



Insomnia and Aging: Epidemiology and Treatment

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Outline of Presentation

- Epidemiology and morbidity of insomnia
- Current state of evidence on insomnia treatment
- Previous research on insomnia treatment in older adults
- Future research - what should be done next ?

Normal Changes in Sleep with Aging

- Sleep quality
 - Decrease slow-wave sleep
 - Increase Stage 1 sleep and time spent awake in bed
- Sleep continuity
 - Reduce sleep continuity and sleep efficiency
- Total sleep time
 - May decrease in some but not all older individuals
 - Increase daytime napping
- Timing of sleep
 - Tendancy to advance sleep-wake schedule

Prevalence and Significance of Insomnia in the Elderly

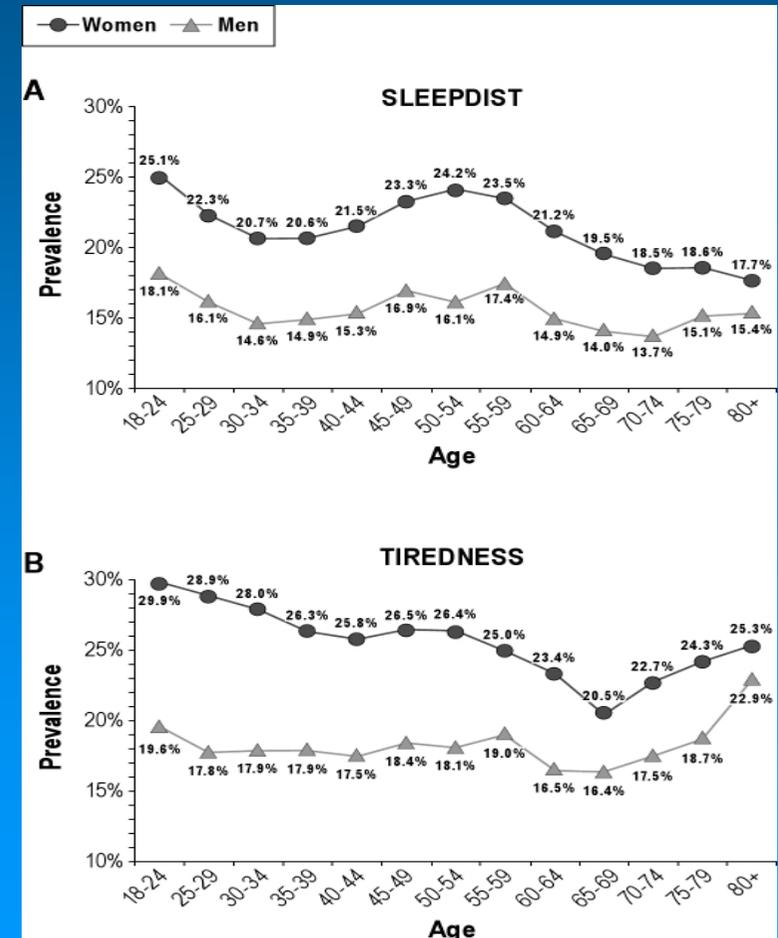
- Insomnia complaints very common in older adults - 19% (DIS), 30% (DMS), 19% (EMA), 43% (DIMS), 13% (not rested), 57% (any), < 20% (no complaint)
- Increased rate of hypnotic use with aging
- More frequent comorbid medical and sleep disorders
- Insomnia/sleep disturbances associated with increased physical (falls) and psychological morbidity (depression), and increased risk of dementia and nursing home placements

<https://youtu.be/55nu0-876ql>

Age and Sleep Disturbances

U.S. Behavioral Risk Factor Surveillance System (CDC)

- Cross-sectional analysis of data from the 2006 BRFSS (N = 155,877)
- Difficulty falling or staying asleep \geq 6 nights/wk in last 2 wks
- Both sleep disturbances and tiredness declined across life span
- Age per se is not associated with increased sleep disturbances



Natural History of Insomnia

Telephone survey
N = 12 000

Recruitment of participants for longitudinal study
4416 completed baseline assessment; final N = 3939

Good Sleepers
N = 2184 (55.4%)

Insomnia Symptoms
N = 1111 (28.2%)

Insomnia Syndrome
N = 644 (16.3%)

Participants fill out a postal evaluation at each assessment period

Baseline

6 months

1 year

2 years

3 years

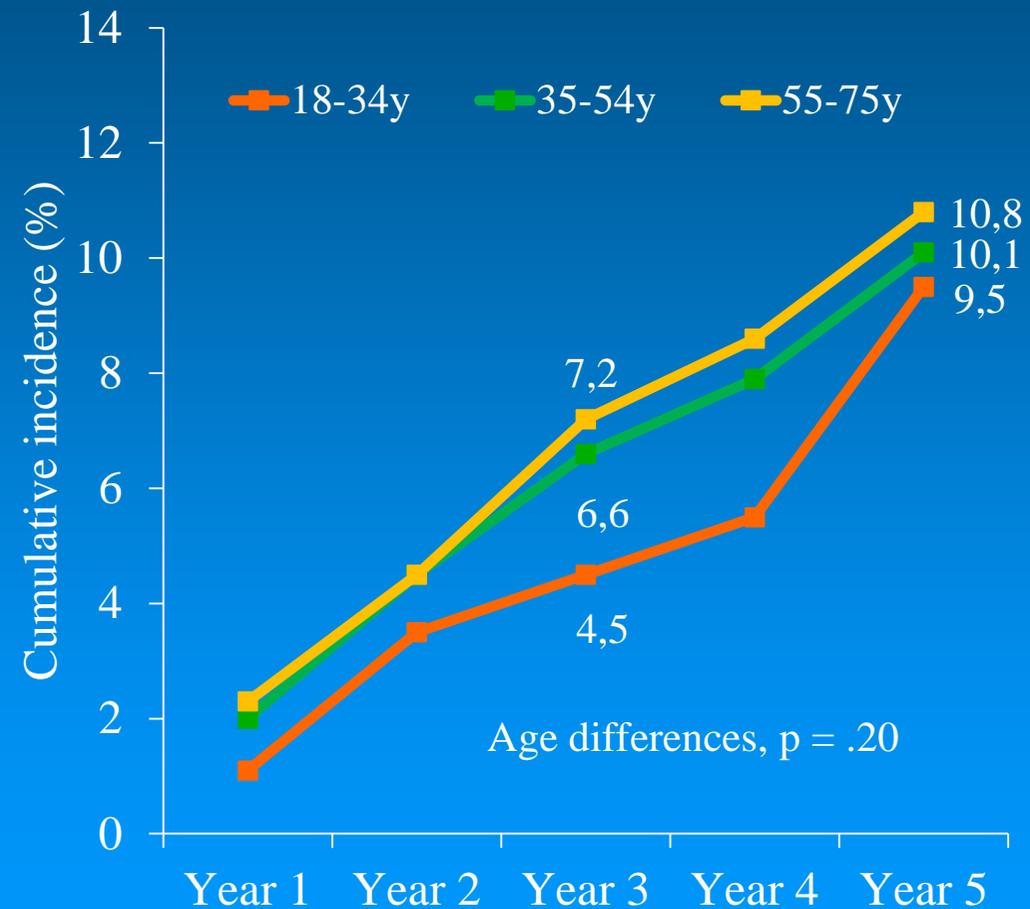
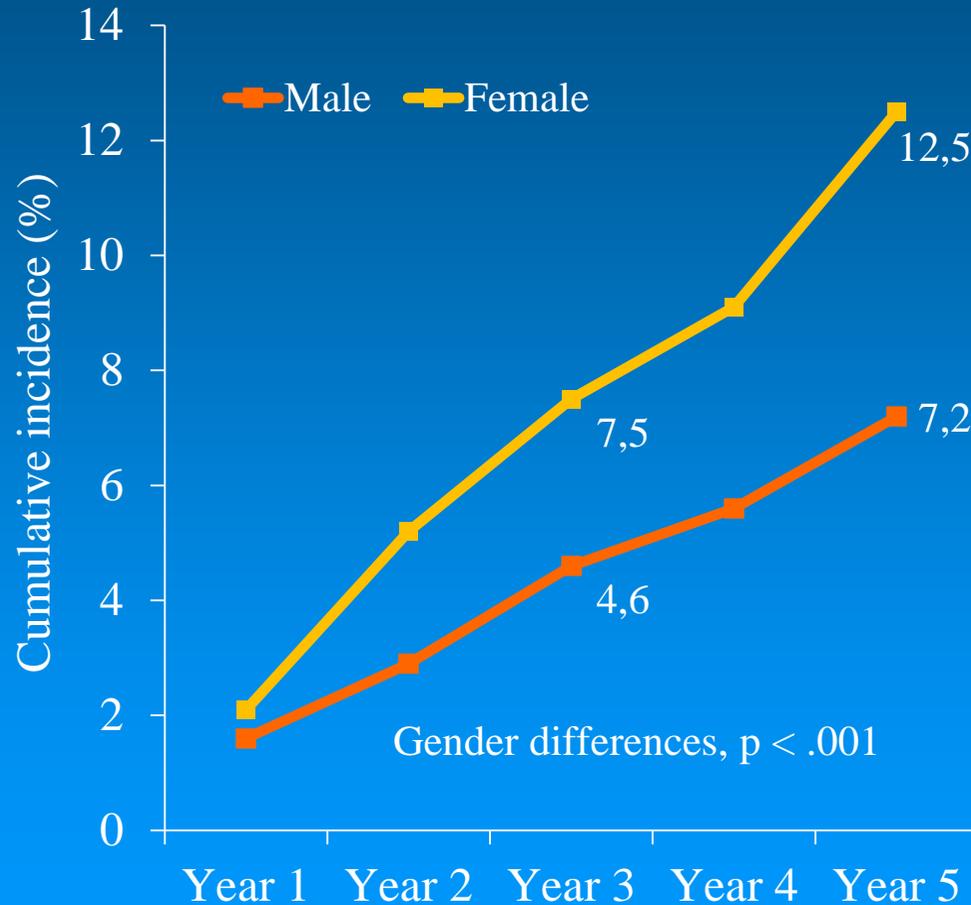
4 years

