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Actigraphy Evidence Table

Author/Year/Citation #	Actigraph Evid Level	Study Description	# of patients	# contr	% of males	Mean Age ± SD, (range)	Study Outcomes	Condition (diagnosis)	Device	Recording Time (day / hours)	Analysis Method	Algorithms	Standard compared with	Actigraphy Outcomes
{Alessi, 2005 #693}	4b	RCT of nonpharm intervention to improve abnormal sleep/wake patterns in nursing home residents	Enrolled:62 Completed:58	56	23%	87±9	There was a 46% decrease in observed daytime sleep from baseline to post-tx in the intervention group, with essentially no change in the controls. The duration of nighttime awakenings were slightly decreased; with no sig effects on % night sleep or # awakenings measured by actigraphy.	Elderly nursing home residents w/ abnormal sleep/wake patterns	Screen: Minimotionlogger, AMI Intervention: Actillume, AMI	Start: NS End: NS Duration: 72hrs	Actigraphy variables avg'ed over the 72hr period	Action3, AMI	None	Ability to detect treatment effect in a nursing home population. 1) There was a modest decrease in the duration of nighttime awakenings compared to controls (p = 0.042). 2) Actillume showed increase in daytime light levels in int group, but not in cntrl group
{Amin, 2005 #679}	2	Compared the sleep of healthy controls to that of stable children with CF to determine if pts with CF have lower sleep efficiency and if there is a relationship with pulmonary function and sleep disturbance	Enrolled: 93 Completed: 84	40	46.40%	P 11.9 ±2.8 (NS) C 12.0 ±2.8 (NS)	1. Children with CF had more frequent and longer awakenings than healthy children 2. Children with more severe pulmonary disease had more disturbed sleep	Cystic fibrosis	Am-Motion-logger	Start: NS End: NS Duration: 5 weekdays	NS	NS	Sleep Logs	Acti showed that sleep efficiency was reduced with more severe pulmonary disease. There was a significant correlation between acti measured sleep duration and both self (r = 0.71) and parental (r = 0.79) reports in the control, but not for the CF group (acti > questionnaire).
{Ancoli-Israel, 2003 #1359}	5b	Patients were randomly assigned by block stratification (morning, evening, or all-day agitation) to 1 of 3 treatment groups: AM (0930-1130 hrs) Bright, AM Dim Red or Evening (1730-1930 hrs) Bright Light.	Enroll: 92 Compl: 83 (Data available on 72)	NA	32%	82.3 +/- 7.6 (61 – 99 yrs)	Increased Bright Light exposure consolidates nighttime sleep by lengthening max sleep bouts across the night	Alzheimer's Disease CRSD's	Actillume recorder (AMI)	Start: NS End: NS Durat: 18 days (Baseline-3 days, light treatment -10 days, and post-tx f/u-5 days)	ACTION 3 software (AMI)	Day (Wake-up to Bedtime) Night (Bedtime to Wake-up time) Max and Mean minute-by-minute activity	Baseline/Post-Treatment Follow-up Dim Red Light	Acti used as sole outcome measure. No effect on "tradtional sleep measures". Noct sleep consolidation was improved w/tx and persisted across f/u after tx discont.
{Ando, 2002 #999}	3	To examine the prevalence of circadian rhythm sleep disorders (by DSM-IV) in a representative population age 40-64 yrs and compare objectively recorded sleep times of symptomatic subjects with the surveyed population.	Enroll: 417 Compl: 350	NA	45%	51 +/- 7 yrs [40 -64 yrs]	Prevalence of ASPS was 7.4% and DSPS was 3.1% by DSM-IV criteria (combination of both am and pm complaints). No signficant correlations were found comparing sleep complaints with objectively recording sleep timing.	DSPS or ASPS by DSM-IV criteria	Actillume (AMI)	Start: NS End: NS Durat: ~3 days	Sleep Onsets/ Offsets	Custom – (Jean-Louis et al, 2001, Physiol and Behav, 72:21-28)	Sleep Logs Subjective Measures	Average recorded bedtimes were 10 min later and wake times were 22 min later than reported by questionnaire (r = 0.75 and = 0.71, respectively, for subjective vs. objective measures, p < 0.01).
{Armitage, 2004 #1094}	3	To evaluate the circadian rest-activity cycles and locomotor activity in children (8-12 yrs) and adolescents (13-17 yrs), w/ major depressive disorder (MDD) , stratified by sex and age/Tanner stage. A comparison group of age and sex matched healthy controls was included.	Enroll: 59 Compl: 59	41	53%-MDD Ps 51% - Normal Contrs	(8-17 yrs old for all 100 Ps/Contrs) 9.5 to 10.3 yrs= mean age range of pre-teens across group	Adolescents w/ MDD had lower activity levels, damped circadian amplitude, lower total light exposure, and spent less time in BL compared to their age matched controls. Children w/ MDD had lower light exposure and also spent less time in BL but only the depressed pre-teen girls had a damped circadian amplitude. Sex diffs were greater in the MDD group compared to the Contr group.	Children and Adolescents w/ MDD (DSM-IV)	Actiwatch-L (Mini)	Start: Noon End: 9am last AM Durat: 5-days (only 3 days of complete data for 5 Ss)	Mini software	Average activity count/min in the light vs dark pers; time series/Fourier-based spectral analysis	Sleep Logs Subjective Measures- Clinical Interviews, Questionnaires, various scales Med and Neuro/Phvsical	Acti monitoring revealed age, gender, and MDD related differences in activity levels during the day and night. Differences in amplitude of the circadian activity rhythm also detected.
{Asayama, 2003 #655}	4b	Double-blind, randomized allocation, controlled evaluatio of the effects of melatonin (3 mg or placebo at 20:30 for 4 weeks) on the sleep/wake rhythm and cognitive and non-cognitive function in Alzheimer type dementia.	Enrolled: 11 Completed: 10	9	15%	79.2±6.4	Significantly prolonged sleep time and decreased activity level at night in the melatonin group.	Alzheimer type dementia	MiniML (AMI)		3 "serial" days out of 7 were used for analysis	Cole's	NA	Ability to detect treatment effect of melatonin on sleep time and night time acitivity in patients with PRAD
{Baskett, 2003 #783}	3	Randomized, double blind, crossover study assessing sleep in problem and normal sleepers with 5mg melatonin, or matching placebo, taken at BT for 4 wk, separated by 4wk washout period	Enrolled: 20 Completed: 19	20 15	32%	71.7 ± 4.9	Melatonin taken at bedtime did not improve sleep in elderly with sleep maintenance problems or normal sleepers	Age ≥ 65 with age-related sleep maintencance problem or normal sleep	Actiwatch Cambridge Neurotech	Start: NS End: NS Duration: 5 days	NS	Sleepwatch software	Sleep Logs	Overall, there was little difference between subjective and actigraphic measures of sleep quality (latency, duration, efficiency and number of awakenings) in this well designed study. Aside from the number of awakenings (decreased by w/melatonin in normals by actigraphy but not logs), neither measure showed improvements in sleep following tx. Evaluated as one component of multi-modal dx of hypersomni (with specificities ranging from 30 to 78%) Actigraphy records showed Increased sleep time (>9 hr/day) in 11 of 27 patients, including 5/6 patients with hypersomnia associated with a psych disorder
{Bassetti, 2003 #760}	3	To test whether CSF hypocretin-1 levels were low in patients with narcolepsy w/out cataplexy and to test if a multi-modal approach would increase diagnostic specificity in patients with hypersomnia (of primarily neurological origin)	Enroll:27 Compl:27	0	55.50%	38 (16-53)	1. Hypocretin-1 levels were detectible in 24/27 patients, including 2 patients with narcolepsy 2. REM related symptoms were common and not specific to patients with narcolepsy	Hypersomnia, various types	Am, Motion-logger with light sensor	Start:NS End:NS Durat: 1 week	NS	NS	PSG Subjective Measures	
{Beaumont, 2004 #1358}	3	Double-blind, randomized , placebo-controlled, parallel groups study of slow-release Caffeine, Melatonin, or placebo for jet lag (7 time-zone eastbound flight) and sleep deprivation (33-hrs) over a 10-day/9-night f/u period.	Healthy Volunteers Enroll: 27 Compl: 27	NA	67%	35.3 +/- 8.1 (19-47 yrs)	Slow-Release Caffeine alleviated daytime sleepiness but exerted negative effects on sleep. By contrast, Melatonin improved sleep but did not objectively mitigate daytime sleepiness.	Jet lag/Sleep Deprivation	Piezoelectric accelerometer (Gaehwiler Electronic, sensitivity: 0.1G, sampling rate: 8 Hz, band-pass	Start:NS End:NS Durat: 17-days (6-Baseline, 24-hr flight day, 10-Recovery)	NS	Custom designed: movements with a force >0.1G averaged across Morning, Afternoon, and Evening/Night, time segments.	PSG – both in-lab & portable Sleep Logs Subjective Measures Placebo	Significant differences in the 24-hr activity profile occurred between drug (caffeine/melatonin) and baseline conditions. Daytime activity was higher on slow-release caffeine, consistent w/decrease in objective and subjective sleepiness. Indications of impaired sleep w/ SRC, but there was no sleep fragmentation w/actigraphy.
{Benson, 2004 #723}	4a	To determine if there were any differences in the performance of two brands of actigraphs when they were used in a naturalistic setting (home environment)	Enroll:20 Compl:20	NS	35%	35.35 ±11.8 (24-64)	At medium sensitivity, there are no significant differences between TST, WASO, and SE recorded by the two brands of actigraphs		MM Actiwatch-L and Am Mini-Motionlogger Basic	Start: End: Durat: 2 overnight within a 3-weel period	Used the software that came with each device	NS	Algorithms/Devices	1.When actiwatch was configured at medium sensitivity, results similar to motionlger 2. At low sensitivity (actiwatch), recorded less WASO than motionlgger. 3. At high sensitivity (actiwatch), were significant differences i TST, WASO, and SE
{Borges, 2003 #777}	3	To assess the impact of a 12-hr fixed night shift followed by 36-hrs off-time, on the sleep-wake cycle, sleep duration, self-perceived sleep quality, and work-time alertness, in nurses.	Enroll: 20 Compl: 20	NA	15%	34.9 +/- 7.5 yrs	Self-rated sleep quality was best for nocturnal sleep during the rest day off (p<.0001) followed by sleep during the 1st night after night work. Despite napping during the night shift, self-perceived alertness decr w/ the passage of time across night work (p<.0001), with the sleepiest period occurring betw the 7th and 10th hrs of the shift.	Night Shift Workers (Nurses)	Actigraph (AMI)	Start: NS End: NS Durat: 15-days	Actionwin Software (AMI)	Cole-Kripke algorithm (Cole et al, 1990, Sleep Res, 19:364-67)	24-hr Actigraphy Sleep Logs Subjective Measures- Questionnaires, various scales	Wrist actigraphy showed that all nurses slept at least 1hr during 2, of the 7-8, work nights across the 15-day study perio (even against hosp regs). Duration of daytime sleep was shorter than nocturnal sleep after the end of the night shift (p<.0001). Impaired diurnal sleep quality was consistent with self-reports.
{Boulos, 2002 #796}	3	A field study to evaluate the efficacy of a bright light treatment (head-mounted visor) for jet lag following a westward flight across 6 time zones.	Enroll: 20 – Normal Ss Compl: 20	NA	40%	21-34 yrs old	The salivary DLMO (dim-light melatonin onset) resulted in a larger (about an hour) phase delay in the bright light compared to the dim light condition. There was no corresponding improvement in sleep, performance, or subjective ratings of jet lag symptoms.	Jet lag - Normals	Actiwatch-L (Mini-m)	Start: NS End: NS Durat: 17-days	Actiware-Sleep Software	Sleep vs Wakefulness – med sensitivity threshold Act count of 40; <40=Sleep; =/>40=Wake	Sleep Logs (preceding flight only) Subjective Measures Dim red light (10 lux) - Control	Group diff in DLMO but not acti w/tx. There was a group by night interaction for both PSG-SE% and activity level. Sleep questionnaire items did not show any diffs.
{Carney, 2004 #641}	3	To determine if students who were told the actigraph would be used to monitor adherence would be more likel to adhere to sleep hygiene protocols than students who were not told that adherence would be monitored by actigraphy.	Enroll:68 Compl:49	37	25%	Treatment group 20.4 ± 1.47 Control group 19.9 ± 2.17	1. Although sleep diaries showed that both groups of students followed study protocols, students told of monitoring (wearing actigraphs) were more likely to follow study protocols that students not being monitored. 2. Students who did not wear actigraphs went to bed an hour later than reported in their diaries and an hour later than required by study protocols	NA	ActiTrack 3.15C (IM Systems Inc)	Start: End: Durat: 48 hours	software	Visual determination of bedtime and arise times	Sleep Logs	Students wearing an actigraphy were more likely to adhere to study protocols and report sleep times accurately in their diaries than those who were not wearing actigraphs.
{Carvalho Bos, 2003 #1357}	4b	Three field studies were designed to determine whether 24-hr activity records can be used to estimate the sleep and circadian system disruption caused by shift work or time-zone transitions and the process of adjustment. Studies 1 and 2 served as validity pilots for Study 3.	Enroll: Study 1: 8 pilots; Study 2: 12 travelers; Study 3: 117 pilots Compl: Study 1-2: Study	Only Study 2: 15 Normals	Study 1: NS Study 2: 67% Study 3: NS	Study 1: NS Study 2: (22-58 yrs) Study 3: NS	Objective estimates of the disruption to the rest-activity cycle and the circadian system in the field can be obtained by an appropriate analysis of the 24-hour actigraphy record in shift work and time-zone transitions.	Shift Workers/Jet Lag	Actimeter (Cambridge Neurotechnology, UK)	Start: NS End: NS Durat: Study 1: 2-3 mos; Study 2: 4days; Study 3: 4-5 days	Custom	Custom	Algorithms/Devices	Actigraphy results moved in the predicted direction for disruption of sleep caused by shift-work or changes in the sleep/wake rhythm following travel across multiple time zones
{Ceolim, 2000 #1145}	2	The study aimed to examine the sleep/wake cycle across 3 consecutive weeks in healthy elderly.	Enroll:61 Compl:23 Note: 61 volunteered for study, and 23 were selected based on entry criteria (see notes)	ns	35%	70.2 ± 3.6 (65-76)	An association was found between longer duration of physical exercise and greater strength of semicircadian component of the sleep/wake cycle in this sample of healthy, active elderly. Also, individuals that chose earlier times for exercising showed greater exposure to bright light during the day, and reported better sleep quality.	None	Actillume (AMI)	Start: End: Durat: reportedly 23 consecutive days	For "most" variables, authors found significant correlations between actigraphy and sleep log data (p<.05); and only those variables for which correlations between actigraphy and sleep logs had sig level of p<.005 were used (however, the variables were not specified or listed)	Action3 v3.21	Sleep Logs	Only sleep log variables that had a significant correlation with acti at least 74% of subjects were reported (Table 5). These included bedtime, lights out, sleep onset, waking time, total be time, TST, and sleep efficiency.Sleep log variables that were not associated with acti were SOL, sleep interruptions, 24 h TST, and the timing, duration, and number of naps during the day.

