sup>1</sup> as compared to sleep logs	167 (3 studies) <sup>A,C,D</sup>

\* Critical Outcome  
<sup>a</sup> 95% CI crosses clinical significance threshold  
<sup>b</sup> Imprecision due to small sample size  
<sup>1</sup> Meets clinical significance threshold  
<sup>2</sup> Does not meet clinical significance threshold

**Table S4 – Summary of Findings table for actigraphy compared to sleep logs (intervention studies) for the assessment of treatment response in pediatric patients with suspected or diagnosed insomnia**

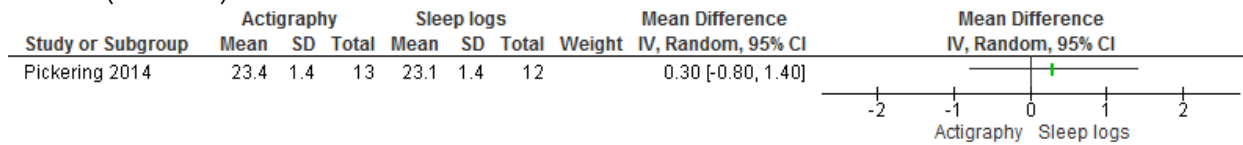
References: Conroy 2017 (A); de Bruin 2015 (B); Paine 2011 (C); Palmero 2017 (D)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S12)	⊕⊕⊕○ MODERATE <sup>a,b,c</sup>	The mean difference in TST measured by actigraphy was <b>19.14 minutes lower</b> <sup>2</sup> (46.41 lower to 8.13 higher) as compared with sleep logs	149 (4 studies) <sup>A,D</sup>
SOL* (see Figure S13)	⊕⊕⊕○ MODERATE <sup>b</sup>	The mean difference in SOL measured by actigraphy was <b>2.94 minutes lower</b> <sup>2</sup> (13.10 lower to 7.21 higher) as compared with sleep logs	109 (3 studies) <sup>A,B,C</sup>
WASO* (see Figure S14)	⊕⊕⊕○ MODERATE <sup>b,c</sup>	The mean difference in WASO measured by actigraphy was <b>45.72 minutes higher</b> <sup>1</sup> (18.46 higher to 72.97 higher) as compared with sleep logs	149 (4 studies) <sup>A,D</sup>

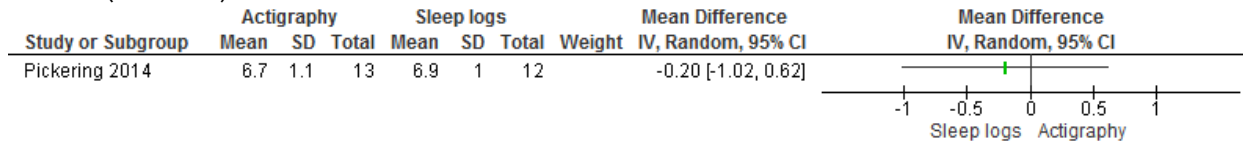
\* Critical Outcome  
a. 95% CI crosses clinical significance threshold.  
b. Small sample size.  
c. 1 of 4 studies fell below the clinical significance threshold  
1. Meets clinical significance threshold  
2. Does not meet clinical significance threshold

## Circadian Rhythm Sleep Wake Disorders in Adult Populations

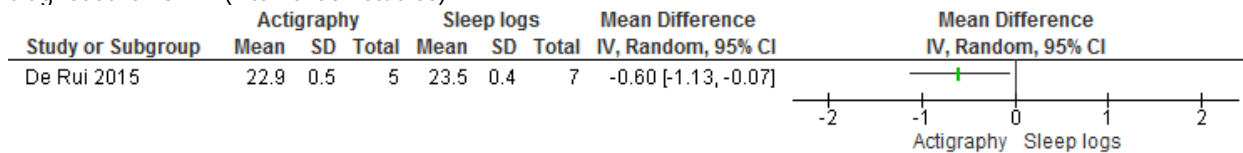
**Figure S15 - Comparison of actigraphy to sleep logs for baseline sleep onset time (h) in patients with suspected or diagnosed CRSWD (all studies)**



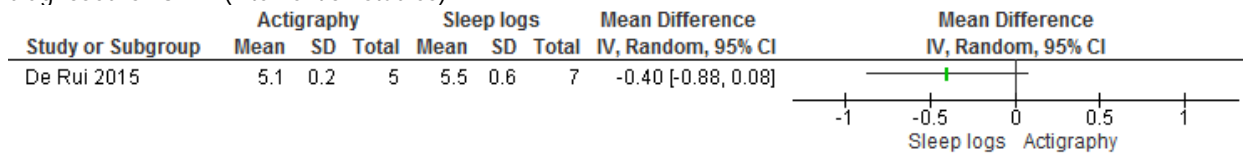
**Figure S16 - Comparison of actigraphy to sleep logs for baseline sleep offset time (h) in patients with suspected or diagnosed CRSWD (all studies)**