5 years

Annual Incidence of Insomnia

Cumulative incidence of insomnia Over a 5-year Period

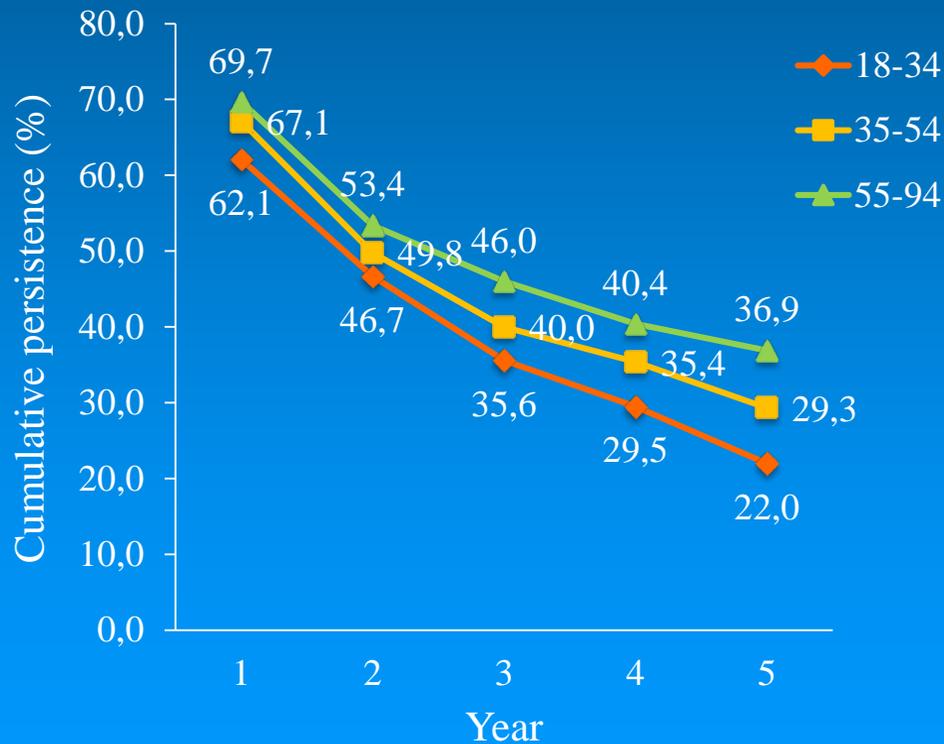
N = 2184 with no insomnia complaints at baseline (current or past)



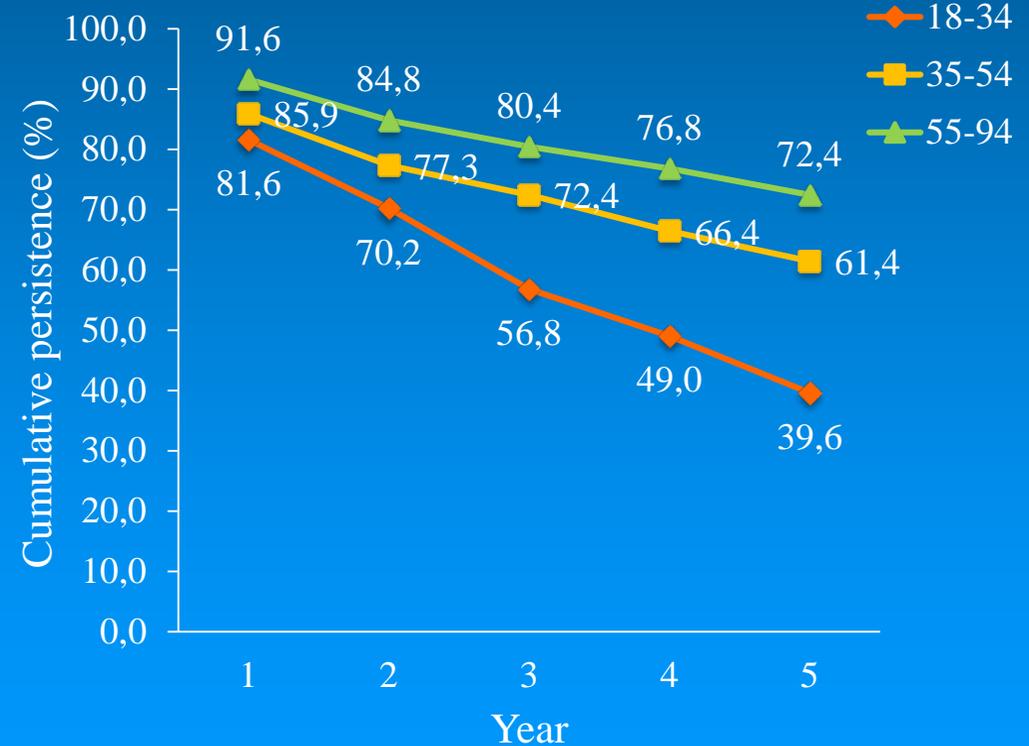
Insomnia is often a Persistent Problem

N = 1755 with insomnia at baseline

Persistence Rates in 1111 Participants with Insomnia Symptoms at Baseline



Persistence Rates in 644 Participants with Insomnia Syndrome at Baseline



Risk Factors For Sleep Disturbances in Older Adults

Systematic Review of 21 longitudinal studies

- Female gender, depressed mood, and physical illnesses are the most consistently identified risk factors for sleep disturbances
- Chronological aging itself may not independently increase the risk of sleep disturbances
- Because sleep disturbances may also worsen depression and some physical illnesses, it is especially important to treat sleep problems in order to prevent a cycle of risk relations detrimental to overall health.