{Coffield, 2004 #712}	3	Actigraphy was used to validate/track sleep improvement at discharge compared to admission for a group of consecutively admitted patients w/ MDD. Comparison to a control group was included.	Enroll: 33 Compl: 18	21- neither age, nor sex matched	61%-MDD Ps 29%-Contr Ss (sign diff)	30 +/- 11.7yrs-MDD Ps 40 +/- 11.3yrs-Contr Ss (sign diff)	Depression Scales confirmed clinical improvement post-tx prior to the 2nd week of Actigraphy and sleep logs. SO Lat, # of nighttime awakenings, mins awake after SO, and Sleep Eff%, improved sign from pre- to post-tx actigraphy weeks in the MDD Ps. SO Lat and # of nighttime awakenings were no longer sign diff betw groups during the post-tx actigraphy week. By contrast, sign diffs continued to exist betw MDD Ps and Contr Ss for mins awake after SO and Sleep Eff% during post-tx actigraphy.	Inpatients w/ Major Depressive Disorder (MDD) by DSM-IV	MotionLogger Actigraph (AMI)	Start: NS End: NS Durat: 7 days x 2 (variable period betw 2 sets of Actigraphy in Ps vs Contr Ss)	Action-3 Software (AMI)	Zero-Crossing Mode; Cole-Kripke Scoring algorithm (Cole et al, 1992, Sleep, 5:461-9.	Sleep Logs Subjective Measures – Psycholog testing, Clinical Interviews, various Scales	While post-tx Actigraphy sleep mins were sign corr w/ pre-tx actigraphy values, sleep log reported sleep mins were not in MDD Ps. Sleep log estimates of TST in MDD Ps were consistently greater (13.3-mins at pre-tx; 13-mins at post-tx) than estimated by Actigraphy (p<.001). Sleep logs in MDD Ps overestimated sleep by ~90-mins/week compared to actigraphy .
{Crabtree, 2003 #757}	5a	A restrospective chart review of children with ADHD over a 2-yr period referred to a sleep center was carried out to determine whether they might represent a subset, different from the ADHD children presenting to pediatric, neurology or psychiatric clinics.	Enroll: 97 Compl: only 16 underwent Actigraphy	NA	94% - for the Actigraphy group 77% - for the entire group	7.9 +/-2.8 yrs (5-15 years) of those undergoing Actigraphy 8.3 +/-3.0 yrs (3-18 yrs) for the entire group	The high prevalence of subjective sleep complaints from the parents of ADHD children (presenting to a pediatric sleep center) is only verified by objective sleep assessments (PSG or 24-hr Actigraphy) in a small proportion of cases. Objective sleep assessments are most notable for the high, nocturnal intersubject and intrasubject variability in sleep structure and pattern.	CRSD's in Pediatric ADHD	Actiwatch-L (Mini)	Start: NS End: NS Durat: 14 days	NS	NS	none	16 of the children, suspected of having sleep/wake cycle disorder, were monitored by actigraphy. A 94% incidence of delayed sleep onset. High child and night-to-night variability in sleep was present across the 14-day monitoring period.
{Currie, 2004 #637}	2	The study evaluated whether or not there was agreement between subjective, objective and collateral (e.g., spouse/so/roommate) ratings of insomnia severity in pos withdrawal recovering alcoholics	Enroll:56 Compl:56	0	66%	42.2 ± 10.3 years	1. Average internal consistency between sleep log and actigraphy across 7 nights was 0.91 and 0.85 respectively 2. Scores between patient and collateral raters showed little concordance	Post withdrawal recovering alcoholics	Mini-motion logger (Am)	Start: End: Durat:7 nights	Software by Amb Monitoring based on algorithm by Cole et al (1992)	NA	Sleep Logs Subjective Measures	Sleep logs and actigraphy were significantly correlated for SOL (r = 0.64) and TST (r = 0.46). Estimates of sleet latency were longer for sleep logs than actigraphy, the average disagreement in TST was 55.5 minutes. SEF and WASO were not correlated.
{Currie, 2004 #645}	5b	RCT testing 2 different treatments (cognitive behavioral or self-help with telephone support) compared to placebo (wait-list control) in abstinent alcoholics with disturbed sleep	Enroll:20 20 Compl:15 17 Entire: 10 9 CBT S-H	20 17 9	70%	43.3 ±10.9 (18-70)	Improved subjective sleep measures with either treatment at post-treatment assessment	Abstinent alchoholics with sleep problems	Mini-motionlogger (AM)	Start: End: Durat:7 days	NS	NS	Sleep Logs Subjective Measures	1. Subjective improvements in sleep quality were not mirrored in the mean activity level, no other actigraphy parameters were reported. 2. There were no differences in actigraphically recorded mean activity levels from the baseline period to end of the study.
{Daurat, 2004 #836}	3	A field study to describe the individual diffs in the adopted sleep strategy of a group of intensive care nurses alternating months on 12-hr Day shifts vs 12-hr Night Shifts. The focus was on sleep behaviors around the Night Shifts w/ nurses who napped during the shift vs those who did not. Day Shift, days off served as a Baseline cond.		NA	12%	29.25 +/- 3.4(SE) yrs-Night-Nappers 35.25 +/- 3.3(SE) yrs-Non night Nappers	Half (4 of 8) of the nurses chose to take naps in 75% of their night shifts. Sleep length was sign reduced during night work when compared w/ days off, the result being nap behavior during both day work and night work. Non-night Nappers had long daytime sleep periods and took "preventive" naps in anticipation of sleepiness during night work, but their readjustment to day schedules was assoc w/ complaints of poor sleep quality and their diurnal activity levels were reduced below that of their night work shifts.	Night Shift Workers (Nurses)	Actiwatch (Cambridge Neurotechnology)	Start: NS End: NS Durat: 1-month	Actisom Software (Cambridge, Neurotechnology	Sleep/Nap duration=1st no-movement epoch after 5-mins immobility from LO and last no-movement epoch preceding continuous activity	24-hr Actigraphy Sleep/Nap Logs Subjective Measures – Questionnaires, various scales	Blind, prospective comparison to reference standard The activity index was higher for nighttime sleep on days off for both the day and night shifts (i.e. nighttime sleep was more fragmented than daytime sleep). Mean activity level was lower on the days off during a night shift and was sign lower compared to when on duty. For non-night nappers, their activit level during the night shift was higher compared to the night nappers who had lower activity levels when on duty compared to their days off.
{De Leersnyder, 2001 #1143}	3	To determine the circadian rhythm of melatonin in the Smith-Magenis syndrome (SMS) known to cause sleep disturbances and behavioral problems.	Enroll: 20 Compl: 8 completed Actigraphy	30– for entire study For the 24-hr PSG, hormone	55% of SMS group 62% of hosp SMS	All SMS Ps: 4-17 yrs 8 hosp SMS Ps: 4-17 yrs	All children/adolescents with SMS had a night/day inversion of their circadian rhythm of melatonin compared to controls. Behavioral tantrums correlated with the melatonin rise and may have reflected a struggle against sleep.	CRSD's in Pediatric SMS	Actiwatch-score (Cambridge, Neurotechnology	Start: NS End: NS Durat: 8-14 days	Ave. Activity Offset and Onset	Actiwatch Software Programs	24-hr portable PSG (Oxford Medilog 90000 Sleep Logs Subjective Measures	"Actigraphy in the 8 hosp children correlated with sleep diaries and confirmed instability of sleep, frequent microarousals, and naps during the day (Fig 1)," p113. Naps and sleep attacks occurred in SMS when melatonin peaked at midday and in the evening, during the evening meal.
{de Souza, 2003 #782}	1	To evaluate the concordance between PSG and two algorithms for scoring actigraphy recordings (1. Cole's, and 2. Sadeh's,	Enroll:21 Compl:21	NA	33%	NS	See actigraphy outcomes	NA	Am; Mini-Motionlogger Basic 32 C	Start:NS End:NS Durat:NS	Recordings scored as wake vrs sleep, then each one minute epoch compared	1. Coles' algorithm (Action 3, vrs 3.15 AMI) 2. Sadeh's algorithm (Action for Windows vrs 1.05 AMI)	PSG Algorithms	1. 91% of all epochs identified as sleep on PSG were correctly identified by both algorithms 2. Actigraphy systematically overestimated sleep latency, TST, and sleep efficiency while it underestimated intermittent awakenings
{Denise, 2003 #780}	4b	Double-blind cross-over study evaluating the effects of a single dose of zolpidem, zopiclone, flunitrazepam, and placebo on night-time motor activity	Enroll:33 Compl:33	NA	63.60%	27.5 (20-67)	1. All three drugs significantly reduced activity level and movement time on treatment night compared to placebo. 2 Mean duration of uninterrupted immobility was also increased by hypnotics compared to placebo. 3. Increased activity on first or second post-drug night with zolpidem and soplicon respectively.	NA	Gaehwiler Electronic	Start:when ss took sleeper at night End: end of 1st night for 16 ss, end of 3rd night for 17 ss Durat: variable	1. Mean activity count 2. movement index 3. duration of uninterupted immobility periods as described in Middlekoop et al 1993	Start and end of sleep period determined by smoothing.	None	Differences in activity level, uninterrupted mobility, and movement time distinguished between drug and non-drug nights
{Dowling, 2005 #685}	4b	The goal of this study was to test the effectiveness of morning bright light therapy in reducing rest-activity (circadian) disruption in institutionalized patients with severe AD. Authors state it was a randomized, placebo-controlled trial of usual light compared to bright light therapy.	Enroll: Compl:29	17	22%	84 ± 10 (60-98) For entire sample (n=46); Age not reported by group	Morning bright light exposure protocol did not induce an overall improvement in measures of sleep or of rest-activity rhythm	NINCDS-ADRDA Alzheimer Disease criteria	Actiwatch (MM)	Start:ns End:ns Durat:6 dys/7nts at baseline; 5dys & nights during last week of intervention	Primary outcome variables were SE, sleep time, wake time, and #wake.	Actiware Sleep Version 3.2 program	None	In a subgroup of the subjects who had desynchronized timing of rest-activity rhythm at baseline (defined as those who experienced their 10 most active hrs during typical sleep hours), sleep efficiency, night sleep and wake times were all improved at the end of the intervention.
{Edinger, 2004 #711}	2	To determine if any of several devices (actigraphy, REM view sleep assessment device, and sleep logs provide accurate assessments of common sleep parameters when compared to PSG recordings	Enroll:38 Compl:33		90%	58.6 ±13.5	All devices tested differed from PSG on at least some variable	All patients had complaints of insomnia; however, at least 14 of the participants also had other sleep disorders ee.g., OSA (n=10), PLMS (n=3), and hypnotic dependant sleep disorder (n=1).	MM, Actiwatch	Start:NS End:NS Durat: I night	NS	NS	PSG Devices	Actigraphy differed from PSG for TST, WASO, TWT and sleep efficiency. Time in bed and SOL were similar for acti and PSG, and were more highly correlated than for sleep logs.
{Elbaz, 2002 #802}	1	Compared AHI based on acitgraphic estimate of TST wit AHI based on PSG	Enroll: 20 Complete:20	NA	75%	52±15	Correlaton of actigraphic AHI with PSG-AHI was good (r=0.976, p<0.0001). Bland-Altman comparison showed best accuracy at AHI<25. Only one patient was over-classified (and none underclassified) as to OSA severity using the acti-AHI measure. Sensitivity for acti AHI in determining the presence of severe OSA (=psg AHI>=30) was sensitivity 88%, specificity 92.5%.	PSG confirmed OSA	Actiwatch	Start: ns End:ns Durat: 1 night	>40 movements/epoch	Sleepwatch	PSG	The Pearson correlation coefficient between the polygraphyderived total sleep time and actimetry-derived total sleep time was 0.74, p<0.0001.
{El-Sheikh, 2005 #697}	4b	To examine how well children's emotional intensity (scale ratings by mother) and vagal functioning during a baseline and a RT task predict sleep problems (actigraphy) in healthy, elementary school-aged children.	Enroll: 41 Compl: 41	NA	56%	10.06 +/-1.74 yrs (6-13 years)	Incr Emotional intensity was predictive of a reduced amount of sleep and incr night activity. Reduced vagal regulation (lower levels of RSA suppression to the RT task) predicted incr sleep probs by both subjective scales/logs and actigraphy.	Healthy Children	Actiwatch-64 (Mini	Start: Bedtime End: AM Rise-time Durat: 4 nights	Actiwatch-Score Software	Medium Sens.=Activity count of 40; Act<40=Sleep w/ weighting of adjacent epochs, Act=/>40=Wake	Sleep Logs Subjective Measures: various scales	Partial correlations (controlling for demographic variables) between acti and overall SHS sleep/wake problems scale wen not significant. The factor of sleep dissatisfaction was moderately correlated with sleep time, sleep efficiency and total activity.
{Fallone, 2002 #794}	3	To determine if school aged children would comply with two experimental manipulations in their sleep time (sleep restriction and an optimized sleep condition) in a home setting	Enroll:84 Compl:78	0	52.60%	10.2 (6.5-12.9 years)	The majority of children aged 6-12 complied were successful in following experimental protocols in a home setting (actigraphy recordings showed significant differences in their sleep times during the three conditions)	NA	Am, Mini-motionlogger	Start:NS End:NS Durat: averaged 11 24-hour periods/child during experimental portion of study	"our standardized method that uses a validated algorithm" then cites Sadeh et al, 1994	Sleep Logs	Successfully recorded acti for 72 of 84 children. Differences fo bed time, sleep period, gender, and the experimental conditions were observed.