**Figure S17 - Comparison of actigraphy to sleep logs for post-treatment sleep onset time (h) in patients with suspected or diagnosed CRSWD (intervention studies)**



**Figure S18 - Comparison of actigraphy to sleep logs for post-treatment sleep offset time (h) in patients with suspected or diagnosed CRSWD (intervention studies)**



**Table S5 – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of sleep parameters in patients with suspected or diagnosed CRSWD**

References: Pickering 2014 (A)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
Sleep onset time* (see Figure S15)	⊕○○○ VERY LOW <sup>a</sup>	The mean difference in sleep onset time measured by actigraphy as compared to sleep logs <b>0.3 hours later</b> <sup>2</sup> (0.8 earlier to 1.4 later)	15 (1 study) <sup>A</sup>
Sleep offset time* (see Figure S16)	⊕○○○ VERY LOW <sup>a</sup>	The mean difference in sleep offset time measured by actigraphy as compared to sleep logs was <b>0.2 hours later</b> <sup>2</sup> (1.02 earlier to 0.62 later)	15 (1 study) <sup>A</sup>

\* Critical Outcome  
<sup>a</sup> 95% CI crosses the clinical significance threshold; very small sample size  
<sup>1</sup> Meets clinical significance threshold  
<sup>2</sup> Does not meet clinical significance threshold

**Table S6 – Summary of Findings table for actigraphy compared to sleep logs (intervention studies) for the assessment of treatment response in patients with suspected or diagnosed CRSWD**

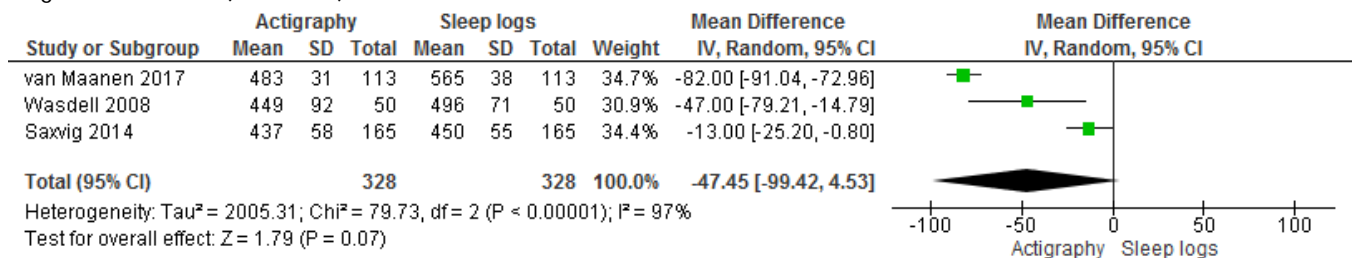
References: De Rui 2015 (A)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
Sleep-onset time* (see Figure S17)	⊕○○○ VERY LOW <sup>a</sup>	The mean sleep-onset time measured by actigraphy was <b>0.6 hours earlier</b> <sup>1</sup> (0.07 to 1.13 hours earlier) as compared to sleep logs	5 (1 study) <sup>A</sup>
Sleep-offset time* (see Figure S18)	⊕○○○ VERY LOW <sup>a</sup>	The mean sleep-offset time measured by actigraphy was <b>0.40 hours earlier</b> <sup>1</sup> (0.88 earlier to 0.08 later) as compared to sleep logs	5 (1 study) <sup>A</sup>

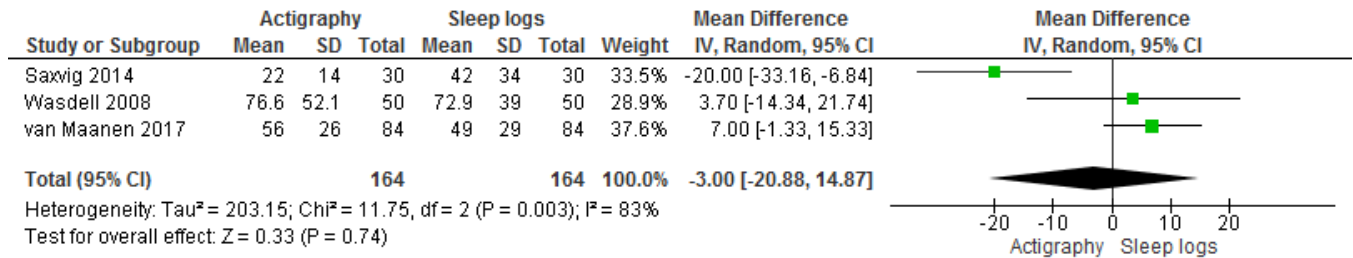
\* Critical Outcome  
<sup>a</sup> 95% CI crosses clinical significance threshold, and very small sample size  
<sup>1</sup> Meets clinical significance threshold  
<sup>2</sup> Does not meet clinical significance threshold