Burden of Persistent Insomnia

- Psychiatric – Increased risks of depression and suicide
- Health – Reduced QoL and increased risks of hypertension, diabetes, mortality
- Occupational - Decreased job performance and increased absenteeism and risks of disability
- Economic - Increased use of health care services/costs
- Public Safety - Increased risks of accidents

Baglioni C et al. *J Affect Disord* 2011; 135:10-19. Daley M et al. *Sleep* 2009; 32:55-64.

Laugsand et al. *Circulation* 2011; 124:2073-81. Vgontzas et al. *Sleep* 2009; 2010; 2012.

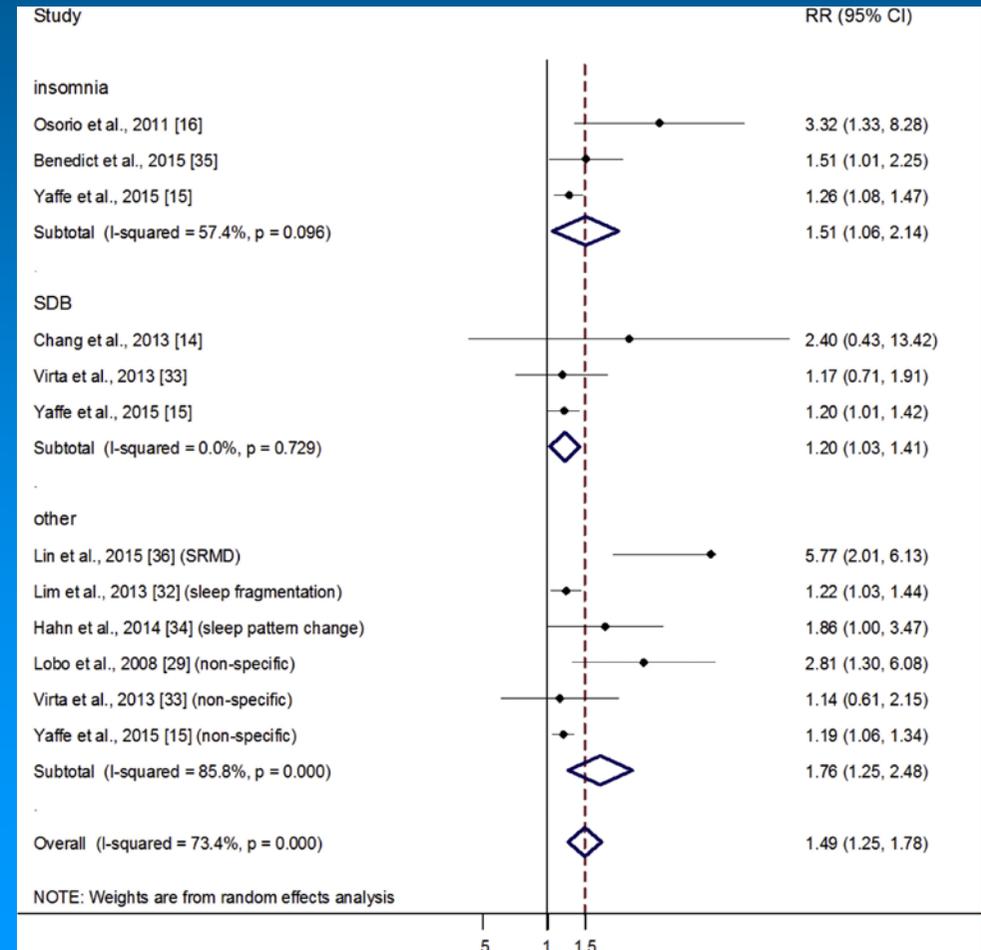
Perlis et al. *Sleep Med Rev* 2016; 29:101-07. Sivertsen et al. *Am J Epidemiol* 2006 163:1018-24.

Sleep disturbances/Insomnia as a Risk Factor for Dementia

Meta-Analysis

- 18 longitudinal studies (N = 246,786)
- 25,847 new dementia cases after an average of 9.5 year follow-up
- Subjects with sleep disturbances had a higher risk of incident all-cause dementia, AD, and vascular dementia
- Insomnia increased the risk of AD but not vascular or all-cause dementia
- SDB was associated with higher risk of all-cause dementia, AD, and vascular dementia