{Ferber, 2002 #790}	3	To determine if massage therapy would serve as a time cue and enhance the development of circadian rhythms in infants.	Enroll:26 Compl:21	8	NS	All infants were studied at 6 and 8 weeks of age	Nocturnal melatonin peaks at 8 weeks were higher in infants who had received daily massages, suggesting that daily massage functioned as a time cue	Healthy infants	Somniter (Neurim Pharmaceutics)	Start:NS End:NS Durat: 20 hrs	NS	NS	Melatonin Levels	Periods of peak activity were delayed in treated infants at 8 weeks of age (3 am to 7am vrs 11 pm to 3 am in control infants). Nocturnal melatonin levels were also higher with massage therapy.
{Fetveit, 2002 #806}	3	Study compared nurse observations of sleep/wake patterns in long-term nursing home residents to actigraphy recordings	Enroll:31 Compl:29	NA	13.80%	85.4 ± 7.2 (72-100)	Both nurse observations and actigraphy recordings showed disturbed nocturnal sleep, with the majority of patients having sleep efficiencies < 85%	Elderly, long-term nursing home residents, most with dementia	Cambridge Neurotechnology-actiwatch	Start:NS End:NS Durat:14 days	NS	NS	Caregiver report	Both measures showed disturbed nocturnal sleep. Nursing staff observations of sleep onset latency and early morning awakenings were consistent with actigraph. Actigraphy recordings showed more nocturnal awakenings than nurse observations
{Fetveit, 2003 #1355}	3	This study evaluates the effects of bright light therapy in demented nursing home patients with sleep disturbances. Open, nonrandomized study where participants served as their own controls.	Enroll:18 Compl:11	ns	9%	86.1± 8.9 (71-101)	Sleep improved substantially with bright light exposure (in 6 out of 7 actigraphically measured sleep parameters). Waking time within nighttime sleep was reduced by nearly 2 hours; sleep efficiency improved from 73% to 86% (p=.006); sleep onset latency was reduced by 1 hour.	Sleep disturbance defined as actigraphically measured SE<85%	Actiwatch (Cambridge)	Start: End: Durat: 3 2-week periods (baseline, pre-tx, tx)	Days 8-14 from pre-treatment period were compared with days 8-14 of the treatment period. Nurse staff observations used to help determine bedtime and uptime.	Actiwatch software	Caregiver report	Acti and nurse report both showed improvements in sleep in this pre-post intervention trial. 6 of 7 acti sleep parameters improved, including sleep efficiency, SOL, and total wake time. Bright light had significant effect on reduction of mesor (from 45.1 to 25.1; p=.0003); nonsignificant increase on the light/dark ratio (p=.097); and no significant change in acrophase.
{Fetveit, 2004 #1356}	4b	This study examined the longer-term effects of a two-week course of bright light therapy in demented nursing home patients with sleep disturbances. Open, nonrandomized study where participants served as their own controls.	Enroll:18 Compl:11	NS	9%	86.1± 8.9 (71-101)	During the 16-week post-treatment period, actigraphic measures gradually returned to pretreatment levels; after 16 weeks there were no significant differences from pretreatment for any variable	Sleep disturbance defined as actigraphically measured SE<85%	Actiwatch (Cambridge)	Start: End: Durat: Original study had 3 2-week periods (baseline, pretx, tx); this study ADDED 4 monthly post-treatment periods (each period = 7 consecutive days).	Days 8-14 from pre-treatment period were compared with days 8-14 of the treatment period. Nurse staff observations used to help determine bedtime and uptime.	Actigraphy Sleep Analysis 98, v4.13	Subjective Measures	Treatment improved acti measures of sleep efficiency, and reduced total wake time, SOL and early morning awakening. Bright light had significant effect on reduction of mesor (from 45.1 to 25.1; p=.0003); nonsignificant increase on the light/dark ratio (p=.097); and no significant change in acrophase.
{Fontana Gasio, 2003 #873}	4a	This study investigated whether low intensity dawn-dusk simulation (DDS), a "naturalistic" form of light therapy designed to embed sleep in its accustomed phase, could improve the disturbed circadian rest-activity cycle or nocturnal sleep in dementia. Design was a randomized trial	Intervention: DDS Enroll: Compl:9 7 pts dropped out, though group assignment not reported	Control: 'placebo' dim red light 4	8%	Int: 86.8 ± 4.8 Cntrl: 83 ± 5.2	While there were no differences between groups on clinical or cognitive status, nor on modification of circadian stability or amplitude characteristics of the rest-activity cycle, there were two sleep changes in the DDS group compared to dim red light group: 1) main sleep episode was 1:14h earlier during treatment (p=0.03) compared with before and after DDS and 2) actigraphy-measured sleep variables showed that the DDS group had shorted sleep latency, longer sleep duration, more nocturnal immobility, and less nocturnal activity than the dim red light group.	Dementia diagnosis (measured by MMSE) AND nurse-reported sleep disturbance	Actiwatch (Cambridge)	Start: End: Durat: 3 wks each during baseline, treatment, and follow-up	Missing activity or light data were replaced with the average of the mean of the 3 previous days at that time of the day	Actiwatch Sleep Analysis 98 v4.07	None	
{Gagnadoux, 2004 #732}	1	Study I Blinded comparison of TST estimated by PSG vs acti in pts with clinical suspicion of OSAs. Study II sought to compare the TST measured by actigraphy with CPAP use periods.	Enroll: I:24; II: 28 Compl:	I: NA II: NA	I: 63% II: 93%	I: 50±16 II: 56±11	II: Estimated sleep time under nCPAP was 82% (ranged 41%-100%); nCPAP adherence and estimated TST (ie, amount of sleep measured by actigraphy while CPAP was used) correlation = 0.80 (p<.001). Marked individual differences seen in CPAP use and sleep measured by actigraphy, with much sleep without CPAP and much CPAP use while awake.	SDB via PSG	Actiwatch	Start: I:BT; II End: I:UT; II: Durat: I:1night; II:	Default medium sensitivity; integrated activity count>=40 per epoch	Sleepwatch software (Cambridge Neurotech)	PSG (Study I)	Correlation of r=.90 b/w aTST (325 ±88) and pTST (328±82); 95% CI TST difference was 2.5 min (-73.1 to 78.1) b/w aTST and pTST, The diff b/w aTST and pTST exceeded 1 h in 3 patients
{Gay, 2004 #746}	3	To describe the sleep and fatigue patterns for both parents in late pregnancy and again in the early postpartum period using both objective (actigraphy) and subjective (logs, scales, questionnaires) measures to estimate sleep. The influence of work status and breastfeeding on new parents' sleep and fatigue was included.	Enroll: 154 (77 couples) Compl: 144 (72 couples)	NA	50%	32.1 +/- 5.1yrs (20-43yrs)-Moms 34.6 +/- 6.3yrs (22-53yrs)-Dads	Both moms and dads had comparable amounts of sleep during final mo of preganancy. However, from pregnancy to postpartum, moms lost an ave of 41.2-mins of nighttime sleep compared to only 15.8-mins for the dads. Sleep was more disrupted for both parents after birth, but moms were more affected by incr WASO during last mo of pregnancy and 1st mo postpartum. Both parents reported more sleep disturb and fatigue during the 1st mo postpartum compared to pregnancy.	New Parents	Actigraph (AMI)	Start: NS End: NS Durat: 48 hrs x 2	Action3 Software (AMI	4 autoscored outcome variables: TST-night; TST-day; TST-24 hrs; and WASO	48-hr Sleep Logs x2 time points Subjective Measures- Clinical Assessments, Questionnaires, Scales	Consistent results between GSDS and acti measures of sleep with a loss of sleep for both parents post-partum and a greater loss of sleep at night in mothers post--partum.
{Gnidovec, 2002 #638}	2	This study evaluated the validity of the Gachwiler actigraphy for assessment of sleep by comparing recordings with observations of 10 infants	Enroll:10 Compl:10	NA	60%	1, 3, and 6 months	See Actigraphy outcomes	NA	Gachwiler Actigraph, model Z80-32K (Gachwiler Electronics)	Start: End: Durat:72 hours each time	10 sec	Homegrown	Trained observer	1. Agreement between actigraphy and observation was 87% and 95% respectively at 3 and 6 months 2. Only 72% agreement between observers and actigraphy in month old infants
{Gossel-Symank, 2004 #835}	4b	To investigate whether diffs in activity-rest behavior observed in pre-term vs full-term (control) neonates continue to persist at the age of 20 mos.	Enroll: 17 Compl: 17	8 FULL TERM	53% - Pre-terms 38%-Full-terms	~20 mos w/ age correction for the pre-term infants	All infants exhibited a clear circadian activity-rest rhythm w/ a dominant per betw 23hrs32min and 24hrs23mins, but the pre-term infants had an incr variability in ultradian per lengths. Daytime nap/rest duration was sign shorter in pre-terms (1hr38mins) compared to full-term infants (2hrs18mins).	Pre-term vs Full-term infants at ~20-mos	Actiwatch (Cambridge, Neurotechnology, Ltd)	Start: NS End: NS Durat: ~10 days	Actiwatch Sleep Analysis 2001, ver 1.03 (Cambridge, Neurotechnology, Ltd)	Fast Fourier Transform(FFT) w/ a time series of 5.68 days; Sleep/Wake	Sleep Logs by parents	Pre-term infants had a shorter nocturnal sleep duration (9hrs55mins) compared to full-term infants (10hrs40mins). Moving time during sleep was elevated to 9.6% in pre-term infants compared to 7.5% in full-terms (p<.05)
{Grajewski, 2003 #1039}	3	An observational study of working flight attendants to determine whether they would be more likely than teachers (control group) to experience circadian disruption as measured by overnight melatonin production and to identify metrics of circadian disruption for large epidemiologic field studies in which biomonitoring would not be feasible.	Enroll: 45- flight attendants Compl: 63 (of the entire group of 71)	26 teachers	NA	36 +/- 4.7 yrs-Flight attendants 37.4 +/-5.9 yrs –Teachers	Flight attendants experienced incr circadian disruption as measured by a higher adjusted melatonin rate variance compared to teachers (p=.04). Time zones crossed corr w/ melatonin production and measures of sleep displacement.	Jet Lag in Flight attendants	Mini Motionlogger (AMI)	Start: NS End: NS Durat: 1 "menstrual cycle"	Action3 (AMI)	Cosinor analysis; Cole et al, 1992, Sleep, 15:461-9, modified for 3-min epochs; Corr analysis, exploratory principle components and factor analysis	24-hr Actigraphy Urinary Melatonin – 6-sulfatoxymelatonin (6SMT) Sleep Logs Subjective Measures – Flight hist records for 4 mos, Questionnaire covering 6 mos of travel hist for teachers	Comparison to reference standard Actigraphy and diary data were used to calculate the mean hourly rate of overnight 6SMT production. The number of time zones crossed was a useful indicator of both circadian sleep displacement and melatonin desynchronization. Transmeridian travel corr w/ variable shifts in the sleep- and worktimes of flight attendants w/ more sleep in the primary sleep period of the day. Incr Sleep Eff% corr w/ low melatonin.
{Greco, 2004 #731}	5b	The objective of this study was to examine the association between psychoactive medications and sleep quality in a sample of nursing home patients. Baseline data from a larger clinical trial of a nonpharmacologic sleep intervention were examined.	Enroll:210 Compl:168 Prescribed 1 or more psychoactive medications=109 (Grp1)	Not prescribed psychoactive medication = 59 (Grp2)	Grp1=21 % Grp2=20 %	Grp1= 83.1 ± 8.6 Grp2= 85.4+8	65% of the patients were taking one or more psychoactive medications routinely. The number of minutes of sleep, percent of time in bed asleep and number of awakenings did not differ between those receiving and not receiving psychoactive medications. Significantly better sleep quality was not found in those using antidepressants, or those who were using psychoactive medications reported to cause sedation.	"Frail" nursing home patients, defined as "inability to transfer out of bed at night without human assistance."	Actillume (AMI)	Start:1900 End:0700 Durat: 3-5 nights (12h/nt)	Though actigraphs were worn from 1900-0700, analyses based on 2100-0700. Sbjs with fewer than 3 nights data not included (so 20% of enrolled patients did not have 3 or more valid actigraphy nigths	Action3 - SUMACT	None	Actigraphy was the sole measure of sleep quality in this descriptive study. No relation between psychoactive medications and sleep quality was observed.
{Guilleminault, 2002 #803}	3	Random stratification of insomniacs w/ UARS and insomniacs w/ normal breathing into 4 tx groups for 6-mos to determine whether UARS in postmenopausal insomnia is a primary factor in the complaint and whether tx of this mild SDB is enough to improve the insomnia over and above a Behavioral Tx Program.	Enroll: 130 (68 Insom w/ normal breathing; 62 Insom w/ UARS) Compl: 126	34 Insom w/ normal breathing were randomly assigned to the Delayed Behavioral tx cond as the Tx Control (got a booklet on Sleep Hygiene rxs)	0%	50-70 Years	Abnormal breathing during sleep significantly intensified complaints of daytime fatigue (but not insomnia), and this complaint improved w/ SDB tx compared to tx with a behavioral /cognitive regimen. However, the Behavioral tx program produced the best response in insomniacs w/out SDB and shortened sleep latency even in the SDB patients	Post-menopausal Insomniacs w/ Normal Breathing Post-menopausal Insomniacs w/ UARS	NS	Start: NS End: NS Durat: 7-days Baseline; 7-days at 6-mo f/u post tx	Commercially available software from Mini	Custom – based on prior clinical experience and simultaneous, Act and PSG monitoring	PSG Sleep Logs Subjective Measures ENT evaluation	There were no diffs in the duration of noct awakenings across the 4 tx groups at Base. All 4 tx groups (incl the Delayed Behav tx control) had higher TST's at the 6-mo f/u compared to Base. The CPAP treated subgroup had the least improve in TST. The nose/surg treated subgroup had the largest decr in short arousals across the night w/ a similar decr for the SDB-treated group as a whole. Improvements in acti measures associated w/decreased daytime fatigue.

{Guilleminault, 2002 #804}	4b	Survey to determine the incidence, type and severity of sleep disordered breathing (SDB) and upper airway anatomy in a cohort of post-menopausal women with chronic poor sleep for >6 mos.	Enroll: 503 Compl: 394	NA	0%	55-70 years	Out of 394 postmenopausal women with chronic Insomnia, 264 (67%) had an AHI =/> 5, with 164 picked up during home monitoring, and an extra 100 diagnosed by PSG. Another 62 (15.7%) were diagnosed with UARS. Women with an AHI=/> 5, were more likely to have a hx of childhood asthma, upper airway allergies, wisdom teeth extraction <30 yrs old, and a hx of brusism.	Post-menopausal women with chronic Insomnia	NS-?Actiwatch	Start: NS End: NS Durat: "7 days" (unclear if these were 24-hr recordings or just nights) Edentrace on 7th night	Commercially available software from Mini	Custom - based on prior clinical experience and simultaneous, Act and PSG monitoring.	PSG	**Comparison to reference standard** Ambulatory (Actigraphy) without EEG missed 100 out of 394 women (25.4%) w/ AHI =/> 5 and could not recognize UARS. Most of the missed cases had a low AHI w/ a predominance of hypops. All women had a Sleep Latency =/> 30 mins and an awakening of 20 mins on at least 1, out of 7, nights of Actigraphy.
{Guilleminault, 2002 #814}	5	A description of 11 separate, case reports of atypical sexual behavior during sleep and the battery of procedures utilized to diagnose and treat them.	Enroll: 11 Compl: 9 had Actigraphy	NA	64%	18-38 yrs	All patients had a sleep disorder. No sexual assault was seen in the lab PSG. A combination of specific treatment for the parasomnia documented during testing and any co-morbid, psychiatric disorder led to control of the reported behavior in 10 of 11 patients, with tx control still present up to 5 yrs later.	Parasomnia: Atypical Sexual Behavior in Sleep	"Actigraphy" (Mini)	Start: NS End: NS Durat: 7-days (?repeated in some of the cases but NS)	Commercially Available software from Mini	Activity vs. Non-activity	PSG Sleep Logs Subjective Measures –structured interviews, questionnaires Clinical evals MSLT	Not adequately compared to any reference "Actigraphy is helpful only to document the frequency of nocturnal activity and its timing of occurrence on a 15-day or 3-week period," p335
{Harper, 2001 #1278}	3	The goal of this study was to compare circadian activity and temperature rhythms in patients with AD, patients with frontotemporal dementia or Lewy body disease, and controls.	Enroll: Compl:38	8	100% in both groups	Int: 70.2 ± 1.0 Cntrl: 72.8 ± 2.1	Alzheimer patients showed increased nocturnal activity and a significant phase-delay in their rhythms of core-body temperature and activity compared with patients with FTD and controls. The activity rhythm of FTD patients was highly fragmented and phase-advanced in comparison with controls and apparently uncoupled from the rhythm of core-body temperature.	Probable Alzheimer's Disease per NINCDS-ADRDA criteria	AM-16 activity monitor (AMI, Ardsley, NY)	Start: noon End: Durat:72hrs	Interdaily stability, a periodogram-based algorithm measuring day-to-day stability of the rhythm, and intradaily variability, a measurement of the fragmentation of the activity rhythm that assesses the period-to-period variability of the rhythm, were used as nonparametric measures of the circadian rhythm of motor activity Cosinor analysis used to model circadian rhythm	Oddly, the software not specified	None	Interdaily stability was lower in both patient groups that in controls. In patients w/AD, both circadian activity and temperature rhythms were delayed relative to controls. However, in patients with FTD, the activity rhythm was fragmented and phase advanced.
{Harrison, 2004 #1019}	3	To determine the relationship between light exposure, 24-hour sleep patterns and crying in healthy infants.	Enroll: Compl:56	NA	46.40%	Infants studied at 6, 9, and 12 weeks of age	Daytime sleep decreased with age and nighttime sleep increased with age	Healthy infants	Actiwatch (Cambridge Neurotechnology)	Start: 2400 Monday night End:2400 Thursday night Durat:72 hrs	NS	NS	Sleep Diary	Overall consistency between acti measures and parental reports of sleep. Reported sleep during the night increased with age, activity levels decreased during the night with increasing age. Activity levels at night and parental reports of good and poor sleepers were also consistent.
{Harvey, 2005 #709}	3	To investigate sleep-related functioning and the sleep-wake cycle during a euthymic period in Bipolar I patients compared to patients with primary insomnia and normal sleepers.	Enroll: 40 (20 Bipolar; 20 Primary Insomnia) Compl: 34 (14 Bipolar; 20 Primary Insomnia)	20 Normal Sleepers	50%-Bipolar 45%-Insomnia 35% _ Normals	39.6 +/- 15.2 yrs Bipolar 39.6 +/- 10.6 ys-Insomnia 35 +/- 13.4 yrs-Normals	70% of the euthymic, Bipolar patients had a clinically sign sleep disturbance; 55% met full dx criteria for primary insomnia (excluding the psych dx). The Bipolar group had higher levels of anxiety/fear around poor sleep and lower daytime activity compared to the other groups. Poorer sleep effic, a tendency to misperceive sleep, and dysfunctional beliefs about sleep, were comparable to the Insomnia group.	Insomnia Bipolar I	Actigraph (AMI)	Start: NS End: NS Durat: 8 days/nights	AMI software	Actigraph's Zero-Crossing Mode	Sleep Logs Subjective Measures	The sleep quality of the bipolar group was in between the insomnia and normal sleeper groups for all measures. Subjective sleep measures of SOL and WASO were greater and TST was lower than actigraphic estimates of sleep for both insom and bipolar groups.
{Hatfield, 2004 #751}	4b	This study sought to assess the impact of Alzheimers dementia on activity/rest cycles in home-dwelling pts at early stages of disease progression.	Enroll: 27 Compl:	19	Cntrl:53% Int:56%	Cntrl: 71.8 Int: 68.5	Increasing severity of dementia was associated with progressive disorganization and decreasing amplitude of the daily pattern of activity and rest within home-dwelling Alz disease subjects.	Alz dementia per DSM-IV and probably Alz disease per NINCDS-ADRDA criteria	Actiwatch (Cambridge Neurotechnology)	Start:ns End:ns Durat:28dys	Non-parametric circadian rhythm analysis (NPCRA)	Clocklab software (Actmetrix, Evanston, IL)	None	NPCRA showed that the stability, consolidation, and peak/trough changes of activity in the mildly demented patients were indistinguishable from controls, and that the moderately demented pts showed marked perturbations with significantly lower stability, consolidation, and peak-trough differences.
{Hedner, 2004 #636}	1	The study sought to examine a novel automated algorithm developed for actigraphic studies of normals compared to sleep apnea patients.	Enroll: Compl:228	NS	71%	Normals: 38.6+/-15.5 All (normals + all SDB levels): 48.8+/-14	The actigraphy algorithm evaluated in this study provides a reasonably accurate estimation of sleep and wakefulness both in normals and patients with SDB when compared to PSG on an epoch-by-epoch basis.	SDB based on full PSG	Watch_Pat100 system (Itamar Medical, Caesarea, Israel) Actigraphy module embedded is from AMI	Start: ns End: ns Durat: 1 night	See pg 1562 for full details: very specific automated sleep/wake analysis program, which for this study was synchronized with PSG	Watch_Pat100 (ASWA software)	PSG	Across all subjects, sensitivity was 88.8%, specificity was 69.5%, and agreement was 84%. Sensitivity and agreement tended to go down with increasing SDB levels (from 91% to 85%, and 86% to 79%, respectively). Specificity was less affected by increasing SDB levels (ranged between 68% and 71%).
{Hilliker, 1992 #1354}	3	Counterbalanced, cross-over, double-blind study to examine the effect of triazolam/placebo on a simulated night shift schedule. Two tours of 5 nights in the lab (1 w/ triazolam and 1 w/placebo). Only the placebo tour data in response to morningness (MT) vs. eveningness (non-MT) tendency is reported in this paper.	Normal Ss, not patients Enroll: 15 Compl: 15 (7-MT's and 8-non-MT's)	NA	27%	Mean=41 yrs (32-53 yrs)	MT types were sleepier than non-MT types for most of the night shift. The degree of physiol sleepiness was severe with a mean MSLT Lat of <5mins from 0230 to 0630 hours for the MT group compared to >9mins until 0430 hours for the non-MT group. Neither group showed adaptation to either physiol or subj sleepiness across the 5 nights of study.	Simulated Night Shift in Normal Ss	Actigraph (AMI	Start: NS End: NS Durat: 4 days (unclear if these were 24-hr periods or just day sleep periods)	AMI softwar	Custom-prev publ in SLEEP(1991);14:1 40-6. Sleep=1st of 3 consec epochs of counts =/< 20; Wake>20 counts	PSG screening Sleep Logs Actigraphy Subjective Measures MSLT Repeated Test of Sustained Wakefulness	The mean, estimated sleep duration for the MT group (312.7 mins) was not sign different from that of the non-MT group (325.7 mins) by actigraphy. Concurrent sleep log estimates of sleep duration were much lower in the MT group (255.7 mins) compared to 342.5 mins for the non-MT group.
{Hoekert, 2006 #1360}	2	Study is designed to determine if the Circadian Sleep Inventory for Normal and Pathological States (CSINAPS) is accurate for assessing the sleep/wake rhythm of elderly nursing home residents	Enroll:78 Compl:78	NA	6.40%	85 ± 6 (70-97)	Correlations between actigraphy and the CSINAPS (both items and subscales) are moderate at best, suggesting combining the use of both measures.	All but 3 of participants had a dx of dementia	Cambridge Neurotechnology, Actiwatch	Start:NS End:NS Durat:2 weeks	Sleepwatch Analysis System (Cambridge Neurotechnology)	NS	Circadian sleep inventory for normal and pathological states (CSINAPS)	Strong relationship between CSINAPS scores for bed time and get up time and actigraphy, but only moderate agreement for total sleep time. CSINAPS overestimated sleep time by 30 minutes relative to actigraphy.
{Korszun, 2002 #807}	4b	To determine if nocturnal sleep and daytime activity leve were different in patients with fibromyalgia, fibromyalgia and co-morbid depression, or depression compared to healthy controls	Enroll:59 Compl:59	28	16.90%	Fibromyagia 49.2 ± 2.2 Fibromyalgia plus depression 48.2 ± 2.4 Depression 45.8 ± 2.7 Controls 53.4 ± 2.4	1. Fibromyalgia patients showed some increased movement at night and disturbed sleep but no decrease in sleep efficiency, or increase in daytime napping. 2. Fibromyalgia patients with depression had more disturbed sleep, and more daytime napping than controls and other fibromyalgia patients.	Fibromyalgia (n=16) Fibromyalgia with co-morbid depression (n=6) Recurrent depression (n=9)	Am Mini-motion logger	Start:NS End:NS Durat:5-7 days	Action-W software using Cole Kripke Algorithms to define sleep		Healthy Control	Actigraphy was effective at demonstrating differences in movement at night, daytime activity, and daytime napping between the conditions in this pilot study.
{Korte, 2001 #1140}	4b	To determine w/ continuous activity monitoring whether pre-term neonates are adapting to the day-night cycle in the 1st week of life and approaching the acitivity-rest patterns of a full-term control group.	Enroll: 10 Compl: 10	10 full term	70% - pre-terms 40% - full-terms	34th –36th week of gestation – pre-terms 37th-42nd week of gestation –	Avg sleep time in pre-term infants was 9hrs1min at night and 8hrs54min during the day, w/ avg nightly sleep incr from 4th to 8th days of life (p<.05), exceeding day sleep time from day 6 onward. Total sleep time across 24-hrs was not diff betw groups. Pre-terms ate less (8.2 times/24-hrs) than full-terms (9.8 times/24hrs), w/ longer intervals betw feedings (2-4hrs) compared to full-terms (1-4hrs) but may have reflected diffs in environment conds.	Pre-term vs Full-term Neonates (1st week of life	Actiwatch (Cambridge Neurotechnology, Ltd)	Start: 3rd day of life for pre-terms;4th,5th or 7th day after birth for full-terms End: 8 days after start for all infants	Rhythmwatch and Sleepwatch software (Cambridge Neurotech, Ltd); Daytime=07:00-19:00;Nighttime= 19:00-07:00	Fast Fourier Transform(FFT) w/ a time series of 5.68 days; Wulff and Siegmund, 2000, Biol Rhythm	Sleep Logs by parents	Circadian Amplitudes (in the freq spectra) were present in 7, of 10, of the full-terms in the 1st week of life compared to only 1 pre-term.