## Circadian Rhythm Sleep Wake Disorders in Pediatric Populations

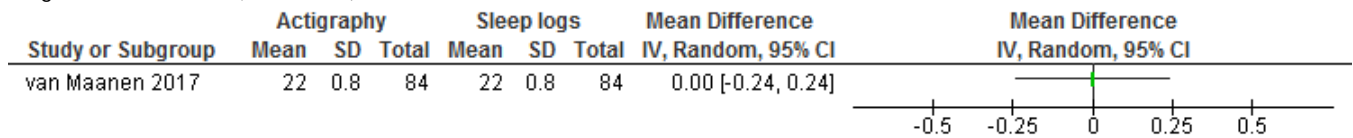
**Figure S19 - Comparison of actigraphy to sleep logs for baseline total sleep time (min) in pediatric patients with suspected or diagnosed CRSWD (all studies)**



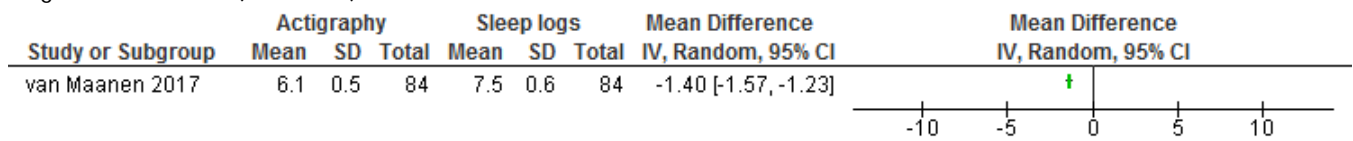
**Figure S20** - Comparison of actigraphy to sleep logs for baseline sleep onset latency (min) in pediatric patients with suspected or diagnosed CRSWD (all studies)



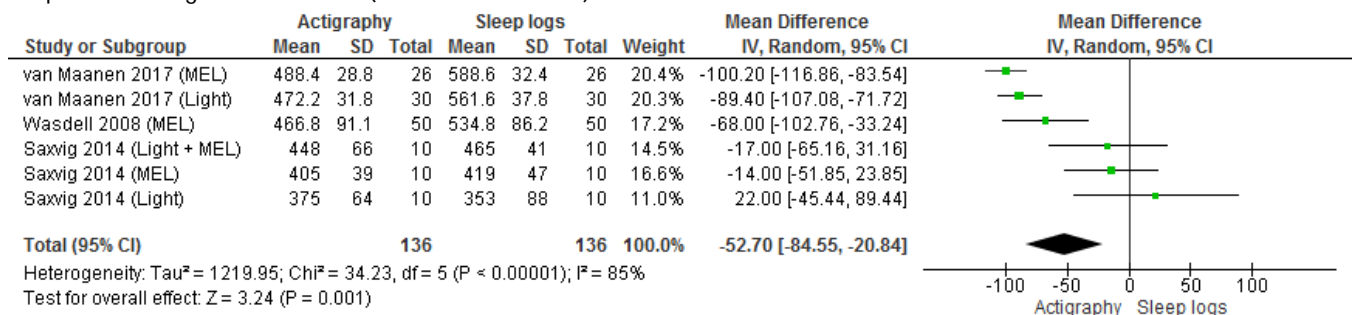
**Figure S21** - Comparison of actigraphy to sleep logs for baseline sleep onset (h) in pediatric patients with suspected or diagnosed CRSWDs (all studies)



**Figure S22** - Comparison of actigraphy to sleep logs for baseline sleep offset (h) in pediatric patients with suspected or diagnosed CRSWDs (all studies)