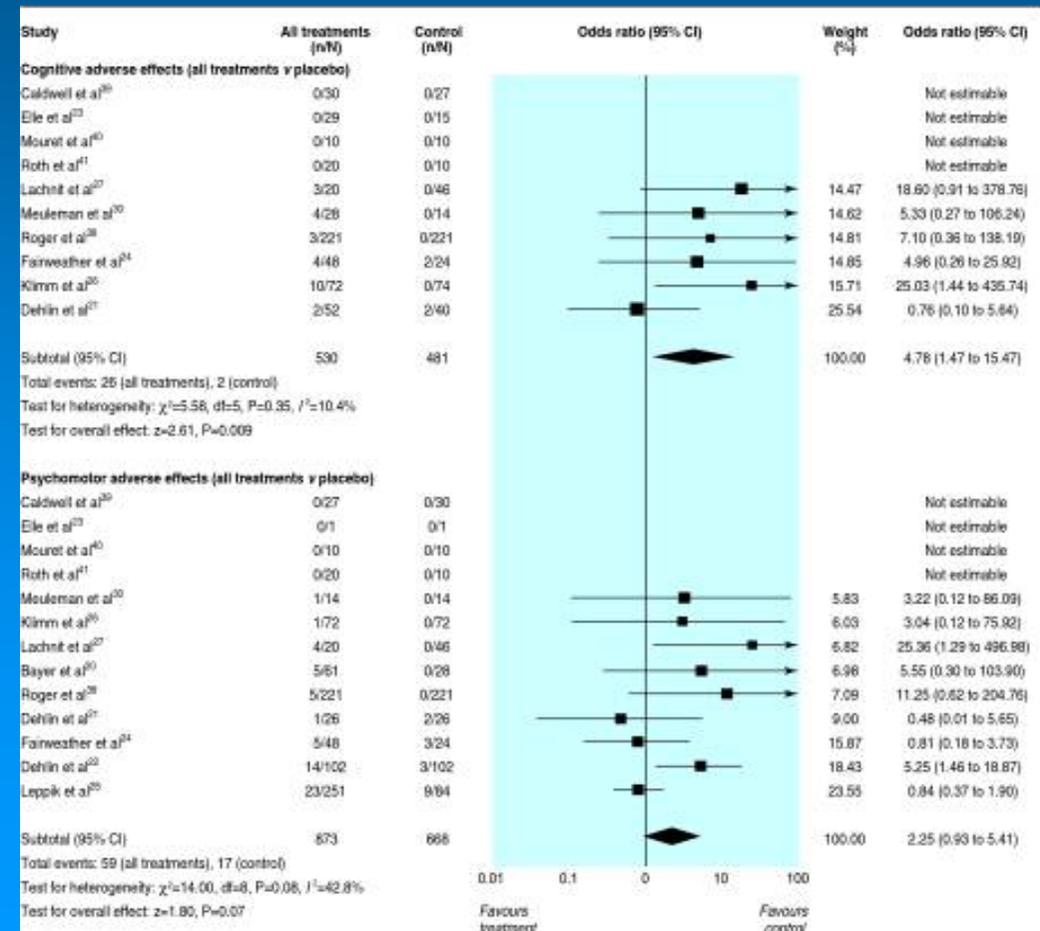
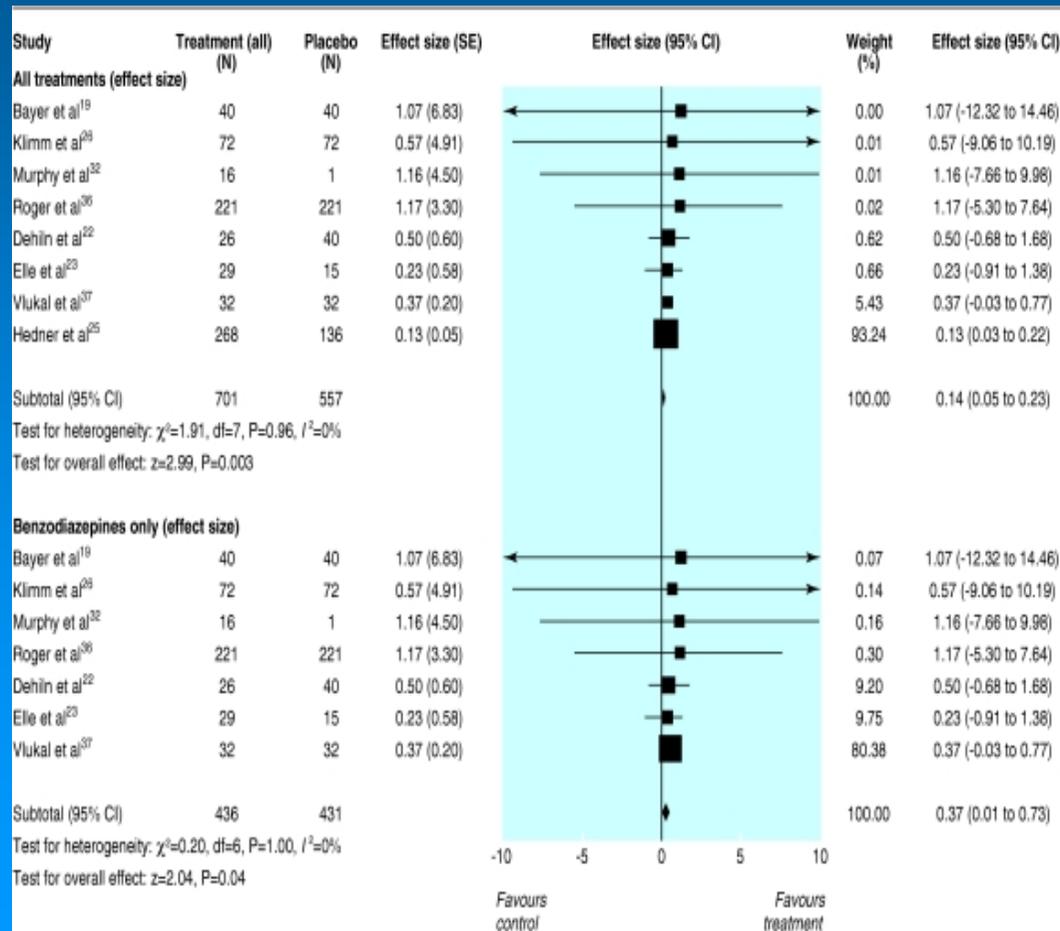
Relative risks of AD



Relative Risks/Benefits of Sedative Hypnotics in Older Adults (24 studies, 2417 adults > 60y/o)

Benefits on Sleep

Risks on Performance



Treatment Options for Insomnia

- Cognitive Behavioral Therapy (CBT-I)
- Pharmacotherapy
 - Benzodiazepine receptor agonists
 - Melatonin receptor agonists
 - Antidepressants
 - Antihistamines
 - Orexin antagonists
- Complementary/alternative approaches
 - Herbal products, dietary supplements, acupuncture

Current State of Evidence on Insomnia Therapies

NIH State of the Science Conference (2005)

British Association for Psychopharmacology Consensus Statement (2009)

- Treatments endorsed for chronic insomnia:
 - Cognitive Behavioral Therapy
 - Benzodiazepine Receptor Agonists (at least for short-term use)
 - Melatonin-Receptor Agonists (for older adults)
 - All other treatments not endorsed due to limited evidence of efficacy and/or safety concerns:
 - Complementary and alternative preparations
 - Antihistamines (OTC and prescription)
 - Antidepressants
 - Antipsychotics
-
- NIH State-of-the-Science Conference Statement on Manifestations and Management of Chronic Insomnia in Adults. 2005.
 - British Association for Psychopharmacology Consensus Statement on Evidence-based Treatment of Insomnia, Parasomnias and Circadian Rhythm Disorders. 2009.

Clinical Practice Guidelines for Insomnia Management (American College of Physicians, 2016)

Based on 60 (CBT) and 35 (Drug) RCT published between 2004-15

- “ACP recommends that all adult patients receive CBT-I as the initial treatment for chronic insomnia disorder”
- “ACP recommends that clinicians use a shared decision-making approach, including a discussion of the benefits, harms, and costs of short-term use of medications, to decide whether to add pharmacological therapy in adults in whom CBT-I alone was unsuccessful”

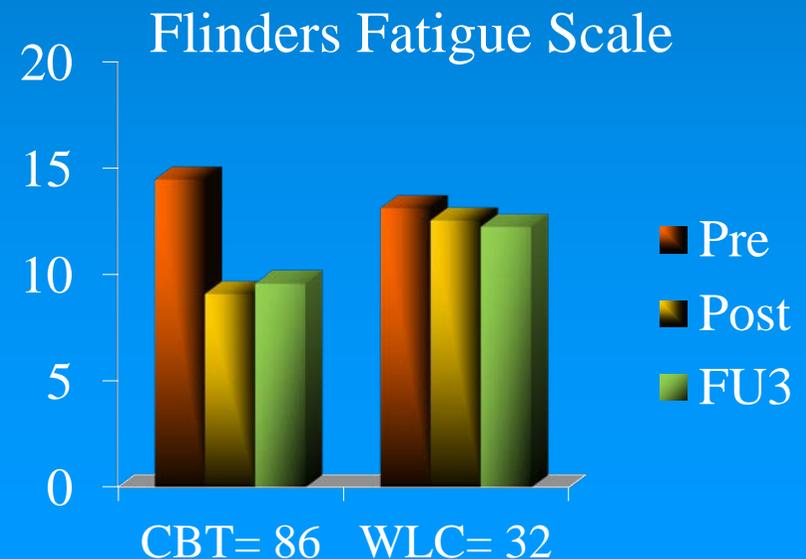
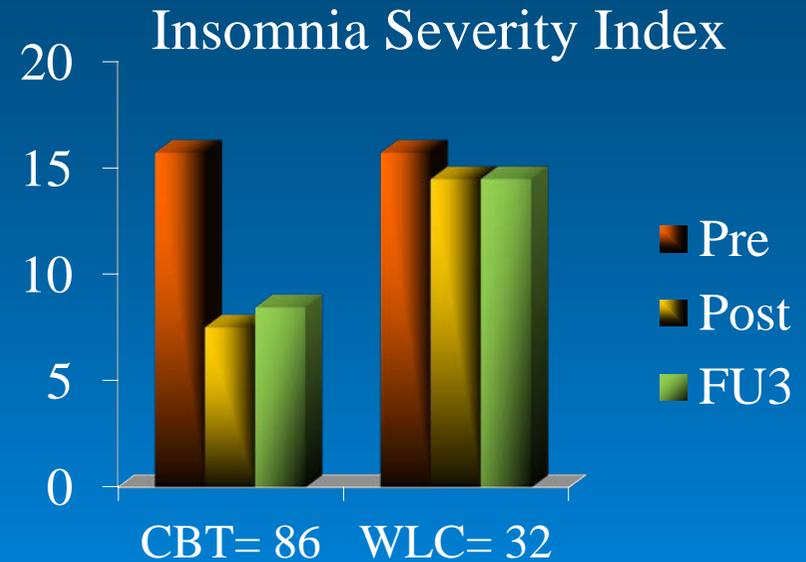
Effects of Psychological Interventions for Insomnia in the General Adult Population and Among Older Adults (pooled results form RCTs)