{Korte, 2004 #741}	3	24-hr actigraphy was used to determine the effects of 3 diff Modes of Delivery on the activity-rest cycle and sleep parameters (day sleep, night sleep, and sleep across 24-hrs) in the 1st week of life.	Enroll: 59 Compl: 57	NA	55%-Vaginal 56%-planned C-section 58% - Required C-section	(37th-42nd week of gestation) Medians= 39.5weeks-Vag; 39weeks-planned C-sect; 40weeks-Required C-sect	All neonates had several short rest phases and short activity phases during a 24-hr day. 83% of vaginally born neonates had a distinct circadian freq in their spectra compared to 55% of planned C-sects and 50% of the medically required C-sects. These diffs might reflect diff environmental conds, e.g. more immediate social interaction from the vaginal delivery moms vs the C-sect recovering moms. 24-hr actigraphy provides a useful tool for looking at the ontogeny of the activity-rest rhythms in neonates and infants.	Planned C-section; Medically Required C-section after start of Labor; or Vaginal Delivery	Actiwatch (Cambridge Neurotechnology, Ltd)	Start: 3-rd4th day of life End: 8th –9th day of life Durat: 6-days	Rhythmwatch and Actiwatch Sleep Analysis Software (Cambridge Neurotech, Ltd)	Fast Fourier Transform (FFT) w/ a time series of 5.68 days (Wulff and Siegmund, 2000, Biol Rhythm Res, 31(5):581-602)	24-hr Actigraphy Sleep Logs by parents	Blind, prospective comparison to reference standard In all 3 groups of neonates, the ave nighttime sleep was sign higher than the ave daytime sleep from the 3rd to 8th days of life (p<.001). Vaginally born and medically required C-sect neonates had sign more sleep bouts during the daytime from the 3rd to 8th days of life compared to the planned C-sect neonates (p<.05). There were no 24-hr diffs betw groups in sleep parameters.
{Kripke, 2005 #681}	3	An attempt to replicate an earlier study by these authors of aberrant circadian phases in the aMT6s of seniors. An intentionally biased, sample of seniors w/ symptoms of either a sleep phase advance or delay were recruited for an ultra-short sleep-wake cycle protocol in the lab. A younger adult (control) group w/ no sleep disturbance was included.	Enroll: 62 Compl: 62 (20 seniors repeated the study 5-mos later for test-retest reliability)	25	Sex NS	69.3 +/-6.6 yrs (58-84 yrs)-Seniors 27 +/- 6.3 yrs (19-40 yrs)-Younger Adult Contrs	Failure to replicate previous findings. Not a single instance of aberrant circadian phase in salivary melatonin, urinary aMT6s excretion, oral temp, or cortisol excretion, was found in the seniors. Urinary aMT6s excretion was the most reliable circadian phase marker w/ high repeatability on retest (r=0.95;p<.001, N=18).	Seniors biased towards symptoms of ASPS/DSPS vs young-middle aged Adults w/ no sleep complaints	Actillume I (AMI)	Start: NS End: NS Durat: 10-11 days (1-week home baseline; 75-96 hrs in lab)	NS	Custom- Sleep hand edited w/ sleep logs and validated algorithm (Jean-Louis et al, 2000, Physiol Behav, 68:347-352)	Actigraphy Sleep Logs Saliva and Urinary Melatonin Urinary free cortisol Oral Temps Subjective Measures	Actigraphic results were similar to sleep log data; age-related difference in sleep time; seniors slept 26.6% out of 24-hrs compared to 35.4% for younger adults p<.001). Acrophases of actigraphic sleep were earlier in seniors compared to younger adults (p<.001), despite no diff in 24-hr light input betw groups. Bedtime and wake time were significantly earlier than in young subjects. Cortisol was the only phase marker to show significant differences between groups. Repeatability of home sleep times (in those seniors studied twice) was high (r=0.87; p<.001 , N=16). The acrophase of Home sleep was significantly correlated with the acrophase of phase markers in the lab.
{Lamond, 2005 #909}	3	To assess the impact of relay work on sleep quantity and whether train drivers are able to obtain quality sleep in relay vans during a short (<48-hrs) relay trip.	Enroll: 14 Compl: 14	NA	100%`	46.6 +/- 4.9 yrs	Although train drivers on relay trips are able to obtain sleep during short relay operations, the sleep duration is ~half of what is obtained at home and of poor subj quality. In addition, the timing of the sleep opportunities directly impacts the quantity, efficiency, and subj quality, of the sleep obtained.	Shift Work (Relay Train Drivers)	"Activity monitor" (Gaehwiler Electronic, Hombrechtikon, Switzerland)	Start: NS End: NS Durat: ~5 days (3 days Baseline at home then <48-hrs relay trip)	Actiware-sleep Software (Cambridge Neurotechnology Ltd) paired w/ sleep logs for LO and Wake-up Times	TST, SO Lat, Sleep Eff%, subj ratings of sleep quality and sleepiness before/after each sleep per	Sleep Logs Subjective Measures	Blind, prospective comparison to reference standard Train drivers obtained an ave of only 4-hrs sleep/opportunity during the relay trip compared to 7.8 hrs of sleep/night at home (p=.0001), and TST/24-hr per averaged 5.8 hrs (+/- 1.3hrs). Sleep in the relay van was assoc w/ longer SO Lats (p=.001), lower Sleep Eff% (p=.0001), and poorer subj quality (p=.0001) compared to home sleep. Eve (2000hrs) sleep opportunities in the relay van were assoc w/ the most sleep (4.6 hrs) compared to 3.6 hrs for either AM (0400hrs) or Day (1200hrs), although SO Lat was shortest and Slee.p Eff% highest during the Day opportunity
{Larkin, 2005 #695}	4b	Goal of study was to quantify the associations of SDB, sleep duration, and c-reactive protein levels in adolescents	Enroll:143 Compl: all 143 completed study, but actigraphy data missing in 6 pts	NS	50%	13.8± 0.8	Adjusted mean CRP levels showed a dose-response relationship with SDB above threshold of AHI>5, an association that was partially explained by overnight hypoxemia, and less so by average sleep duration.	PSG confirmed SDB dx in adolescents	Octogonal Sleep Watch 2.01; AMI	Start: ns End: ns Durat: 1wk (min 4 days)	Used "time above threshold data model"	Action-W	None	Sleep duration (assumed to be from actigraphy – see NOTES significantly negatively correlated with c-reactive protein levels, BMI and AHI. Sleep duration significantly associated with CRP in models adjusted for age, sex, BMI percentile, and (BMI percentile)2
{Leger, 2002 #1353}	3	To use PSG and actigraphy to evaluate the sleep patterns in Blind Ss living under normal social conditions, w/ free-running sleep/wake cycles and complaints of abnormal sleep/ daytime sleepiness. Sleep comparisons to sighted controls were included.	Enroll: 26 Compl: 24	24 - Normal Sighted; age and sex matched to blind P's	73%-Blind 79% - Sighted	44.3 +/- 12.1 yrs (26-67 yrs) – Blind Age matched Contrs (no contr for 2 Blind females –ages 61 and 67)	Blind S's were "free-running" despite normal and regular social interaction. They had lower TST with a Sleep Lat that was twice as long, and a reduced Sleep Eff% compared to age and sex paired sighted contrs. REM Lat was longer w/ a reduced REM% in the Blind S's. Cyclic sleep/wake probs w/ insomnia or EDS were found in 6 Blind S's. No corr was found betw the type of blindness or presence of prosthetic eyes and the different noct sleep and "free-running" pattern results.	Blind Subjects Sighted Contrs	Z80-32K V1 (Gaehviler Electronic, France)	Start: Time-synched w/ the 1 PSG per S in lab End: NS Durat: 15-days	NS	NS	PSG Sleep Logs Subjective Measures	Free-running subjects with sleep episodes at night showed decrements in sleep quality relative to controls. Direct comparison of PSG and Actigraphy for 1 night showed no difference in TST. However Sleep Eff% was higher by Act than PSG. Over the 14 days of the study daytime naps and sleep episodes were frequent by acti in the Blind S's. PSQI showed poor sleep quality in the prior month.
{Lichstein, 2006 #1362}	1	A validation study of 1-night of Actigraphy to PSG "gold standard," and a sleep diary, in a random cohort of volunteers who met "conservative criteria for insomnia" and completed home sleep diaries (2-weeks).	Enroll: 68 Compl: 57	NA	46%	21-87 yrs Age stratified: 21-39=8 S's; 40-59=22 S's; 60-87=27 S's	Actigraphy estimates of WASO, TST, and Sleep Eff% were not sign diff from PSG. By contrast, Sleep Onset Lat and # of noct awakenings were sign diff betw Act and PSG. Neither Age, nor sex affected the diffs betw Act and PSG. To test for low power, a series of post-hoc power analyses were performed and confirmed that the study was large enough to detect medium-sized (d=0.5) diffs but not small diffs (d<0.4) among the 3 instruments: PSG, Act, and Diary, for the 5 sleep variables of interest.	Insomnia	AW64 Actiwatch (Mini)	Start: 9pm synced w/ PSG computer clock End: NS Durat: 1 Night	Actiware Sleep v. 3.3 (Mini)	High Sens=Activity count of 20 <20=Sleep w/ weighting of adjacent epochs; =/> 20=Wake	PSG Sleep Logs Subjective Measures	Actigraphy measured WASO, TST, Sleep Eff%, and # of noct awakenings w/ an acceptable degree of accuracy for clin eval of insomnia, but correlations were lower than from validation studies in normal controls. Actigraphy underestimated Sleep Lat compared to PSG. There was a mild to moderate bias for actigraphy to overestimate TST and sleep efficiency, but this was not uniform across the range of values. Actigraphy approxs to PSG were superior to Sleep Diary.
{Lotjonen, 2003 #781}	1	To determine the reliability of Wrist Care in recording sleep-wake patterns of adults of various ages	Enroll:32 Compl:32	NA	25%	62 (26-89)	Both instruments were reliable for recording sleep and waking states.	Healthy controls	Actiwatch (actigraphy) and Wrist Care	Start: End: Durat:	Data from actigraphy and Wrist Care compared to PSG (1 night), Daytime activity compared using Actigraphy and Wrist Care	1) Method proposed by Jean-Louis et al and 2) Sadeh et al for scoring actigraphy and wrist care data	PSG Algorithms/Devices	1) Wrist Care and actigraphy had about 80% agreement w/ PSG regarding sleep/wake states 2) When compared w/diaries, had 87% agreement regarding naps 3) Both wrist care and actigraphy appeared to overestimate sleep time by 30-70 min
{Martin, 2005 #703}	5a	Evaluation of SDB in nursing home residents using actigraphy and pulse oximetry	Enroll:109 Compl: 109 was total sample, but only 71 had "acceptable actigraphy		26%	86.2+/-9.2	40% of nursing home residents with daytime sleepiness and night time sleep disruption had abnormal ODI. Of all observational variables assessed, only loud breathing during sleep was significantly correlated with ODI (r¼.284; p¼.003). When ODI was adjusted for estimated total sleep time, higher adjusted ODI was associated with higher body mass index (kg/m2).	Suspected SDB	Mini-motionlogger (AMI	Start: ns End:ns Durat: 1 night		ActionW	Subjective Measures	Acti used only to determine TST. TST = 4.3 ± 2.1; %sleep (TST/total monitoring time) = 47.9% ± 25.4; #wakenings=18.2 ± 8.4
{Martin, 2006 #1361}	5b	This study is a secondary analysis of data collected during a trial of non-pharmacological measures to improve sleep. Questions addressed in this study included the relationship of daytime sleep to nocturnal sleep problems, a determination if clinical characteristics e.g., cognitive function would distinguish residents with sleep distruptions from those with such problems, and a determination if circadian rhythms were more disrupted in subjects with more daytime sleep and disrupted	Enroll:492 Compl:492	NA	19.60%	NS	1. 69% of the residents had daytime sleep episodes (were observed sleeping >15% of the time 2. Daytime sleepiness associated with decreased cognitive function more medical co-morbidly, greater impairment, and more time in bed 3. No significant differences between those with night sleep disturbances and those without nighttime sleep disturbances 4. Less robust circadian rhythms were associated with more daytime sleep	Of 184 whose charts were reviewed, 42% had a documented dx of dementia and 36% had a dx of depression	Am, Mini-motionlogger, and sometimes Actilume (if circadian rhythms studies)	Start: 2200 End:0600 (for night time recordings) Durat: 194 pts wore wrist actigraphy for 2 nights, 118 of the 194 pts (60.8%), wore a wrist actigraph for 72 hrs	Action 3 software	Circadian rhythms were modeled using a 5 parameter extension of traditional cosigner analysis	Subjective Measures	1.Resident slept on average only 60% of the time between 10 pm and 6 am, with 72% of those assessed (n=194) having nocturnal sleep disturbances 2. 97% percent of pts assessed (n=118) had abnormal circadian rhythms
{Matsumoto, 1998 #1170}	2	This study compared PSG and actigraphy recordings using Action 3 sleep/wake scoring algorithm and different settings of the scoring factor in low and high efficiency sleepers. Epochs were scored as "true sleep" or "true wake".	Enroll:15 Compl:15	NA	13.30%	Shift workers 45.8 ± 9.0 Healthy volunteers 26.8 ±4.9	An algorithm with a weight of P=0.14 was most accurate in both high SE index and low SE index groups	Shiftworkers (n=10) Volunteers (n=5)	Actilume-AM	Start: End: Durat:2 nocturnal recording and 2 daytime recordings	Action 3 software (vers 3.15)	Weighted algorithms were then developed with various weights ranging from 0.1-0.5	PSG	There was significant variation in scoring accuracy in the high SE group. The setting of 0.14 was the best setting, with 92% agreement for true sleep and true wake. The setting has less of an effect in the low sleep efficiency group, and the setting of 0.14 resulted in 81% agreement.