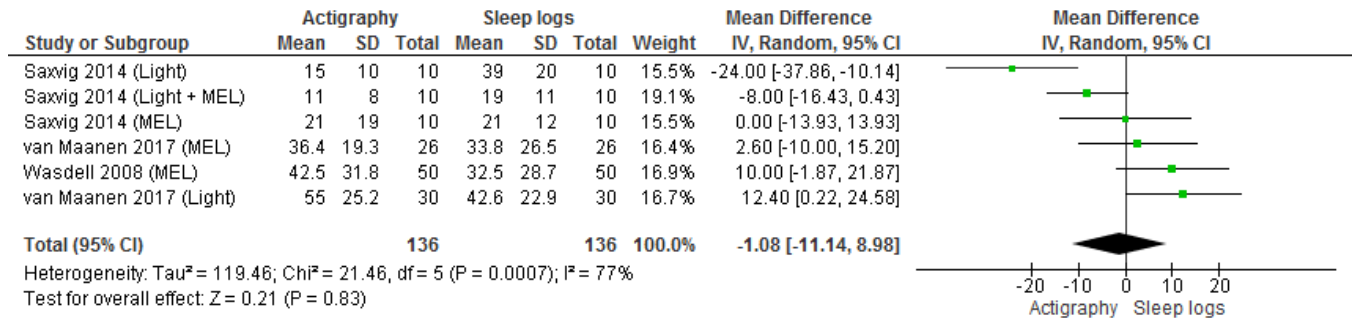


**Figure S23** - Comparison of actigraphy to sleep logs for post-treatment total sleep time (min) in pediatric patients with suspected or diagnosed CRSWD (intervention studies)

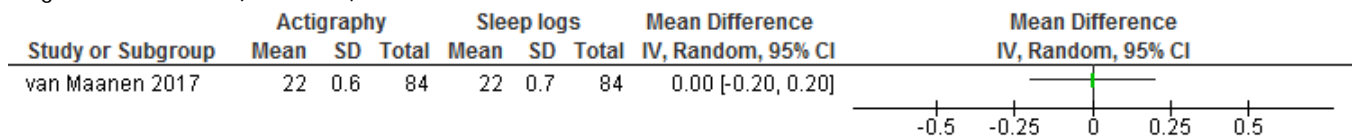




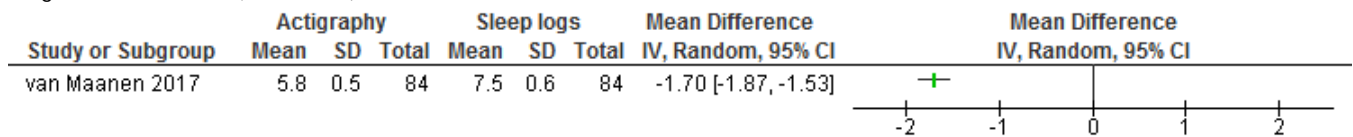
**Figure S24** - Comparison of actigraphy to sleep logs for post-treatment sleep onset latency (min) in pediatric patients with suspected or diagnosed CRSWD (intervention studies)



**Figure S25** - Comparison of actigraphy to sleep logs for post-treatment sleep onset (h) in pediatric patients with suspected or diagnosed CRSWDs (all studies)



**Figure S26** - Comparison of actigraphy to sleep logs for post-treatment sleep offset (h) in pediatric patients with suspected or diagnosed CRSWDs (all studies)



**Table S7** – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of baseline sleep parameters in pediatric patients with suspected or diagnosed CRSWD

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S19)	⊕⊕○○ LOW a,b	The mean difference in TST measured by actigraphy was 47.5 minutes lower <sup>1</sup> (30.5 lower to 73.1 lower) as compared to sleep logs	348 (3 studies) <sup>A-C</sup>
SOL* (see Figure S20)	⊕⊕○○ LOW a,b	The mean difference in SOL measured by actigraphy was 3.0 minutes lower <sup>2</sup> (20.8 lower to 14.9 higher) as compared to sleep logs	164 (3 studies) <sup>A-C</sup>
Sleep onset (see Figure S21)	⊕○○○ VERY LOW a,b	The mean difference in Sleep onset measured by actigraphy was 0.0 hours earlier <sup>2</sup> as compared to sleep logs	84 (1 study) <sup>C</sup>
Sleep offset (see Figure S22)	⊕○○○ VERY LOW a,b	The mean difference in Sleep offset measured by actigraphy was 1.4 hours earlier <sup>1</sup> as compared to sleep logs	84 (1 study) <sup>C</sup>

\* Critical Outcome

a. Small sample size.

b. 95% CI crosses clinical significance threshold

1. Meets clinical significance threshold

2. Does not meet clinical significance threshold



**Table S8 – Summary of Findings table for actigraphy compared to sleep logs (intervention studies) for the assessment of treatment response in patients with suspected or diagnosed CRSWD**