Outcomes	General Adult	Older Adults	
	CBT-I	CBT-I	Multicomponent Behavioral or BBT
Insomnia Severity Index*	-5.15 [-7.13, -3.16]; Moderate SOE	-3.60 [-2.13, -5.07]; Low SOE	Insufficient
Sleep Onset Latency (min)	-12.70 [-18.23, -7.18]; Moderate SOE	-9.98 [-16.48, -3.48]; Low SOE	-10.43 [-16.31, -4.55]; Low SOE
Wake time After Sleep Onset (min)	-22.33 [-37.44, -7.21]; Moderate SOE	-26.96 [-35.73, -18.19]; Moderate SOE	-14.90 [-22.66, -7.14]; Low SOE
Total Sleep Time (min)	14.24 [2.08, 26.39]; Moderate SOE	NS; Low SOE	Insufficient

SOE = strength of evidence; NS = no statistically significant difference between groups

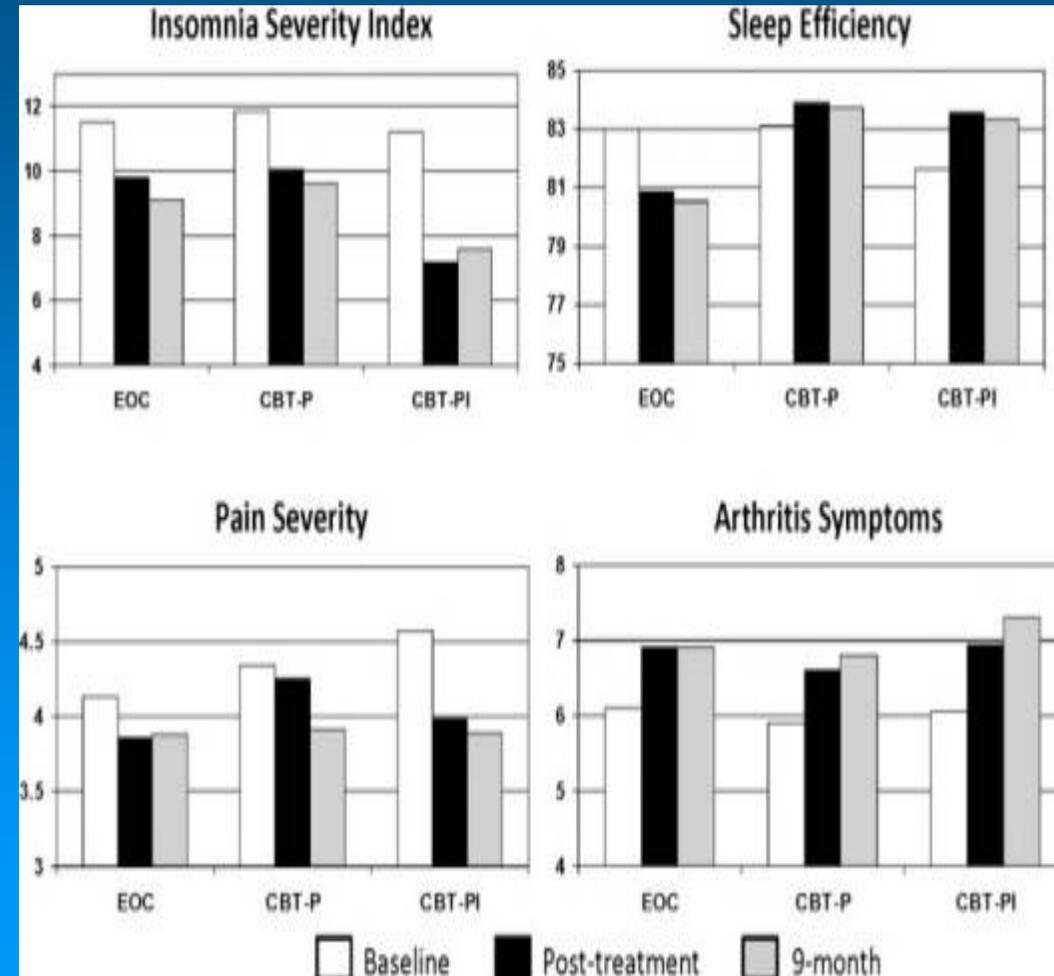
Treatment of Cormobid Insomnia

- Sample: 118 older adults (63W, 55M; mean age = 63.8 y/o) with sleep-maintenance insomnia
- Treatment: 4-week group intervention (bedtime restriction, education, cognitive restructuring)
- Outcomes: Significant improvements in timing and quality of sleep as well as on ISI, Fatigue, and WASO.



Treatment of Comorbid Insomnia in Older Adults with Osteoarthritis Pain

- Sample: 367 older adults (78.5 W, mean age = 73.1 y/o) with insomnia comorbid with OA pain
- Treatment: 6 weekly group therapy sessions of CBT for Pain, CBT for Pain and Insomnia, or Education Control; consultations in primary care clinics
- Outcomes: CBT-PI reduced insomnia severity more than CBT-P only and EOC, and increased sleep efficiency more than EOC. CBT-P improved sleep efficiency more but not insomnia severity compared to EOC. No group difference in arthritis symptoms and pain severity.