{McCrae, 2005 #689}	3	Community Seniors were stratified into 4 groups by subj reports of wake time during the night w/ or w/out complaints about sleep (Good or Poor Sleepers, Complaints, No Complaints) in a study to identify the sleep, health, psychological, and daytime functioning factors that would differentiate these 4 groups. Used both subjective and objective measures of sleep. Gender diffs were also considered.	Enroll: 116 Compl: 103 (Complete Actigraph data on 102)	NA	35%-GS/NC 50%-GS/C 37.5%-PS/NC 37%-PS/C	72.8 +/- 7.1 yrs (all 4 subgroups were comparable in Age)	Only health differentiated groups – complainers – across both categories of sleepers. Both poor and good sleepers who complained about their sleep reported 1-2 more chronic conds compared to NC. C/good sleepers reported more daytime fatigue than NC/poor sleepers.	Seniors (60 yrs and older)	Actiwatch-L (Mini)	Start: NS End: NS Durat: 14-days	Actiware-Sleep vol 3.3 (Mini) - SOI/offset=1st and last 10-mins w/ no more than 1 epoch wake	High Sens=20 counts; Wake=/>20 counts/epoch; Sleep= <20 counts w/ weighting of adjacent 2-mins	Sleep Logs Subjective Measures	Actigraphic measures of sleep (e.g. latency, efficiency, total wake time) distinguished btween groups (NC/good sleepers and C/poor sleepers or NC/poor sleepers). NC/good sleeper and C/poor sleeper women slept more efficiently compared to their Male counterparts in these groups. Within-subject comparison between objective and subjective sleep measures showed high correlations for NC sleepers between actigraphy and sleep log estimates of TST (r≥ 0.80), and latency for NC/poor sleepers, but there were no significant correlations between the two measures in subjects who complained of poor sleep.
{McCurry, 2004 #927}	5a	A presentation of 3 selected, case studies from an ongoing study of sleep problems in community-dwelling Alzheimer's disease (AD) patients. The goal is to develop and then empirically evaluate an in-home, behavioral/education tx program (6 sessions over 2 mos) for community AD patients and their caregivers.	NA	NA	33% (1 of 3)	77 and 83 yrs	Clinical and empirical evidence that in-home, behavioral/sleep hygiene rxs to caregivers can be helpful in treating sleep and nighttime behaviors in community-dwelling AD patients. Quantifiable improvement by sleep diaries, actigraphy, rating scales, and clinical interviews, was verified.	Alzheimer's disease with at least 1 sleep prob and nighttime behav 3 or more times/week	Actillume (AMI)	Start: NS End: NS Durat: 1-week x 3 time pts (Baseline, 2-mos (post tx) , and 6-mo f/u)	Action3 Software (AMI)	NS	Sleep Logs Subjective Measures Behavioral In	**Pilot study** in 3 subjects Actigraphy at 2-mos, post the behavioral/education tx program documented sleep improvements confirmed by subj ratings and sleep diaries. The 6-mo actigraphy continued to confirm improve in 1 patient, 1 had deteriorated and 1 had died.
{McCurry, 2005 #902}	4b	To evaluate a sleep education program on improving sleep in dementia pts living at home with family caregivers	Enroll:14 Compl:11	17 15	Int:59% Cntrl: 53%	Int: 78, 8 Cntrl: 78, 7	Educational intervention showed greater reductions in nighttime awakenings, total awake time at night relative to controls at postintervention. At 6mo f/u, those differences remained, and int pts had fewer awakenings/hr and were awake for less time at each awakening.	Alzheimers (probably or possible) dx'ed by primary care MD	Actillume, AMI	Start:ns End:ns Durat:1wk	"maximum channel used to est daytime sleep b/c of increased sensitivity to movement decreased likelihood that pts sitting quietly awake during day would be recorded as sleep" ALL other actigraphy variables derived from sum activity channel.	Action 3	None	**Level 4** 1) Actigraphy outcomes were the primary study outcomes – see above. 2) Actigraphy also used to show that there were no sig differences b/w pt and caregiver on a) amount of daytime sleep, b) amount of daytime illumination & c) amt illum >1000lux (table 2)
{Middleton, 2002 #801}	3	To determine whether 2 lighting schedules – A: 12hrs at 200 lux/12hrs at <8 lux or B: 12hrs at 1000 lux/12hrs at <8 lux - can maintain circadian phase to a 24-hr day when neither sleep, nor activity are scheduled.	Normal S's Enroll: 12 (6–Schedule A; 6– Schedule B) Compl: 12	NA	100%	Schedule A S's: 21.5 +/- 4.2 yrs Schedule B S's: 24.3 +/- 1.6 yrs	On Light Schedule A (200 lux), 4, of 6, S's showed phase delays. On Schedule B (1000 lux), synchronization of the rest-activity cycle to 24 hrs was maintained but w a sign overall phase advance of 0.81 hrs in the rectal temp rhythm. Social interactions had no major effect on phase. Observations sugg that domestic intensity lighting requires scheduled sleep and activity to maintain circadian phase to a 24-hr day.	Healthy Normals	MiniMotionlogger (AMI)	Start: 8am End: NS Durat: 15 days – Schedule A 17-days – Schedule B	Action3 software (AMI) for all tagged "in bed" periods	Only cosinor data w/sign fits (p=/<0.05) and % rhythms >40% for Act	24-hr Actigraphy 24-hr Rectal Temp Urinary Melatonin Sleep Logs Activity Logs	Subjects living under a 200/8 lux L/D cycle showed significant delays in rhythms of activity, sleep, CBT and aMT6s over the 14 days with a calculated period of 24.21 (activity). Subjects living under a 1000/8 lux L/D cycle showed slight but significant advances in CBT and aMT6s, with a calculated period of 23.9 The calculated period of activity rhythms at 23.97 was not significantly different from 24 h.
{Mongrain, 2004 #1351}	2	To compare the phase angle (temporal relationship) between the sleep schedule and circadian phase of rectal temp min and DLMO in M-type and E-type Ss. Ss were free to adopt a spontaneous sleep schedule.	Enroll: 24 12-M-types; 12-E- types Compl: 24	NA	50% in each Group	(19-34 yrs) 24.7 +/- 1.5 yrs= M-types 23.4 +/- 0.7 yrs= E-Types	Phase angles were very similar in the 2 groups. However, a later circadian phase was assoc w/ a shorter phase angle. For the same morn-even score, women had an earlier DLMO and a longer phase angle betw DLMO and wake-time. Overlap in the circadian phases occurred across groups and phase angles were longer in E-types compared to M-types in these Ss. Where there was non-overlap in phase, phase angles were shorter in E-type Ss. Morn-even preference reflects to 2 diff mechanisms.	Normals: Morning-Type vs Evening-Type	Actiwatch-L (Mini)	Start: NS End: NS Durat: 8 days	NS	NS	PSG Sleep Logs 26-Hrs Rectal Temp Salivary Melatonin Subjective Measures	Earlier, estimated, mean bedtimes (~2.5hrs) and wake-times (~2.8hrs) occurred in M-types vs E-types. Both circad phase markers (DLMO and temp min) corr. w/ the timing of the sleep schedule (r ≥0.75).
{Monk, 2001 #1141}	3	This study evaluates the effect of a 90-minute afternoon nap on nocturnal sleep, circadian rhythms, and evening alertness and performance in healthy elderly persons. Studied both at home (Actigraphy) and in lab (PSG)	Enroll:9 Compl:9	NA	44.40%	78.6 years (74-87 years)	1. Nocturnal sleep was not adversely effected by longer afternoon nap (mean 58 minutes) in home environment, however in lab, statistically significant reduction in nocturnal sleep (48 minutes) 2. Also a small but statistically significant decrease in nocturnal sleep efficiency during nap condition in lab 3. Afternoon naps did not improve performance during evening or alter perceived alertness during evening	NA	NS	Start: End: Durat: 2 17-day periods (in home recordings)	NS	NS	PSG Sleep Logs Subjective Measures	Actigraphy and sleep logs showed a non-significant tendancy to decrease TST at night with daytime naps and a an increase in 24 h TST. Nocturnal TST was significantly lower by PSG. Sleep efficiency was slightly, but significantly, reduced as measured by PSG, but not by logs or actigraphy.
{Monk, 2003 #778}	1	This paper describes four studies evaluating the reliability and validity of a new questionnaire (Sleep Timing Questionnaire). Study 2 compared the STQ and actigraphy.	Enroll:257 Compl:257 Study 2:23	Study 4, 40	42%	Study 1 46.3 ±20.5 (20-82) Study 2 45.1 ±17.3 (23-76) Study 3 33.5 ±13.2 (20-59) Study 4 55.4 ±18.4 (20-89)	The STQ is both reliable and valid for determining when an individual usually sleeps	Study 4 included 19 pts with depression, 15 pts with insomnia, 5 with other sleep disorders, 3 with other illnesses and 12 people who were caregivers of pts	Study 2 MM Actiwatch	Start: End: Durat: ≥ 1 wk	Study 2 in=house software	NS	Sleep Logs Subjective Measures	There was a significantly positive relationship between STQ and acti measures of activity offset (r = 0.59) and activity onset (r = 0.77). Most of the variance could be attributed to 2 subjects.
{Montgomery-Downs, 2005 #690}	2	This prospective cross-sectional study tests the validity of actigraphy in making the diagnosis of PLMs in children	Enroll:118 Compl:99	NA	42%	7.8 ±2.2 (4-12)	Significant differences in number of movements according to diagnostic category	54% diagnosed with sleep disordered breathing, 38% primary snoring or normal PSG, and 15% with PLMD	Actiwatch-64 (MM)	Start: End: Durat:overnight	Actiwatch-PLMs software	Derived from ASDA criteria, w/ 2 sec assessment. Validated in adults but not children	PSG	1. Actigraphy over-estimated PLMs 2. Application of a correction factor improved accuracy, but different correction factors were required for each group and could not be applied accurately without knowing pt diagnosis
{Nelson, 2002 #793}	5b	To determine the effect of a verbal or image manipulation of a pre-sleep stressor (anticipated presentation the next day) on Sleep Onset Latency (diary and actigraphy) in patients w/ chronic insomnia.	Enroll: 59 Compl: 31 17-Verbal group 14-Image group	NA	45% overall 47%-Verbal 43%-Image	20.9 +/- 2.6 yrs –Verbal 19.8 +/- 1.9 yrs -Image	Ss/Ps who thought in images fell asleep faster and reported less anxiety and discomfort the following AM. Clinically, results argue for interventions that train SO -insomniacs to incr thinking in images and reduce verbal rumination after lights out.	Primary Chronic Sleep Onset Insomnia (DSM-IV)	Actiwatch (AMI)	Start: Bedtime End: Risetime Durat: 1 Night	Action-W Software (AMI)	NS	Actigraphy Sleep Logs Subjective Measures	Report was confined to Sleep Lat. Although the Actigraphy estimate of Sleep Lat was longer in the Verbal group compare to the image group, this diff did not reach stat sign. Only the Subj estimates of Sleep Lat were stat sign.
{Nelson, 2003 #784}	3	To compare the freq, emotional value, and content of spontaneous, pre-sleep mental imagery reported by chronic insomniacs vs good sleepers in the natural, home environment. And, to determine the effect of this pre-sleep imagery on Sleep Onset Latency as defined by diary and actigraphy.	Enroll: 28 Compl: 20	20	55% - whole group 45%-Insomniac	(18-36 yrs – whole group) 21.4 +/- 2.2 yrs-Insomniacs	Controlling for the longer Sleep Lat, the Insomnia group had a higher % of unpleasant images compared to good sleepers (p<.01). A positive corr betw unpleasant images and subjective Sleep Onset Lat (p<.05)was found for the Insomnia group, but not the good sleepers. The insomnia group experienced more images around intimate relationships and sleep (p<.05) and fewer random/un-connected topics (p<.01) compared to the good sleepers.	Primary Sleep Onset Insomnia vs Good Sleepers (DSM-IV dxes/co-morbidity were permitted in both	Mini-Motionlogger Actiwatch (AMI)	Start: NS End: NS Durat: 1-night	Action-W (AMI)	Zero-Crossing Mode	Actigraphy Sleep Logs Subjective Measures	Report was confined to Sleep Lat. Insomniacs had a sign longer subjective and objective SOL compared to the good sleepers (p<.001), so it became a covariate control factor for all imagery analyses.
{Nishihara, 2002 #669}	4b	This study evaluated the development of circadian rhythms in newborn Japanese infants by comparing sleep wake patterns of mothers and their babies at 3, 6, and 12 weeks of age	Enroll:11 pairs Compl:11 pairs	NA	36% of infants	Infants studied at 3, 6, 9 and 12 weeks after birth. Mothers 28.8 ± 2.6 years	1. Circadian rhythms of activity began developing as early as 3 weeks of age, clear 24 hour peak in activity had developed by 12 weeks of age	NA	Actiwatch (MM)	Start: End: Durat:3-5 days on 3 occasions	NS	NS	Sleep Logs	Detected the development of circadian sleep/wake rhythms from 3 to 12 weeks of age in infants and the association of infants sleep/wake rhythms with those of the mother.