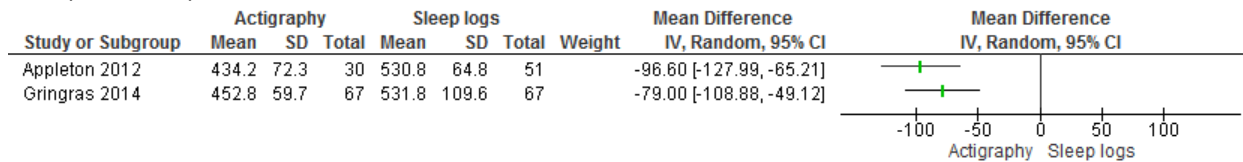
References: Saxvig 2014 (A); van Maanen 2017 (B); Wasdell 2008 (C)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S23)	⊕⊕○○ LOW a,b	The mean difference in TST measured by actigraphy was <b>52.7 minutes lower</b> <sup>1</sup> (20.8 lower to 84.5 lower) as compared to sleep logs	136 (3 studies) <sup>A-C</sup>
SOL* (see Figure S24)	⊕⊕○○ LOW a,b	The mean difference in SOL measured by actigraphy was <b>1.1 minutes lower</b> <sup>2</sup> (11.1 lower to 9.0 higher) as compared to sleep logs	136 (3 studies) <sup>A-C</sup>
Sleep onset (see Figure S25)	⊕○○○ VERY LOW a,b	The mean difference in Sleep onset measured by actigraphy was <b>0.0 hours earlier</b> <sup>1</sup> as compared to sleep logs	84 (1 study) <sup>D</sup>
Sleep offset (see Figure S26)	⊕○○○ VERY LOW a,b	The mean difference in Sleep offset measured by actigraphy was <b>1.7 hours earlier</b> <sup>1</sup> as compared to sleep logs	84 (1 study) <sup>D</sup>

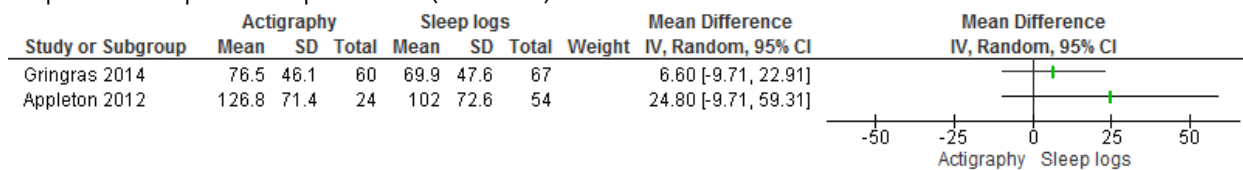
\* Critical Outcome  
a. 95% CI crosses clinical significance threshold.  
b. Small sample size.  
<sup>1</sup>. Meets clinical significance threshold  
<sup>2</sup>. Does not meet clinical significance threshold

## Non-specific Sleep Disorders in Pediatric Populations

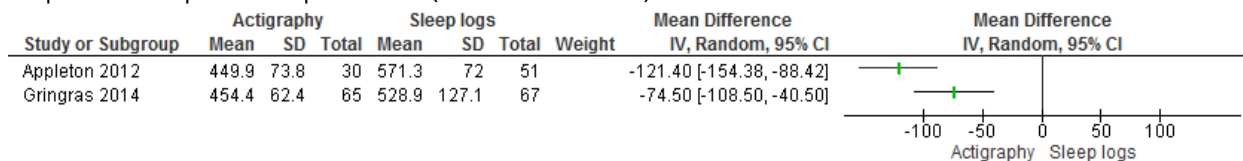
**Figure S27 - Comparison of actigraphy to sleep logs for baseline total sleep time (min) in pediatric patients with suspected non-specific sleep disorders (all studies)**



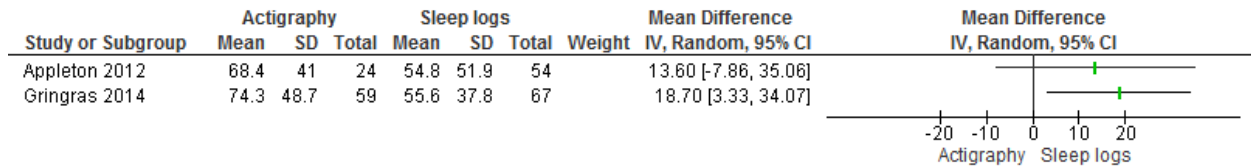
**Figure S28 - Comparison of actigraphy to sleep logs for baseline sleep onset latency (min) in pediatric patients with suspected non-specific sleep disorders (all studies)**



**Figure S29 - Comparison of actigraphy to sleep logs for post-treatment total sleep time (min) in pediatric patients with suspected non-specific sleep disorders (intervention studies)**