Past Research on Insomnia and Aging

- Behavioral and pharmacological therapies for insomnia in older adults
- Hypnotic discontinuation in older adults who are chronic users
- Examination of sleep-related beliefs in insomnia
- Effects of insomnia and chronic use of BZD on neuropsychological functioning in older adults

Cognitive-Behavior Therapy for Late-Life Insomnia

Charles M. Morin, Robert A. Kowatch, Theresa Barry, and Esther Walton

Journal of Consulting and Clinical Psychology
1987, Vol. 55, No. 2, 260-262

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0022-006X/87/\$00.75

Stimulus Control and Imagery Training in Treating Sleep-Maintenance Insomnia

Charles M. Morin and Nathan H. Azrin
Nova University

Journal of Consulting and Clinical Psychology
1988, Vol. 56, No. 5, 748-753

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0022-006X/88/\$00.75

Behavioral and Cognitive Treatments of Geriatric Insomnia

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Nathan H. Azrin
Nova University

Psychology and Aging
1989, Vol. 4, No. 3, 290-294

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0882-7974/89/\$00.75

Sleep Patterns and Aging: Comparison of Older Adults With and Without Insomnia Complaints

Charles M. Morin and Sandy E. Gramling
Medical College of Virginia/Virginia Commonwealth University

Psychology and Aging
1993, Vol. 8, No. 3, 463-467

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0882-7974/93/\$3.00

Dysfunctional Beliefs and Attitudes About Sleep Among Older Adults With and Without Insomnia Complaints

Charles M. Morin, Jackie Stone, David Trinkle, James Mercer, and Stephanie Remsberg

Behavioral and Pharmacological Therapies for Late-Life Insomnia

A Randomized Controlled Trial

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SLEEP DISTURBANCE IS A PREVALENT problem in late life. Between 12% and 25% of healthy seniors report chronic insomnia.

Context Insomnia is a prevalent health complaint in older adults. Behavioral and pharmacological treatments have their benefits and limitations, but no placebo-controlled study has compared their separate and combined effects for late-life insomnia.

Objective To evaluate the clinical efficacy of behavioral and pharmacological therapies, singly and combined, for late-life insomnia.

Design and Setting Randomized, placebo-controlled clinical trial, at a single academic medical center. Outpatient treatment lasted 8 weeks with follow-ups conducted at 3, 12, and 24 months.

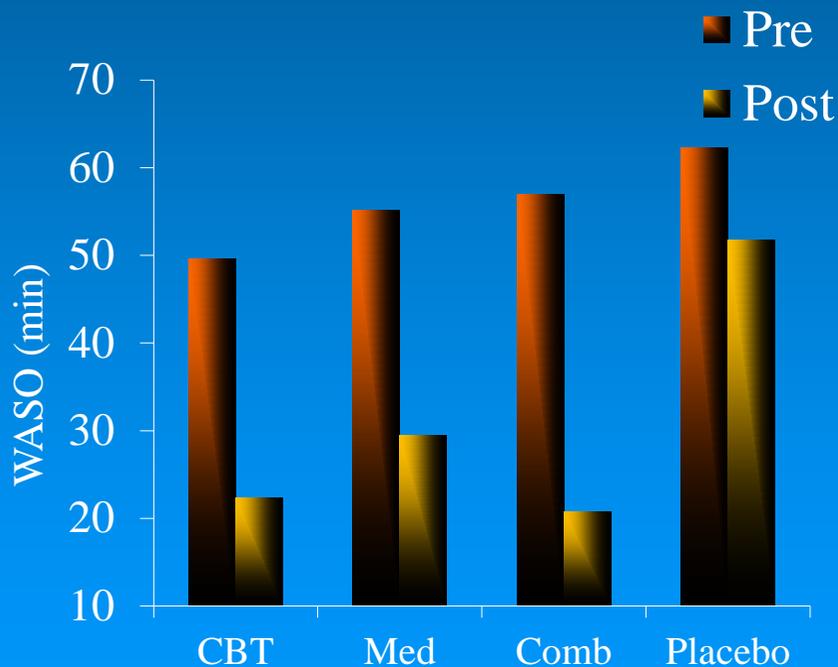
Subjects Seventy-eight adults (50 women, 28 men; mean age, 65 years) with chronic and primary insomnia.

Sample Characteristics

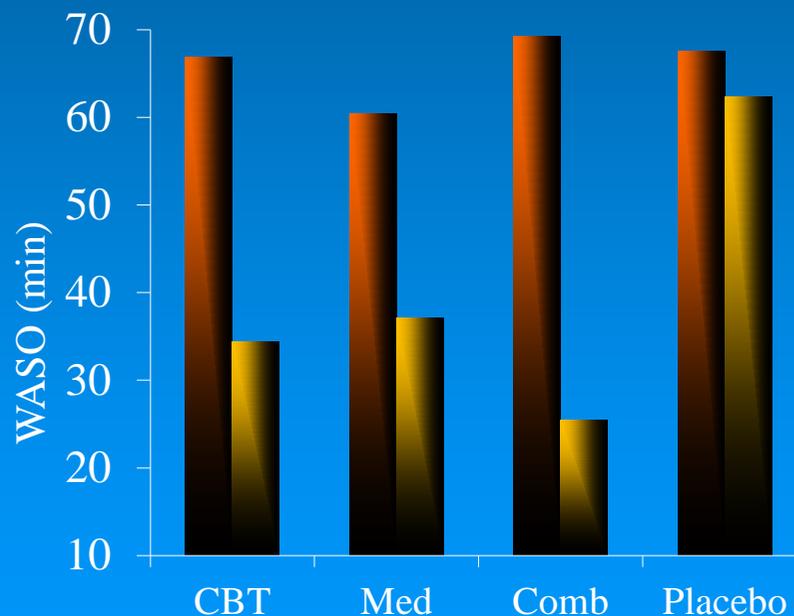
- 78 adults (50 women; mean age, 65 y/o \pm 6.9 years)
- Met criteria for persistent “primary” insomnia (DSM)
- No major medical or psychiatric disorders but 50%+ reported stable comorbid medical conditions (HTN)
- Average insomnia duration 16.8 years, majority of participants (62.8%) reported mixed sleep-onset and maintenance insomnia
- 60 of 78 (76.9%) with current/past hypnotic use