{Noseda, 2002 #798}	5a	This study aimed to compare the effects of CPAP alone, CPAP+clonazepam, and clonazepam alone in patients with mild-moderate SAHS and high leg activity.	Enroll:14 Compl	NA	13/14= 93%	54±12	Design: Each of the 14 pts were recorded on 3 consecutive nights with CPAP, CPAP+clon, and clon, respectively.	SDB (AHI b/w 10 &50) and leg movmenet index based on time in bed of >15	NS	Start: NS End:NS Durat: 3 consec nights			None	Each of the 3 txs effective in reducing LMI based on TIB
{O'Reardon, 2004 #915}	1	Wrist actigraphy and daily diaries were used to compare the daily pattern and timing of food intake relative to sleep-wake profiles (sleep timing and continuity) in obese patients diagnosed with nocturnal eating syndrome (NES relative to a matched group of healthy, but obese, control Ss.	Enroll: 46 Compl: 46	43	30% -NES Ps 35% - Controls	43.3 +/- 9.8 yrs – NES Ps 39 +/- 11 yrs – Controls	There was no dif betw the total caloric intake of the NES vs control Ss, but the temporal pattern of caloric intake of the NES Ps was delayed relative to Controls. Food intake after the eve meal was incr by >3-fold in NES Ps compared to controls (p=.001). NES Ps consumed food during 74% of noct awakenings vs. 0% for the controls.	Obese Ps w/ Noctural Eating Syndrome vs Obese Controls	Actiwatch-L Mini-Logger Series (Mini)	Start: NS End: NS Durat: 10days/11 nights	Mini – but NS	Custom-Manually (blind to condition) matched to accompanying sleep logs for timing of sleep onset and offset, sleep period durat, and # of	Sleep Logs Mood Log Subjective Measures	Blind, prospective comparison to reference standard Good convergence of sleep diaries with actigraphy for both groups (r's =/> 0.85). Sleep onset, offset, and total sleep durat times were comparable between Ps and controls. NES Ps reported more noct awakenings compared to controls (p<.001) and their actigraphically estimated arousals occurred earlier during sleep (128 mins after SO) compared to controls (193 mins after SO, p=.01).
{Paavilainen, 2005 #702}	4a	The main goal of the study was to determine how activity (as measured by a telemetric actigraphy) differs between demented and non-demented nursing home residents, and to see actigraphy correlates with subjective sleep quality.	Enroll: Compl:23	19	NS	Exp: 84, 9.5 Cntrl81.5, 9	The demented pts had lower daytime activity and higher nocturnal activity than the non-demented pts.	Nursing home residency	Vivago (IST Oy, Helsinki, Finland)	Start: ns End: ns Durat: NH#1>10 days; NH#2 = 113 days [NOTE: For data analysis, only the first 10 complete	Analyzed in 3 periods that divided up a 24-hour period. Used a Poincare (return) plot analysis	NS	Subjective Measures	Significant differences in activity between demented and non-demented. Correlations between daily sleep-assessments and activity parameters were low, but statistically significant; for example, correlation coefficients between the night/day activity (mean) ratio and 1) quality of sleep and 2) daytime alertness were 0.27 and 0.24, respectively (both p<.001).
{Paavonen, 2002 #674}	2	This study compared the results of two different placements (waist and non-dominant wrist) of actigraphy recorders in primary aged schoolchildren	Enroll:20 Compl:20	NA	30%	10.5 years (7.3-13.3)	See Actigraphy outcomes	NA	Mini-motionlogers (AMI)	Start: End: Durat:72 hours	ACT2000 and AW2 software	Sadeh et al algorithm	Devices	1. Overall minute by minute scoring comparisons was 92.5% (range 82.3%-97.7%) 2. Correlation coefficients for sleep variables were all significant e.g., r=0.78-0.91
{Paavonen, 2003 #657}	4b	An open, clinical trial to determine whether melatonin is effective in treating sleep problems in children w/ Asperger disorder. To also assess whether amelioration of sleep disturbances improves behavior and well-being.	Enroll: 15 Compl: 15	NA	87%	6-17 yrs old	Sleep improvement during melatonin tx was assoc w/ improvement in behavioral and emotional parameters reported by parents and teachers. This tx effect was observed w/in a few days of initiation and disappeared soon after discontinuation.	Children w/ Asperger disorder (by DSM-IV)	Mini-MotionLogger (AMI)	Start: NS End: NS Durat: 48-72hrs x3 time pts	ACT2000 and AW2 Software (AMI)	TST, Sleep Eff%, SO Lat, #of awakenings (Sadeh et al, 1989, J Ambulatory Monitoring, 2:209-216).	24-hr Actigraphy Sleep Logs concurrent w/ actigraphy Subjective Measures	A decr in mean noct activity (p=.04) and SO Lat (p=.002) occurred during melatonin tx, although # of noct awakenings incr (p=.048). W/ tx discont, TST decr (p=.034), noct activity incr (p=.023) and sleep quality deteriorated (SO Lat incr; Sleep Eff% decr; p=.06). Lg individual variability in actigraphic sleep response
{Penzel, 2004 #725}	2	Investigation of a new ambulatory recording system that uses peripheral arterial tonometry (PAT), oximetry and actigraphy (Watch-PAT) to detect sleep apnea and arousals	Enroll:21 Compl:17	NA	NS	Only range reported: 30-69	Correlation b/w RDI derived from PSG and Watch-PAT system was 0.89 (no p-value reported, but authors state it is "significant" | Either 1) suspicion for SDB and referral for sleep study or 2) Pts diagnosed with SDB and on CPAP for at least 3 mos	Watch-PAT (Itamar Medical, Caesarea, Israel)	Start: NS End: NS Durat: 1 night		Proprietary to Watch-PAT.	PSG	No significant correlation between TST derived by PSG and by actigraphy. Bland-Altman shows much scatter, which the authors state " corresponds to a very limited confidence in the TST in these patients, as predicted by the Watch-PAT device." Mean of the differences in TST was 12.17 +/- 64.5 min
{Pillar, 2003 #761}	4b	This study sought to examine and validate the accuracy of the Watch_PAT 100 in the detection of arousals from sleep, as defined by AASM.	Enroll: 68 Compl:	[Note: 61 pts referred for SDB evaluation and 7 healthy volunteers	79%	46 +/- 14	Significant correlation coefficients between arousals scored from PSG and those derived from WP100 device (r=.87). [see more detail on outcomes below, under "Actigraphy Outcomes."]	SDB	Watch_PAT 100 (3 signals: actigraphy, PAT, oximetry)	Start: ns End: ns Durat: 1 night sleep in lab	"sleep/wake determined by actigraphy;" arousals scored automatically using an improvement of an algorithm previously described (see Pillar et al, 2003; Sleep)	Algorithm scores arousal if one of following conditions is fulfilled within an epoch of sleep: 1) association b/w 2 events (see text for more detail); 2) an association b/w PAT signal amplitude attenuation of more than 40% and short movements of the patient, detected by energy of the actigraphic signal.	PSG	Demonstrated ability to detect significant difference between groups or conditions in well-designed trial Sensitivity and specificity of PAT in detecting pts with at least 20 arousals/hr of sleep were .80 and .79, resp. Area under the ROC was .87
{Provini, 2005 #675}	3	Continuous actigraphy and sleep logs were used across a double-blind, crossover randomized study of the D3-receptor agonist, non-ergoline derivative, pramipexole, for the tx of SRED in 11 Pts presenting to a sleep clinic. A 2-week washout per occurred between drug and placebo conditions.	Enroll: 11 Compl: 11	NA	30%	49 +/- 16 yrs	Pramipexole was well tolerated w/out any patient w/drawing from the study. 9 of 11 Ps incr to max drug (0.36mg) or placebo (2 tabs) dose allowed. The median night-time activity decreased (p=.02) while the # of good sleep nights/week increased (p=.02) on pramipexole. No sign changes in body wt or in absolute disease severity occurred on drug or placebo.	Sleep-related Eating Disorder	Mini Motionlogger Actigraph Advanced (AMI)	Start: NS End: NS Durat: 4-6 weeks (not cont, 1week baseline, 2nd-3rd weeks on drug or	NS	NS	PSG Actigraphy Sleep Logs Subjective Measures Periodic blood, urine, ECG	Only the median noct activity was sign reduced on drug. The only subjective measure to be better on tx than placebo was the nights of good sleep/week.
{Regestein, 2004 #749}	1	To determine if self-reported sleep measured by the St. Mary's Hospital Sleep Questionnaire was related to objective sleep, cognitive performance, and motor performance	Enroll:88 Compl:88		0	45-66	1. Poor sleep quality was associated with increased risk of psychological and somatic symptoms, poorer cognitive function 2.Self reported low sleep quality showed little correlation with objective measures	Healthy women with hot flashes	MM, no specific type of actiwatch named	Start:NS End:NS Durat:7 days	Appears to be developed in house, references Webster, Kripke et al, 1982 and Cole et al, 1992 for description of method	NS	Sleep logs	There was a significant but small avg. difference between objective and subjective sleep quality (avg diff of 7.5 min). The variation was large, with a correlation of r = 0.31. Women who had self-reported sleep latencies longer than normal, over-estimated their sleep onset time by 30 minutes., Women who had shorter than average self-reported sleep latencies under-estimate their sleep latencies by 15 minutes.
{Richards, 2001 #1133}	4b	This was pilot study designed to test the effect of an individualized program of individualized activities designed to enhance sleep in cognitively impaired patients residing in a dementia care unit. Patients wore actigraphy for 3 consecutive days during baseline and 3 days during intervention to measure sleep wake patterns.	Enroll:7 Compl:5	NS	100%	76.2 ± 8.0 (70-89)	Results showed an increase in nocturnal sleep (327 ± 155 min to 354 ± 146 min) with increased efficiency and a decrease in daytime napping (106 ± 68 min to 80 ± 51 min) from baseline to post-intervention.	Dementia – either probably AD or vascular dementia	NS	Start: End: Durat: 3 days	NS	Software also not mentioned	None	Demonstrated ability to detect significant difference between groups or conditions in well-designed trial See study outcomes.
{Richards, 2005 #639}	4b	The goal of this study was to test the efficacy of an individualized social activity intervention (ISAI) on improving sleep disturbances through a randomized trial using a pretest/posttest design in nursing home patients with dementia.	Total Study Enroll:172 Compl:139	Int:71 68	52%	79 ± 8.4 (range NS)	The individualized social activity intervention recuced daytime sleep (71.6 ± 69 vs. 110.8 ± 68.7 min) and lowered the day/night sleep ratio (0.48 ± 0.58 vs. 0.64 ± 0.80 cpm[ared to the control group.	Dementia (MMSE<24) and sleep efficiency <85% as measured by actigraphy	Actigraph (AMI)	Start: End: Durat: Days1-5 of baseline and 17-21 of treatment/control	Variables automatically derived from Actigraph software.	Actigraph software	None	Acti measured less daytime sleep (71.6 ± 69 vs. 110.8 ± 68.7 min) and lower day/night sleep ratio (0.48 ± 0.58 vs. 0.64 ± 0.80) in the intervention than the control group. Actigraphically-measured nighttime sleep variables were not different between the groups (minutes to sleep onset, minutes slept, minutes awake and sleep efficiency).
{Ruths, 2004 #724}	2	A randomized, reference group controlled, double-blind study of abrupt discontinuation of antipsychotic meds (for non-psychotic indications) in nursing home residents w/ dementia. Continuous actigraphy and periodic Behav/symptom ratings (NPI-Q) were carried out across a 6-week study period where the Intervention group remained off of antipsychotics for 4 weeks and the reference group continued on meds.	Enroll: 30 Compl: 28	14 Ps in Ref group	20%	83.4 +/- 6.9 yrs	Following antipsychotic w/drawal, behavioral scores remained stable or improved in 11 Ps and worsened in 4 Ps. One patient was restarted on antipsychotics, 9 days after w/drawal due to incr leg movements.	Nursing Home Dementia Residents	Actiwatch (Cambridge Neurotechnology, Ltd)	Start NS End: NS Durat: >6 weeks	Proprietary Software – 3, 7-day record files: 2nd Baseline week, Weeks 1 and 4 of the intervention to corres w/ the timing of the NPI-Q ratings.	Pre-defined nighttime window of 11pm to 7am	Actigraphy Sleep Logs Subjective Measures Inventory Questionnaire	Actigraphy estimates showed a decr sleep effic% from 86% to 75% (54 mins, p=.029)w/ abrupt drug w/drawal. Restlessness was sign correlated w/ mean estimates of 24-hour activity (r=0.64,p<.001) and daytime activity (r=0.62,p<.001) in both groups, while sleep probs (NPI-Q) were corr w/ nighttime activity (r=0.60,p=.001).