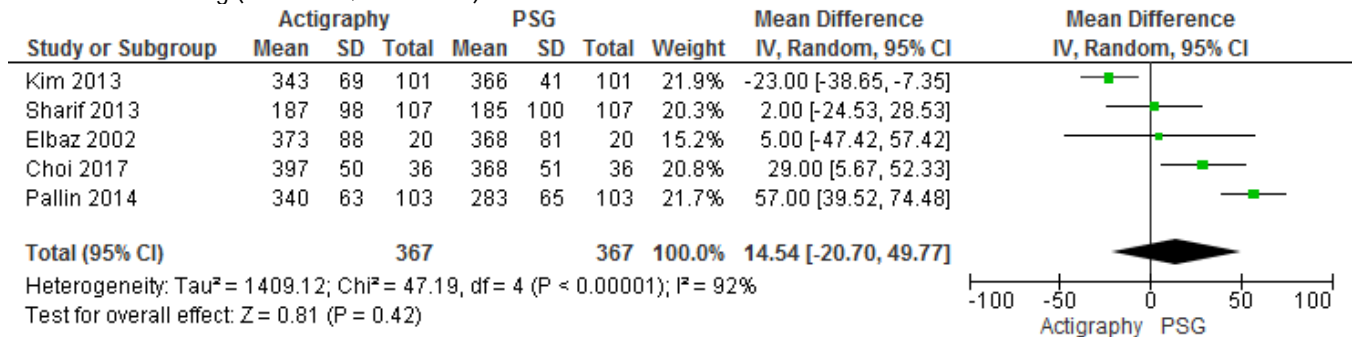


**Figure S30** - Comparison of actigraphy to sleep logs for post-treatment sleep onset latency (min) in pediatric patients with suspected non-specific sleep disorders (intervention studies)



## Sleep Disordered Breathing in Adult Populations

**Figure S31** - Comparison of actigraphy to PSG for total sleep time (min) in patients with suspected or diagnosed sleep disordered breathing (all studies; non-RCTs)



\*Note: Data provided by Kim 2013 for individual algorithms has been pooled into a single estimate

**Table S9** – Summary of Findings table for actigraphy compared to PSG (all studies) for the assessment of sleep parameters in patients with suspected or diagnosed sleep disordered breathing

References: Choi 2017 (A); Elbaz 2002 (B); Garcia-Diaz 2007 (C); Kim 2013 (D); Pallin 2014 (E); Sharif 2013 (F)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs PSG	No of Participants (studies)
TST* (see Figure S31)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy as compared to PSG was <b>14.54 minutes<sup>1</sup></b> higher (20.7 lower to 49.8 higher)  The width of the 95% CI of the mean difference in TST measured by actigraphy as compared to PSG was <b>70.47 minutes<sup>2</sup></b>	367 (5 studies) <sup>A,B,D,F</sup>
Accuracy of AHI	⊕⊕○○ LOW <sup>b,c</sup>	Sensitivity and specificity of AHI calculated with actigraphy-estimated TST in moderate to severe SDB cases ranged from 84% <sup>1</sup> -100% <sup>1</sup> and 88% <sup>1</sup> -100% <sup>1</sup> , respectively.	186 (3 studies) <sup>B,C,E</sup>

\* Critical Outcome

<sup>a</sup> 95% CI of exceeds limits

<sup>b</sup> Very small sample size

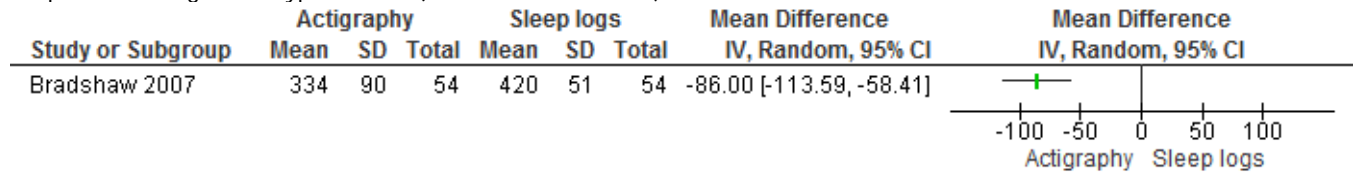
<sup>c</sup> Indirect comparison of HSAT with actigraphy vs PSG (instead of HSAT with and without actigraphy)

<sup>1</sup> Within clinical significance limit

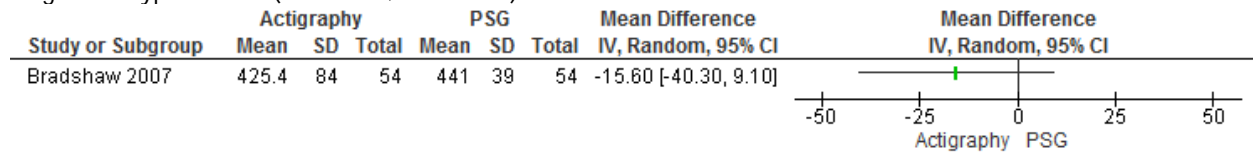
<sup>2</sup> Exceeds clinical significance limit