Magnitude of Sleep Changes on Sleep Diaries and Polysomnography

Sleep Diary



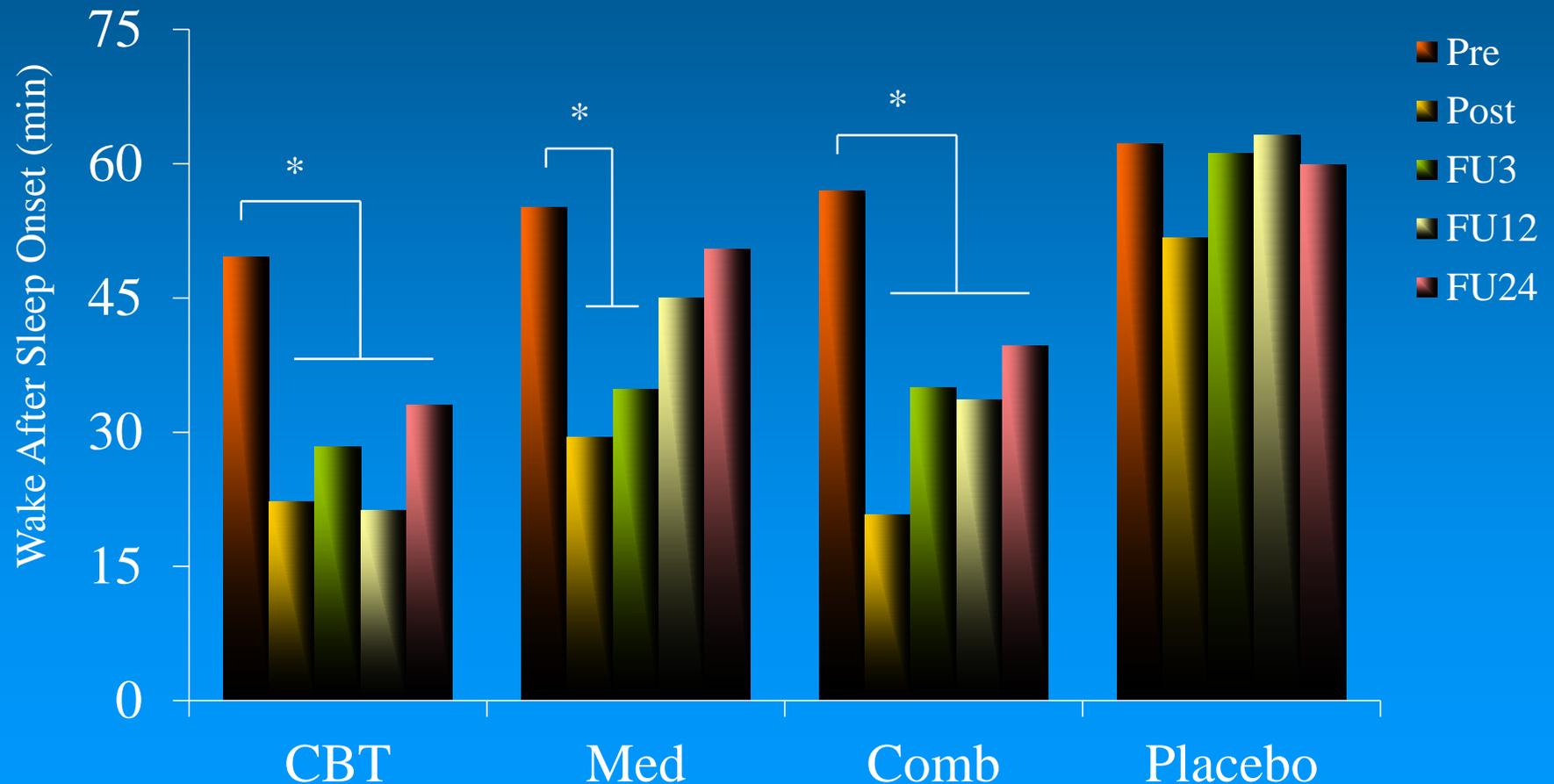
Polysomnography



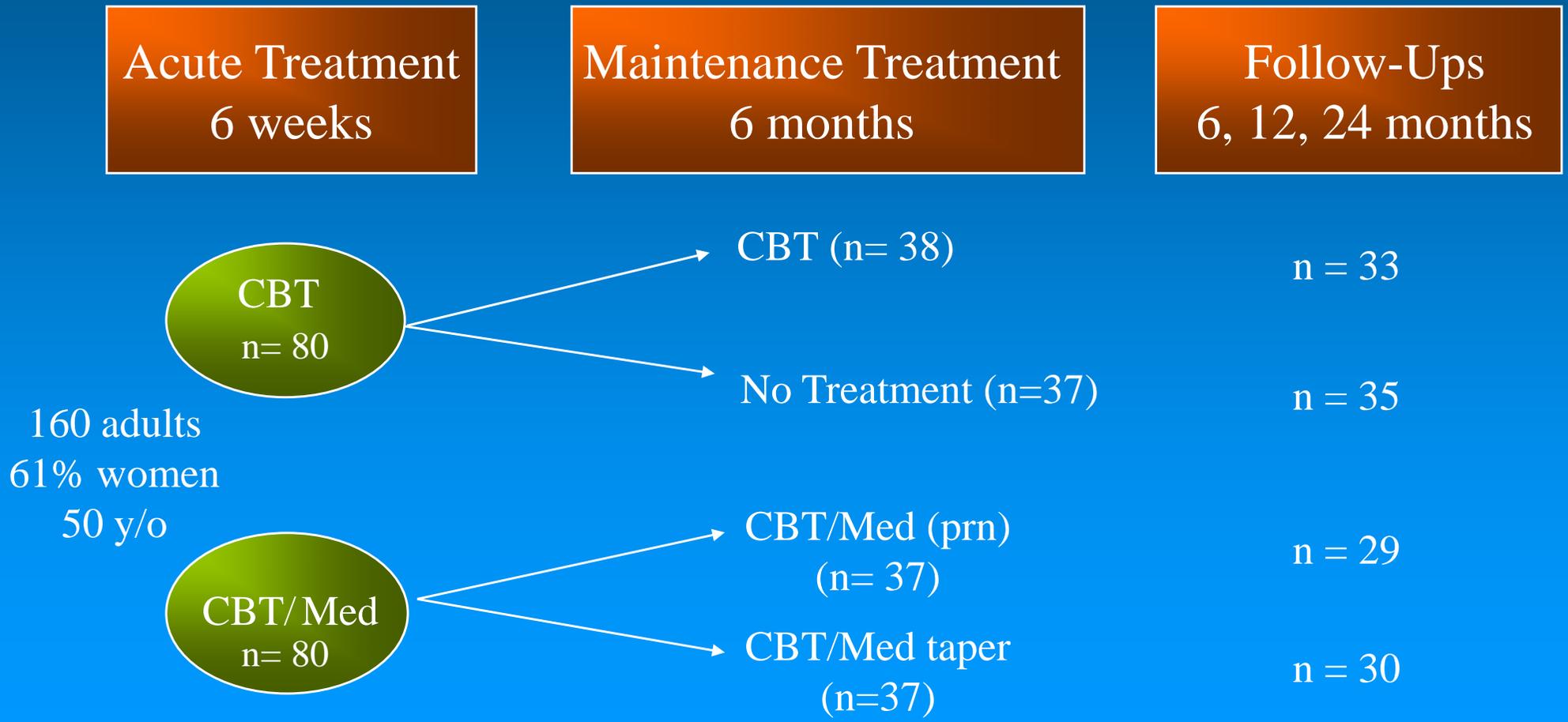
CBT = Med = Comb > Placebo, $p < .01$

CBT, Medication, and Combined Therapies