{Rybarczyk, 2002 #808}	2	This study was designed to test two behavioral treatments for individuals with geriatric insomnia versus a control condition. (CBT, home-based audio relaxation treatment [HART])	CBT, HART, Control (in that order) Enroll: 16, 18, 17 Completed treatment: 11, 14, 13 Compl F/u: 10, 13, 12		64%, 29%, 38%	66.5, 65.6, 71.4	CBT and HART groups showed significant improvement on 5 and 3, respectively, out of 7 self-report measures of sleep at 4 mo f/u. No significant changes in sleep measures were seen for sleep variables measured via actigraphy.	Insomnia	Model BMA (AMI	Start: ns End: ns Durat: 1 week duration at 3 different time points	Action W (variables: TST, SE, WASO)	Cole-Kripke	Sleep Logs	Correlations b/w actigraphic and self-reported sleep measures were generally very low, with average correlations across pre- and post-tx and f/u being: -0.14 for SE; 0.08 for WASO; & 0.03 for TST. Also, repeated measures ANOVA revealed no group X time effect for SE, WASO or TST.
{Sadeh, 2004 #726}	3	To assess the role of coping style in moderating the link betw stress and sleep in normal sleepers, 2 stress conditions were chosen. Nightly actigraphy occurred across a normal 5-day academic period (low stress condition) and again across a 5-day period during the eval week for acceptance into grad school (high stress).	Normal Ss Enroll: 36 Compl: 36	NA	22%	24.75 +/- 2.17 yrs (22-32 yrs)	Ss w/ high emotion focused coping (EFC) shortened their sleep, while those w/ low EFC extended their sleep during the high stress period (p<.005). Problem focused coping (PFC) was assoc w/ more sleep (longer sleep period, p<.05 and total sleep time, p<.005) irrespective of high or low stress cond.	Normal Sleepers	AMA-32 Actigraph (AMI)	Start: Bedtime End: AM Rise time Durat: 5 consec nights x 2-time pts (low-stress week and high-stress week	AMI software – Mode 18 data collection	Custom Software: Actigraphic Scoring Analysis program for an IBM compat PC (Sadeh et al, 1994); 90% validation w/PSG	Actigraphy Sleep Logs Subjective Measures	Decreases in sleep time from low-stress to high-stress conditions were observed w/acti. Perceived sleep quality also decreased in high stress conditions (high EFC group)
{Sadeh, 2004 #735}	2	Study I, of 2 studies, was employed to develop and validate (w/ both subjective-sleep diary and objective-actigraphy methods) a brief, infant sleep questionnaire (BISQ) that would be appropriate for screening in pediatric settings. (Study II was an internet application of the BISQ.)	Enroll: 43 Compl: 43	57 (actigraphy data from 55available)	60%-clinical group 53%-controls	12.3 mos +/- 5.5mos (6-29 mos)-clinical group 14.4 mos +/- 6.3 mos(5-26 mos)-	Psychometric, clinical, and ecological support was generated for the use of the BISQ as an infant sleep screening tool for clinical and research purposes. Test-retest reliability w/ repeated administrations of the BISQ were highly sign (P<.0001) for Noct TST (r=.82), daytime sleep duration (r=.89), # of night awakenings (r=.88), noct wakefulness duration (r=.95), noct SO Lat (r=.95), and settling time (r=.94). Clinical Guidelines for referrals: >3 awakes/night, >hour of wakefulness during	Infants/toddlers	AMA-32 Actigraph (AMI)	Start: NS End: NS Durat: 5-7 days	NS	SO Lat, SPT, TST, # of night awakes =/>5mins	24-hr Actigraphy Sleep Logs Subjective Measures	Only applies to Study I. Sign, but low, corrs were found betw the BISQ and actigraphic SO Lat (r=0.54; p<.001) and # of night awakes (r=0.42;p<.0001). The strongest corrs were betw daily log and actigraphic SO Lat (r=0.96; P<.0001)) and noct TST (r=0.87;p<.0001).
{Sazonov, 2004 #719}	5a	This study used actigraphy to determine the sleeping position of infants and measure their sleep/wake patterns	Enroll: Compl:26	NS	NS	34-42 weeks post-conceptual age	Accelerometer can be used to determine infant position	Participants included normal term infants, preterm infants, term infants with SIDS sibling, preterm infants with SIDS sibling	Accelerometer (brand not stated)	Start: End: Durat: mean PSG recording 7 hrs 54 min	Homegrown, involving logistic regressions and neural networks	NS	PSG	Both regression models and neural models had a tendency to over predict sleep
{Scherder, 2003 #772}	5b	A randomly assigned, single-blind, clinical trial of low-freq (CES) or placebo (no current applied) was carried out to assess the effects on the circadian activity-rest cycle and cortisol levels of institutionalized patients w/ Alzheimer's disease (AD).	Enroll: 8 Compl: 8	8	25%-Experimental 12%-Control	(Only group means; no SD's given)86.75 yrs – Experim87.88 yrs - Contrs	Low-freq CES had no sign effects on the rest-activity rhythm and/or cortisol levels in AD patients. Salivary cortisol incr after both CES and placebo.	Early Alzheimer's Disease (by NINCDS-ADRDA criteria)	Actiwatch (Cambridge, Neurotechnology)	Start: NS End: NS Durat: 1-week x3 time pts	Actiwatch Sleep Analysis 2001 Software (Cambridge, Neurotechnology)	Interdaily Stability(IS)-strength of coupling; Intradaily Variability(IV); Relative Amplitude(RA)	24-hr Actigraphy Salivary Cortisol Subjective Measure	No effect of cranial electro-stimulation on the rest-activity cycle
{Semler, 2005 #691}	3	A randomly assigned, counterbalanced study designed to manipulate positive vs negative, subjective perceptions about sleep in insomniacs through positive vs negative text feedback on the prior night's sleep.	Enroll: 33 Compl: 22	NA	25%	21.4 +/- 3.7 yrs	Negative feedback was assoc w/ more negative thoughts (p<.001), sleepiness (p<.01), monitoring for sleep-related threat (p<.01), and safety behaviors during the day (p<.001) relative to positive feedback.	Primary Insomnia (by DSM-IV)	Mini-MotionLogger Actigraph (AMI)	Start: NS End: NS Durat: 3 consec nights	Action-W Software (AMI)	Zero-Crossing Mode	Actigraphy Sleep/Wake Logs Subjective Measures	Under Negative feedback, incr monitoring for sleep-related threat (p=.003) and more safety behaviors during the day (p=.009) were assoc w/ actigraphic estimates of TST>6.5hrs compared to the group that received positive feedback but slept<6.5hrs. Actigraphic estimates of sleep did not differ sign by either feedback or night.
{Serfaty, 2002 #792}	3	The goal of this study was to examine the effect of exogenous melatonin (6mg) on sleep disturbance associated with dementia via a randomised double blind placebo controlled cross over trial.	Enroll:44 Compl:25	NS	16/25=64%	84.2 +7.6	Sleep was significantly disturbed in the sample population. Melatonin had no effect on median total time asleep (n=25, z=1.35, p=0.18), number of awakenings (n=25, z=0.32, p=0.75) or sleep efficiency (n=25, z=0.17, p=0.24). Nor were there any carry over effects from melatonin.	DSM-IV diagnoses of dementia; sleep disturbance as identified by main caregiver - defined as shouting or agitated behaviour and/or wandering on at least two nights per week	"Wrist actigraphy monitors & analysis software" supplied by Neurim Pharmaceutica ls Ltd (Tel Aviv, Israel)	Start: End: Durat: night period, only (not day)	NS	NS	Sleep Logs Subjective Measures	There was no effect of the intervention on sleep parameters measured by acti or by reports of sleep quality by visual analog scales. Caregiver reports were rarely filled out and there was no correlation between reports from diary sheets and objective information from sleep obtained from wrist actigraphy.
{Shibui, 1998 #1350}	4b	Report of a single case – man with non-24h sleep-wake syndrome.	Enroll: Compl:1		1%	43	Free-running sleep wake cycle was 25.8 h long; once this patients sleep-wake cycle and temperature rhythm became synchronous with this duration, his fatigue symptoms completely disappeared. Artificial bright light treatment allowed entrainment to 24h day without recurrence of fatigue symptoms.	Non-24h sleep-wake syndrome per ICSD (1990)	Actigraph, AMI	NS	Very little description of how data analyzed, other than plotting of actigraphy data.		None	Demonstrated ability to detect significant difference between groups or conditions in well-designed trial See study outcomes.
{Singer, 2003 #651}	2	This study was designed to examine the safety and efficacy of melatonin's soporific effect in patients with Alzheimer's Disease and nocturnal insomnia. Patients were randomized to either placebo, 2.5mg, or 10mg melatonin.	Enroll/Comp 2.5mg=54/1 10mg=51/4	Enroll/Comp Placebo=52/5	44%	77+/-9	Melatonin did not have a significant effect on objective sleep measures.	Insomnia in AD pts	Actiwatch AW64 (Mini-Mitter)	Start:NS End:NS Durat: Actigraphs were worn continuously throughout the 2- to 3-week screening period and the 10-week protocol.	Data gaps in a 24-hr period resulted in that segment being deleted. Single actigraphic record put together for entire 8 week treatment period. Noon to noon segments were created by the analysis program.	Actiwatch AW64 series sleep-algorithm	PSG Subjective Measures	In a subanalysis of the main study, sleep measured by actigraphy and PSG correlated r=.92, p<.01 in a subset of the sample (n=7 sbjs over a total of 18 nights). The mean difference in TST was 55.5 minutes (Act mean TST=389.9min; PSG mean TST=334.4min).
{Skjerve, 2004 #728}	4b	To evaluate the effect of bright light treatment on behavioral symptoms and activity level in patients with severe dementia	Enroll:11 Compl: 10	NS	70%	79 (range 65-87)	No improvement was found in sleep-wake measures after bright light treatment in the small sample of severe dementia patients. Measures included mesor, sleep efficiency, interdaily stability, intradaily variability, & relative amplitude. However, an effect was found for acrophase, such that activity acrophase late in the day during T1 (pre-tx) predicted a higher level of advance during T2 (during tx).	Severe dementia per Clinical Dementia Rating score	Actiwatch (Cambridge Neuro)	Start:ns End:ns Durat: 24h/d for 6wks of study (1 wk before tx; 4 wks during tx; 1 wk post-tx	NS	Ns, though actiwatch software assumed	None	No changes in sleep measures were observed. Bright light advanced the acrophase of the acti rhythm.
{Tang, 2004 #650}	3	A behavioral experiment designed to correct the perceptual distortion about sleep in patients w/ primary insomnia by supplying direct participatory feedback.	Enroll: 52 Compl: 40	NA	30%	(18-46 yrs)22.8 +/- 5.2 yrs-Shown Discrepancy24.6 +/- 7 yrs – Not Shown	Subj SO Lat estimates for the 3-nights after the intervent (shown discrepancy from Base data) were shorter relative to the Base 3-nights (p<.002). Subj estimates of TST were longer (over the next 3-nights) post- the intervention compared to pre-(Base) 3-nights (p<.001). Group Shown Discrepancy also reported lower sleep-related anxiety and preoccupation w/ sleep, post- the intervention compared to pre-(p<.001).	Primary Insomnia (by DSM-IV)	Mini Motionlogger Actigraph Basic (AMI)	Start: 2 hrs prior to BedtimeEnd: AM Rise Time Durat: 3 consec nights x 2	Action-W	Zero-Crossing Mode; Action-W using the Cole-Kripke algorithm	Actigraphy Sleep Logs Subjective Measures	At Base (Nights 1-3), Ps overestimated their SO Lat by 37-mins and underestim TST by 46 mins. No sign Tx effects were found for either Actgraphic SO Lat or TST. All sign findings were confined to subj sleep estimates by Ps. No intrasubject statistical comparsions of subject and object SL and TST made.
{Tractenberg, 2003 #652}	3	This study sought to validate the Sleep Disorders Inventory (SDI) as a novel instrument for use in assessing and quantifying sleep disturbance/disorder in Alzheimer's Disease patients. This study was a post hoc analysis of baseline responses to the SDI in a trial of melatonin for the treatment of sleep disturbances in patients with AD	Enroll:157 Compl:104	NS	51%	75.5+/-8.6	This study provides initial validation data for the SDI as a tool to assess and quant sleep disturbance in patients with suspected or probable Alzheimer's Disease.	Possible or probably Alzheimer's Disease, per NINCDS-ADRDA criteria	Actiwatch AW64 (Mini-Mitter)	Start:NS End:NS Durat: Actigraphs were worn continuously throughout the 2- to 3-week screening period and the 10-week protocol.	Data gaps in a 24-hr period resulted in that segment being deleted. Single actigraphic record put together for entire 8 week treatment period. Noon to noon segments were created by the analysis program.	Actiwatch AW64 series sleep-algorithm	Caregiver Logs Sleep Disorders Inventory (SDI)	Low but significant correlations were observed between SDI with night TST, SE, WASO, DayTST/ NightTST ratio (r = 0.21 to 0.28). SDI was NOT associated with DayTST and 24hrTST. The highest correlations were between daily sleep quality ratings and acti for sleep efficiency (r = 0.49) and WASO (r = 0.41)