## Central Disorders of Hypersomnolence in Adult Populations

**Figure S32a** - Comparison of actigraphy to sleep logs for total sleep time (min) the weeks prior to MSLT in patients with suspected or diagnosed hypersomnia (all studies; non-RCTs)



**Figure S32b** - Comparison of actigraphy to PSG for total sleep time (min) the night prior to MSLT in patients with suspected or diagnosed hypersomnia (all studies; non-RCTs)



**Table S10a** – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of TST in weeks prior to MSLT in patients with suspected or diagnosed hypersomnia

References: Bradshaw 2007 (A)			
Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S32a)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy was <b>86.0 minutes lower</b> <sup>1</sup> (113.6 to 58.4 minutes lower) as compared to sleep logs	54 (1 study) <sup>A</sup>

\* Critical Outcome  
<sup>a</sup>. Imprecision due to small sample size  
<sup>1</sup>. Meets clinical significance threshold

**Table S10b** – Summary of Findings table for actigraphy compared to PSG (all studies) for the assessment of sleep parameters in patients with suspected or diagnosed hypersomnia

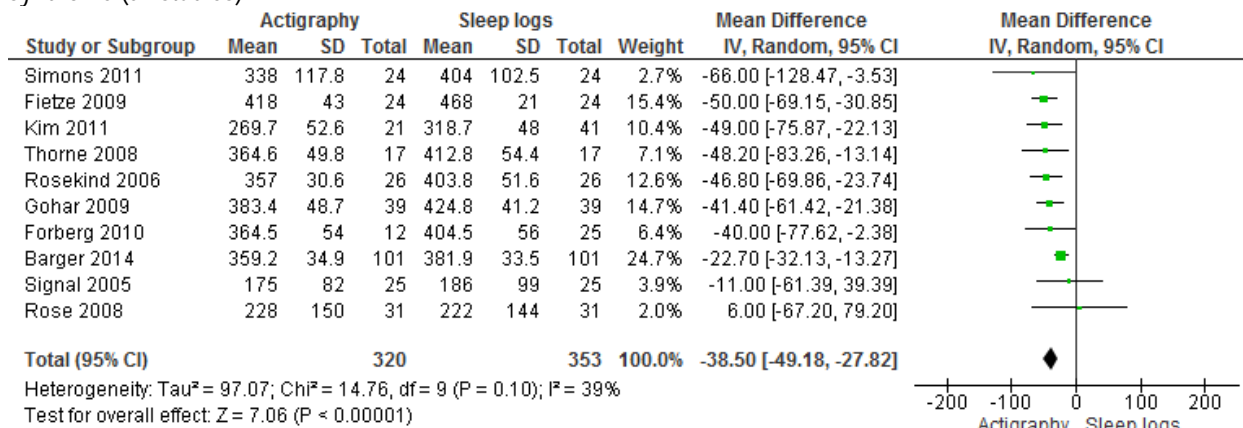
References: Bradshaw 2007 (A)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs PSG	No of Participants (studies)
TST* (see Figure S32b)	⊕⊕⊕○ MODERATE <sup>a</sup>	The mean difference in TST measured by actigraphy as compared to PSG was <b>15.6 minutes<sup>1</sup></b> lower (40 lower to 9 higher)  The width of the 95% CI of the mean difference in TST measured by actigraphy as compared to PSG was <b>49.4 minutes<sup>2</sup></b>	54 (1 study) <sup>A</sup>

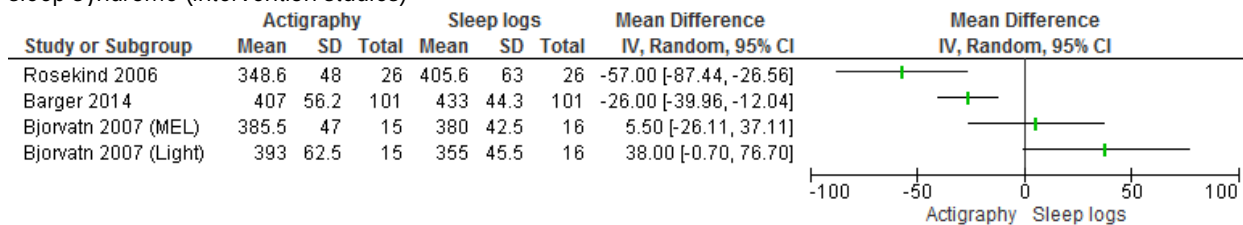
\* Critical Outcome  
<sup>a</sup>. 95% CI exceeds clinical significance limit and small sample size  
<sup>1</sup>. Meets clinical significance threshold  
<sup>2</sup>. Exceeds clinical significance limit

### Insufficient Sleep Syndrome in Adult Populations

**Figure S33** - Comparison of actigraphy to sleep logs for baseline total sleep time (min) in patients with risk of insufficient sleep syndrome (all studies)