{Tuisku, 2003 #1007}	3a	To determine if lower limb movement recorded with actigraphy would distinguish pts with RLS from normal controls	Enroll:NS Compl:39	15	6.60%	RLS 50.3 ± 11.2 (26-62), controls 49.3 ±6.7 (33-57)	Nocturnal motor activity per minute distinguished pt from control groups more effectively than PLM Index and controlled rest during sitting test	RLS	NS	Start: End: Durat: over-night	Digital integration method of the PAM-3 (software used)	NS	Subjective Measures	Comparison to reference standard 1. Nocturnal activity distinguished patient and control groups, with RLS pts having significantly more motor activity at night than control subjects 2. RLS pts also exhibited more motor activity during sleep latency and during sleep than control subjects
{Tuisku, 2005 #1002}	4b	To evaluate the effect of pramipexole on RLS through measurement of ankle actigraphy.	Enroll:15 Compl:	NS	1/15=7%	50.3+/-11.2	Nocturnal lower limb activity and controlled rest activity decreased significantly during the intervention in parallel with the subjectively reported relief of RLS sxs.	RLS	PAM3 (IM Systems, Baltimore, MD)	Start: ns End:ns Durat: "actometric measurements and subjective	Waist monitor served as a reference to control for gross movements	PAM3 software	Subjective Measures	Demonstrated ability to detect significant difference between groups or conditions in well-designed trial Significant correlation between the decrease in nocturnal activity and subjective improvement in VAS scores (r=0.44, p=.05)
{Tworoger, 2005 #1363}	4b	This study describes objective measurement of sleep and subjective sleep quality in young adult women	Enroll:73 Compl:58	NA	NA	30.6 ±5.3 (20-40)	1. Sleep measures during the leutal phase of the cycle vary widely in women aged 20-40 sleeping at home 2. Sleep times were varied, with 26 min later bedtime on weekends 3. Perceived stress was associated with poorer subjective sleep but not objective recordings of sleep 4. Self-reported poor sleep not associated with BMI, menstrual cycle length or exercise	Healthy women during luteal phase of cycle	Acti-watch 16 (MM)	Start: End: Durat:nightly for 10 (2 periods of 5 nights)	homegrown	Cole et al (1992) and validation data supplied by MM	Subjective Measures	There were low interclass correlations for TST, time in bed, and sleep onset, but high ICC for sleep efficiency and total wake time Sleep efficiency had highest ICC across time2
{Uchiyama, 2002 #1349}	4b	This study aimed to clarify the phase angle between sleep propensity and the circadian pacemaker in patients with non-24-hour sleep-wake syndrome. Five patients with non-24-hour sleep-wake syndrome and 15 age- and gender-matched controls were studied.	Enroll:5 Compl:5	15	Int: 80% Cnt: 80%	Int:26.6 ± 8(16-39) Cntrl: ns ± ns (19-35)	The period of the sleep-wake cycle observed at home was longer in the non-24hour sleep-wake syndrome group (25.12hrs) than in the controls (24.02hrs) (p<.0001) (measured by actigraphy). The interval from sleep propensity onset to the melaton midpoint was significantly shorter in the non-24 patients than in the controls, while the interval from the melatonin midpoint to the sleep propensity offset was significantly longer in the non-24 patients than in the controls.	Non-24-hour sleep-wake syndrome, per 1997 ICSD criteria	Actigraph (AMI)	Start: ns End: ns Durat: 14 days	Actigraphy derived sleep onset from the 8-10 days prior to the laboratory admission was used to estimate sleep onset. Two blinded raters determined sleep onset and offset times.	Action3	Sleep Logs	Demonstrated ability to detect significant difference between groups or conditions in well-designed trial The period of the sleep-wake cycle observed at home was longer in the non-24hour sleep-wake syndrome group (25.12 ± .18hrs) than in the controls (24.02 ± .02hrs) (p<.0001). The habitual sleep length was significantly longer in the non-24 pts (9.58 ± .60) than in the controls (7.33 ± .31).
{Vallieres, 2003 #758}	2	This study tested the utility and sensitivity of actigraphy as an outcome measure for treatment of insomnia	Enroll:17 Compl:17	NA	41.20%	41.6 ± 5.7 (34-50)	Treatment effects were detectible using all three measures	insomnia	Individual Monitoring Systems (actigraph)	Start: End: Durat: 4 nights	IM systems software	NS	PSG Sleep Logs	1. TST and SE were similar for the 3 measures, but acti closer to PSG than sleep logs. 2 Compared to PSG, both actigraphy and sleep logs overestimated total wake time 2. Compared to PSG, acti underestimated SOL and sleep log overestimated it.
{Van der Heijden, 2005 #684	3	To investigate whether ADHD-related SO insomnia is a circadian rhythm disorder, actigraphic estimates of the sleep-wake rhythm and salivary DLMO were compared w/ ADHD kids w/chronic SO insomnia and a group of ADHD kids w/ no sleep probs (controls). All were free of any psychotropic med hx. (Study was part of an ongoing randomized, placebo-controlled clinical trial of melatonin tx for chronic SO insomnia in ADHD.)	Enroll: 87Compl: 87(actigraphic data on 66)	33 ADHD w/ no SO insomnia(actigraphic data on 20)	76%-ADHD w/ SO Insomnia 9%-ADHD contrs	8.8 +/- 1.7 yrs-ADHD w/ SO Insomnia8.2 +/- 2.0 yrs-ADHD contrs	SO was ~1 hour later (21:38 +/- 0.54 mins) w/ wake-up times ~33mins later (7:29 +/-0.39 mins) in ADHD kids w/ SO insomnia compared to the SO (20:49 +/- 0.49 mins) and wake-up times (6:56 +/- 0.46 mins) of the ADHD contr kids.	Attention-Deficit/Hyperactivity Disorder (ADHD) by DSM-IV w/ or w/out SO insomnia	Actiwatch (Cambridge, Neurotechnology)	Start: NSEnd: NSDurat: 7 days	Actiwatch Software (Cambridge, Neurotechnology)	Validated for sleep parameters(Kushida et al, 2001,Sleep Med 2(5):389-396); rhythm parameters (Van Someren et al, 1999, Chronobiol Int, 16(4): 505-518)	Sleep Logs Subjective Measures	The mean SO (p<.001)and Wake-up times (p<.002) were signlater as was the DLMO (p<.001) in the ADHD kids w/ chronic SO insomnia (20:32 +/- 0:55 mins) compared to the ADHD contrs (19:47 +/- 0:49 mins).
{Wee, 2004 #1282}	4b	To determine whether the type of ophthalmic disease (visual impair w/ optic nerve disease vs an intact optic nerve) in Blind teens is predictive of sleep/wake disturbances. A normal sighted control group was employed.	Enroll: 25 Compl: 25	12	Sex- NS	(12-20 yrs for all 37 Ps/S's) 16 +/- 1.9 yrs-Blind w/ optic nerve disease 15.9 +/- 2.4 yrs-	Only presence or absence of optic nerve dis was a sign predictor of daytime napping. Blind teens w/ optic nerve disease (8 of 11) were 9.1-times more likely to nap >20-mins daily compared to blind teens w/ intact optic nerves (3 of 14, p=.02) and 21.3-times more likely than sighted teens (only 1 of 12, p=.04).	Visually Impaired teens w/ or w/out optic nerve desease	Actiwatch-L (Mini)	Start: NS End: NS Durat: 14-days	Automated analysis w/ Actiware (Mini)	Actiware (Mini)	Sleep Logs Subjective Measures	The SD of the wake-up times across 14-days of actigraphy was used as the measure of Wake-up Time Instability. The blind Ss w/ optic nerve disease had >Wake-up Time Instability compared to either blind Ss w/ intact optic nerves or the sighted contrs (p=.02).
{Wilson, 2004 #745}	1	This study, using a double-blind cross-over design, evaluated if actigraphy could be used detect changes when pts were treated with temazepan, and to determine if an automated method of questionnaire data collection would be comparable with traditional data collection methods	Enroll:NS Compl:38	0	NS	NS	1. the majority of pts preferred to use the telephone system (22/38) of data collection. There were no significant differences in scores when responses on paper and pencil questionnaires were compaired to automatic telephone data collection 2. Significant effects were noticed on both subjective and objective measures with temazepan between treatment and placebo weeks	insomnia	Cambridge Neurotechnology, Actiwatch	Start: End: Durat:5 weeks	Software plus non-parametric analysis of rest activity patterns		Subjective Measures	Actigraphy showed significant treatment effects for hypnotic use (TST, immobility, fragmentation index). Low correlation between fragmentation index and subjective sleep quality (St. Mary's Hospital Sleep Questionnaire)
{Winkler, 2005 #682}	3	To investigate if Bright Light Tx (BLT) reverses the abnormalities of the circadian rest-activity cycle that tend to accompany SAD. A sex and age matched control group of normal Ss was included.	Enroll: 17 Compl: 17	17	24%	36.9 +/- 13.5 yrs	SAD Ps had a 6% attenuation of the amplitude of the activity-rest cycle (p=.025) which was phase delayed by 55-mins (p=.023) compared w/ controls at Week 1. BLT in SAD Ps resulted in an incr of relative ampli (p=.005) from Week 2 on and an advance of the activity-rest cycle in Weeks 3 and 4 (p=.036). At week 4, there were no longer sign group diffs. Intradaily stability (coupling of activity to external zeitgebers) incr by 9% in both patients and healthy contrs by the 4th week (p=.032).	Seasonal Affective Disorder (SAD) – w/ fall-winter depression (by DSM-IV-TR)	Actiwatch Plus (Cambridge Neurotechnology Ltd)	Start: NS End: NS Durat: 4-weeks	Actiwatch Sleep Analysis 2001 software, Ver 1.19. Sleep analysis used a Medium Sens to estimate actigraphic sleep parameters	Total daylight and dark activity, derived from actual sunrise/ sunset times in Vienna; Cosinor analysis	24-hr Actigraphy Portable Light Boxes Sleep Logs Subjective Measures	Comparison to reference standard SAD Ps had 43% lower daylight activity (p=.006), 33% lower total activity (p=.031), and a lower Sleep Eff% (p=.030) compared to contrs in Week 1, all of which incr sign after 4 weeks of BLT. After 4 weeks of BLT, no sign diffs were found betw SAD Ps and control Ss on activity measures.
{Wolfson, 2003 #663}	2	To examine the validity of self-reported survey estimates of sleep patterns in adolescents using a comparison of retrospective (2-weeks) descriptions of sleep patterns w/ sleep diary reports and actigraphically estimated sleep parameters over a subsequent week.	Enroll: 302 Compl: 302	NA	35%	16 +/- 1.2 yrs (13.8 – 19.9 yrs	Survey estimates of TST and Wake-times were w/in 5-mins of those reported in diary and estimated by actigraphy. Bedtimes were 8-13-mins earlier than diary or actigraphy estimates. Ss reported sleeping ~30-mins longer on weekend nights compared to diaries or estimated by actigraphy. Survey reported weekend Wake-times were ~55-mins later compared to diaries or actigraphy estimates.	Adolescents	Mini Motionlogger Actigraph (AMI	Start: NS End: NS Durat: 8 days	Action-W2 software (AMI)/Custom-Acebo et al, 1999, Sleep,22:95-103;	Zero-Crossing Mode; Actigraphic Scoring Analysis ("Sadeh" algorithm)	24-Actigraphy Sleep Logs Subjective Measures	Survey reports of school and weekend night sleep behaviors were sign corr w/ both acti. The strength of the associations were consistently greater for school night variables compared to the corresponding weekend night variables.
{Yaron, 2004 #643}	4b	To evaluate the effect of rapid ascent to moderate altitud on sleep (actigraphy and logs) in infants and pre-verbal children. (Part of a larger study to examine the effects of acute high altitude exposure.)	Enroll: 37 Compl: 30	NA	43%	(4-33 mos) 19.5 +/- 10.8 mos-girls 13.9 +/- 8.5	Sleep patterns among infants/toddlers were sign disturbed (by inference from increased motion/activity counts across the nocturnal sleep period) during the 1st night after ascent to a moderate altitude (3109 m). This effect was acute, and activity levels were returning to baseline altitude levels already by the 2nd night after ascent.	Infants/toddlers (4 to 33 mos)	Mini-MotionLogger (AMI)	Start: NS End: NS Durat:7-days total (1-4 and 5-7 were contiguous)	Presume AMI but NS	Threshold used for activity counts but NS	24-hr Actigraphy Sleep Logs Subjective Measures	Sign incr in activity counts during the sleep period occurred for the 1st night after ascent to 3109 m compared to baseline altitude (1610-1645 m) at home or in a hotel. Activity during sleep was already decr back towards baseline levels by the 2nd night of altitude ascent.
{Zucconi, 2003 #759}	2	Dose-finding study to determine if cabergoline reduces symptoms of RLS in patients with moderate to severe symptoms	Enroll:12 Compl:10	0	68%	56.6 (38-73)	Cabergoline significantly reduced symptom severity compared to placebo as measured by IRLLSSG Rating Scale and Clinical Global Impression Scale. Mean motor activity as measured by actigraphy also decreased significantly	RLS	Am Motionlogger	Start:NS End:NS Durat: 4 nights (baseline, T), T1, and T2)	NS	NS	PSG Subjective Measures	Blind, prospective comparison to reference standard Mean motor activity (as measured by actigraphy) decreased with treatment

Actigraphy Conclusions

Useful for detection of treatment outcomes in residents of nursing homes

High correlation between acti and retrospective reports (both parental and from the child) in normals, but not patients with cystic fibrosis.

Reasonable correlation between actigraphy and retrospective reports for bedtimes and waketimes; the exact time was off by 10 to to 22 min, respectively. There was no correlation between sleep complaints and sleep timing.
Acti can be used to measure differences in day/night activity levels in children and adolescents.

Useful for detection of treatment outcomes in special populations

Consistent results for sleep quality between actigraphy and sleep logs (both no change) in healthy older adults (both with and without sleep maintenance problems)

Actigraphy identified 40% of patients diagnosed with narcolepsy by sleep > 9 h. May be useful as one component of a multi model dx of hypersomnia.

Increased activity levels during the daytime were consistent with decreases in objective and subjective sleepiness. Actigraphy not sensitive to changes in sleep following slow release caffeine.

These two commercially available monitors are similar, particularly with a medium sensitivity setting for the actiwatch. Detection of wake depends on the sensitivity setting of the activity monitor.

Actigraphy used to assess sleep timing and duration across the day and night in night-shift workers. Shorter sleep times were consistent with self-reports of poor sleep quality.

Changes in mean activity level were consistent w/changes in PSG-SE% following transmeridian travel in normal sleepers, but acti sleep parameters were not. Group diff in phase shifts of DLMO were not accompanied by changes in acti measures.

Acti is useful to monitor compliance to scheduled bedtime and waketime. Compliance to schedules and diaries is greater if subjects are told that they are being monitored by the actigraph.

Actigraphy data can be used in field studies as a partial substitute for “gold standard” markers of sleep and the body clock, e.g. PSG, core temperature, and melatonin. The authors note that comparisons of custom activity algorithms with established markers of sleep and the body clock are necessary.

Acti was used to validate the sleep log data. With the exception of SOL, nighttime sleep parameters showed significant correlations in at least 76% of subjects.

Authors summary - Self-reported sleep revealed a greater severity of symptoms than either collateral reports or actigraphy, agreement between logs and actigraphy were comparable when averaged over days, but the nightly concordance was poor to moderately good.
Activity counts (without sleep analysis software) are not comparable to subjective measures of sleep quality

Acti consistent with parental logs of sleep disruption and with PSG for frequent arousals and a reduced duration of sleep relative to controls.

High sensitivity for identification of sleep > 97%, but low specificity for identification of intermittent wake periods < 44%.

Changes in motor activity can be detected by activity monitors

Outcome measure for therapy in patients w/ severe AD

For TIB and SOL, acti did not differ from PSG and the correlation between logs and PSG was significantly lower than between acti and PSG. Acti measures of TST, WASO, TWT and sleep efficiency differed from PSG in a population with differing sleep disorders.

actigraphy combined with standard measures of respiratory paramters may assist in the assessment of sleep disordered breathing severity.

Not a good association between acti and the sleep habits survey in healthy children.

Acti can be used to measure adherence to a sleep schedule in children

Acti can detect changes in circadian activity rhythms in infants.

Caregiver reports and actigraphy data were similar for sleep onset and offset, but actigraphy showed more WASO than nurse observations.

Acti used to measure treatment outcome in demented nursing home patients with sleep disturbances. Authors created their own 5-item behavioral sleep observation scale for this study, and the results were similar to that found for the actigraphically measured sleep parameters.

Acti used to measure treatment outcome in demented nursing home patients with sleep disturbances.

High correlation between PSG and acti for TST. Actigraphy may be useful for assessing improvements in sleep with treatment.

For differences between groups and conditions, acti was consistent with self-reported perceptions of sleep disturbance in healthy new parents.

High agreement between observer reports and acti estimates of sleep/wake in infants. Agreement was higher at 6 mos of age than at 1 mo.

Actigraphy used to assess differences in circadian rhythms and sleep duration between two pediatric groups.

Used as a follow-up measure for tx of SDB by assessing movements between 2 - 3 units (brief arousals)

In controls and patients w/AD, but not FTD, changes in the rhythm of activity paralleled changes in the temperature rhythm.

Activity measurements are consistent with parental diaries of sleep across the day and night in healthy infants.

In patients with sleep problems, subjective sleep quality was worse than acti estimates. Good sleepers tended to overestimate sleep quality relative to acti measures (not compared statistically).

Actigraphy demonstrated an ability to detect significant differences between groups (dementia severity) for consolidation of sleep/wake (NPCRA is a circadian analysis)

This specialized device and software had good agreement with PSG in normals, but less as SDB increased.

Compared to acti, the shorter duration sleepers tended to underestimat sleep duration while the longe duration sleepers tended to overestimat sleep duration.

Consistent with caregiver report of bedtime and waketime. Actigraphy detects more wake than caregiver reports.

Actigraphy could detect differences in sleep parameters between controls and subjects with fibromyalgia and co-morbid depression

24-hr Actigraphy is a suitable non-invasive method to characterize inter-individual variability in the activity-rest behavior of pre-term and full-term neonates and diffs in sleep duration.

Phase of the sleep/wake rhythm at home was correlated with the timing of circadian phase markers.

Measure of habitual sleep duration at home in adolescents.

Acti used to monitor 24-h sleep over 14 days in free running blind subjects. TST consistent w/PSG, but sleep efficiency was significantly higher by acti in these subjects with disturbed sleep.

1. Acti reasonable in measuring WASO, TST, Sleep Eff% and # of noct awakenings, but not sleep latency, in insomniacs. 2. Not as close to PSG measures in insomniacs as in normals. 3. Actigraphy closer to PSG values than sleep diary to PSG.

80% agreement w/ PSG but overestimates TST in healthy subjects (r = 0.70). Agreement was higher in middle aged than in elderly subjects.

The settings of the algorithm can have a significant impact on the scoring of sleep and wake by acti. Higher agreement w/PSG in good sleepers than in subjects w/lower SE%.

High correlation between logs and acti for TST in non-complaining good sleepers, but not in subjects complaining of poor sleep.

Actigraphy is able to detect treatment-induced improvements in sleep in patients with dementia

Shifts in sleep and activity rhythms are similar to those observed in circadian phase markers.

Acti-measured sleep timing is strongly correlated with the timing of circadian phase markers.

Consistent results between actigraphy and sleep logs for TST and sleep efficiency. PSG showed significant differences in TST, for actigraphy this was a non-significant trend.

Good correlation between questionnaire bedtime and waketime and acti in the majority of healthy subjects.

Actigraphy is not sufficiently accurate to diagnose PLMD in children

Significant differences in both subjective and objective SOL in insomniacs vs. good sleepers.

Acti useful to assess circadian rhythms of sleep/wake activity in infants.

Acti-used to measure treatment-induced changes in leg activity

Activity level is weakly associated with subjective sleep quality.There was no sleep analysis conducted.

There were no significant differences in nocturnal sleep estimates between the two placements in elementary school age children. Diurnal activity measurements may be more affected by placement.

Acti revealed baseline to post-tx changes in sleep parameters in children with Asperger's Syndrome.

Specialized device for assessment of sleep apnea and arousal. Automatic evaluation of "wake" vs. "sleep" based on activity level; also evaluates oxygen saturations and the PAT signal attenuations.No correlation for TST w/PSG

Minimal effect of tx on either subjective or objective measures. Study may have been underpowered to detect diffs.

The longer the subjective sleep latency the more it differed from acti. The shorter self-reported TST, the more it differed from acti.

Acti measured treatment outcome in nursing home patients with dementia

Significant associations between ratings of restlessnes and activity level, and between ratings of sleep problems and night time activity. The association between rating of sleep problems and sleep efficiency did not reach significance.

Very low correlations were found between acti and self-reported sleep measures in older adults with insomnia and co-morbid illness

Acti used as an outcome measure to detect stress-related changes in sleep.

High correlations between daily caregiver sleep logs and acti in infants for SOL and TST. Retrospective data and acti had low to moderate correlations.

Used in an experimental protocol to assess the impact of subjective estimates of sleep when objectively measured sleep is the same.

Acti used as an outcome measure in RCT in patients with dementia and sleep problems. Acti data lost from many subjects due to removal or refusal to wear watches, but less lost data than from caregiver reports. Sleep diary reports could not be used.

High correlation between acti and PSG, but acti consistently overestimated sleep in Alzheimer's patients.

Ability to detect rhythm of activity in patients with severe dementia.

Study shows that feedback about objective sleep timing w/ actigraphy can alter the subjective perception of sleep.

Acti is more closely associated with daily caregiver ratings of sleep quality than retrospective ratings of sleep quality in patients with PRAD and sleep disturbance.

One night of actigraphy data was unreliable for measuring total sleep time, sleep onset, and time in bed (intraclass correlation < or =.15) but was acceptable for measuring sleep efficiency and total wake time (intraclass correlation [ICC]=.52). Actigraphy is feasible for measuring sleep, but multiple recording nights may be needed to obtain reliable estimates.

Acti more similar to PSG than sleep logs in subjects w/primary insomnia. Also sensitive for detecting the effects of tx on some parameters.

Later bedtimes and waketimes are paralleled by later DLMO in children with ADHD

Detection of daytime napping and wake time instabilit in young subjects with visual dysfunction.

Both acti and subjective reports showed signif tx effects, but the subjective effects were greater in magnitude and lasted longer in patients w/ insomnia.

In adolescents, the highest association between survey data and acti was for wake-time during the week (r = 0.77), followed by bedtime and sleep duration. The lowest correlation was for weekend sleep duration (r = 0.31).

Altitude-induced disruption of sleep documented by a increase in activity counts in young children.