**Figure S34** - Comparison of actigraphy to sleep logs for post-treatment total sleep time (min) in patients with risk of insufficient sleep syndrome (intervention studies)



**Table S11** – Summary of Findings table for actigraphy compared to sleep logs (all studies) for the assessment of baseline sleep parameters in patients with risk of insufficient sleep syndrome

References: Barger 2014 (A); Fietze 2009 (B); Forberg (C); Gohar 2009 (D); Kim 2011 (E); Rose 2008 (F); Rosekind 2006 (G); Signal 2005 (H); Simons 2011 (I); Thorne 2008 (J)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S33)	⊕⊕⊕⊕ HIGH	The mean difference in TST measured by actigraphy was <b>38.5 minutes lower</b> <sup>1</sup> (49.2 lower to 27.8 lower) as compared to sleep logs	371 (10 studies) <sup>A-J</sup>

\* Critical Outcome

<sup>1</sup> Meets clinical significance threshold

<sup>2</sup> Does not meet clinical significance threshold

**Table S12** – Summary of Findings table for actigraphy compared to sleep logs (intervention studies) for the assessment of treatment response in patients with risk of insufficient sleep syndrome

References: Barger 2014 (A); Bjorvatn 2007 (B); Rosekind 2006 (C)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs Sleep logs	No of Participants (studies)
TST* (see Figure S34)	⊕⊕○○ LOW <sup>a,b,c</sup>	The mean difference in TST measured by actigraphy ranged from <b>57.0 minutes lower</b> to <b>38.0 minutes higher</b> <sup>2</sup> as compared to sleep logs	143 (3 studies) <sup>A-C</sup>

\* Critical Outcome

<sup>a</sup> CI crosses the clinical significance threshold

<sup>b</sup> Imprecision due to small sample size

<sup>c</sup> Heterogeneity of the studies

<sup>1</sup> Meets clinical significance threshold

<sup>2</sup> Does not meet clinical significance threshold

## PLMD Adult and Pediatric Populations

**Figure S35** - Comparison of actigraphy to PSG for periodic limb movement index (PLMI) in patients with suspected or diagnosed PLMD (all studies)

Study or Subgroup	Actigraphy			PSG			Mean Difference IV, Random, 95% CI	Mean Difference IV, Random, 95% CI
	Mean	SD	Total	Mean	SD	Total		
<b>1.1.1 Adults</b>								
Sforza 2005	47.71	35.42	11	51.23	34.13	11	-3.52 [-32.59, 25.55]	
Gschliesser 2009 (Actiwatch)	34.4	30.7	24	37	30.7	24	-2.60 [-19.97, 14.77]	
Kobayashi 2014	30.4	34.4	41	21	28.9	41	9.40 [-4.35, 23.15]	
Gschliesser 2009 (PAM-RL)	63.6	39.3	24	37	30.7	24	26.60 [6.65, 46.55]	
<b>1.1.2 Pediatrics</b>								
Montgomery-Downs 2005	6.85	6.1	99	4	6.6	99	2.85 [1.08, 4.62]	

**Table S13** – Summary of Findings table for actigraphy compared to PSG (all studies) for the assessment of periodic limb movements in patients with suspected or diagnosed periodic limb movement disorder

References: Gschliesser 2009 (A); Kobayashi 2014 (B); Montgomery-Downs 2005 (C); Rogers 2012 (D); Sforza 2005 (E)

Outcomes	Quality of the evidence (GRADE)	Absolute Difference Actigraphy vs PSG	No of Participants (studies)
PLMI* (see Figure S35)	⊕⊕⊕○ MODERATE <sup>a,b</sup>	The mean difference in PLMI measured by actigraphy as compared to EMG ranged from <b>3.5 lower</b> <sup>1</sup> to <b>26.6 higher</b> <sup>2</sup> for adults, and was <b>2.85 higher</b> <sup>2</sup> for pediatric patients  The width of the 95% CIs of the mean difference in PLMI measured by actigraphy as compared to PSG range from <b>27.5</b> <sup>2</sup> to <b>58.14</b> <sup>2</sup> for adults, and was <b>3.54</b> <sup>2</sup> for pediatric patients	175 (4 studies) <sup>A,B,C,E</sup>
Accuracy of PLMSI	⊕⊕⊕○ MODERATE <sup>b</sup>	Sensitivity and specificity of PLMSI calculated with actigraphy ranged from 82.4-100% <sup>1</sup> and 8-70.8% <sup>2</sup> , respectively.	61 (2 studies) <sup>B,D</sup>

\* Critical Outcome

a. 95% CI exceeds clinical exceeds clinical significance limit

b. Small sample size

1. Within clinical significance limit

2. Exceeds clinical significance limit