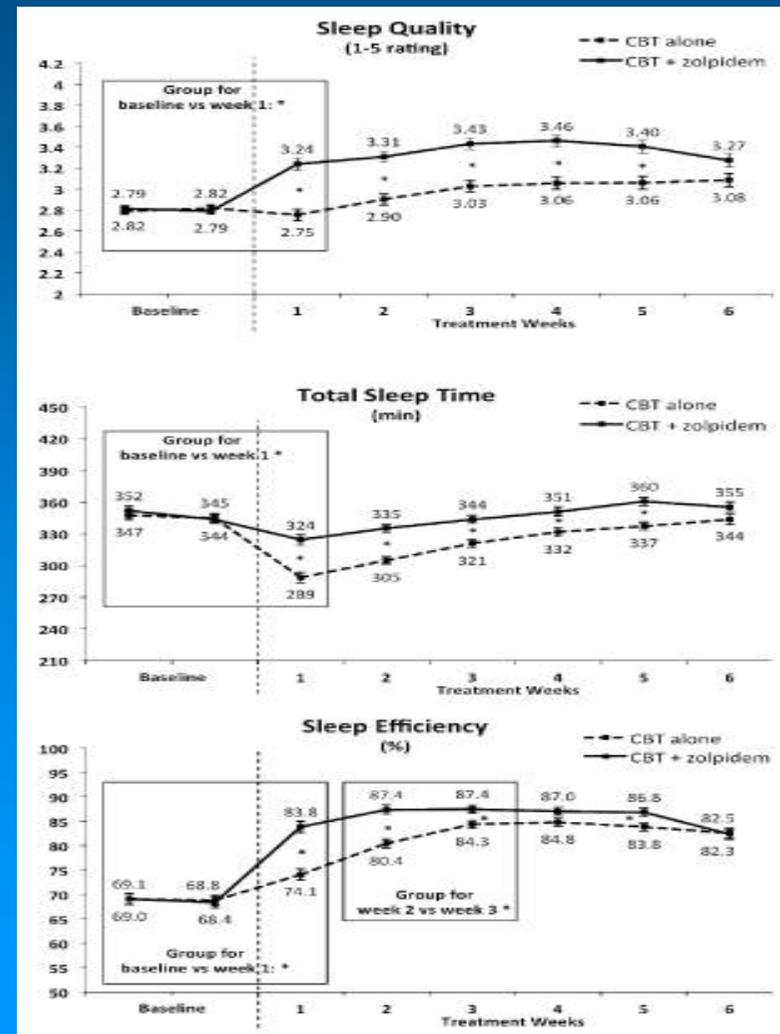
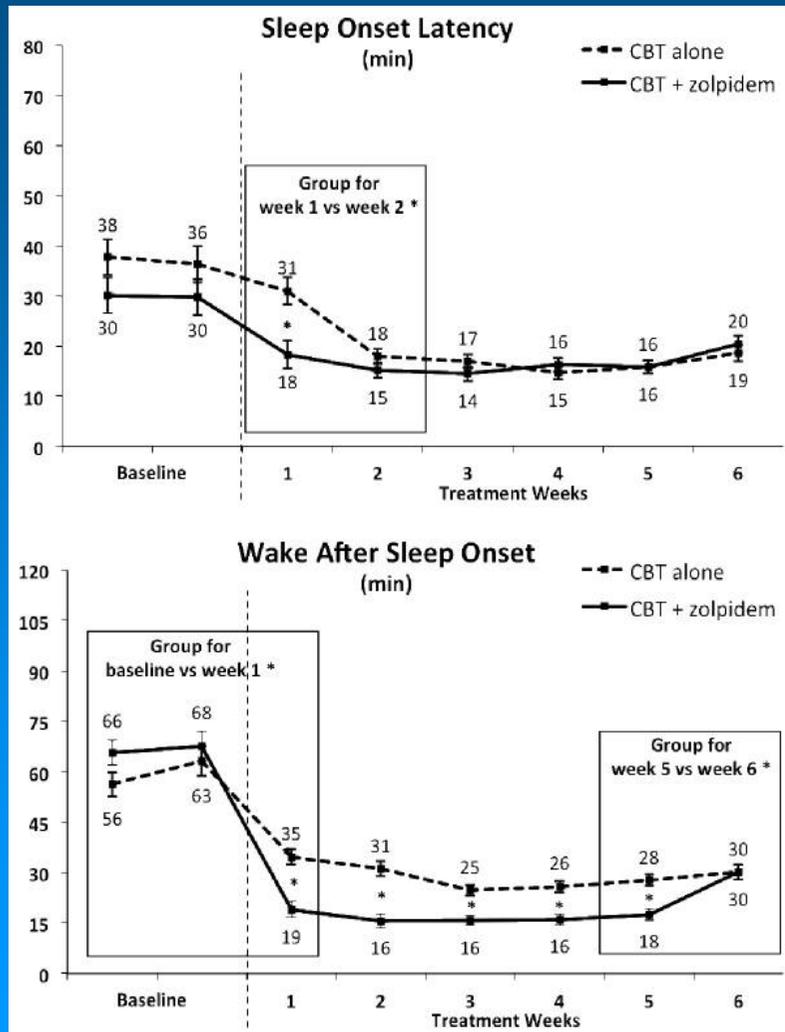
(N = 78 older adults, mean age 65 y/o)



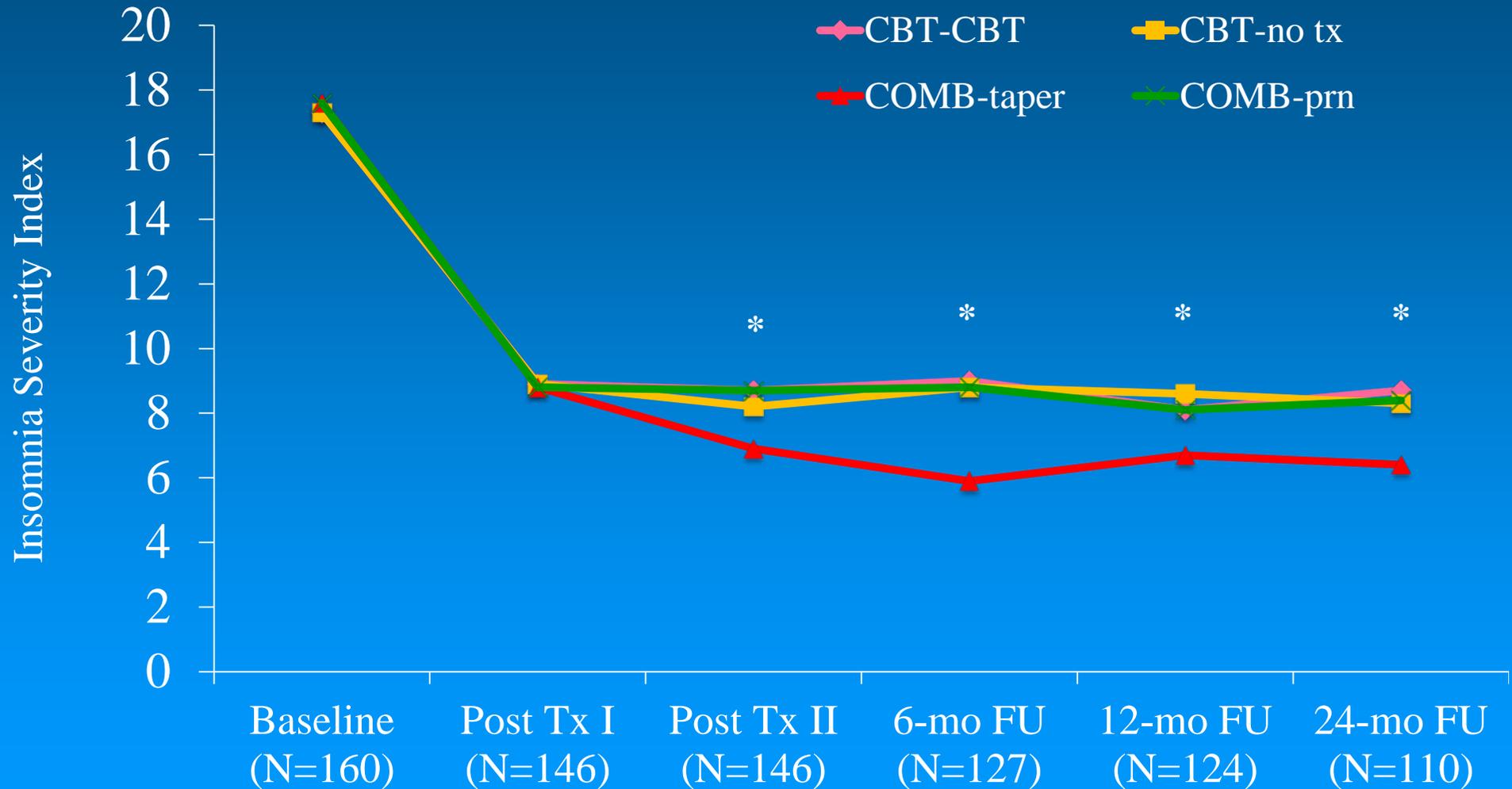
Combined and Maintenance Therapies for Insomnia



Speed and Trajectory of Changes



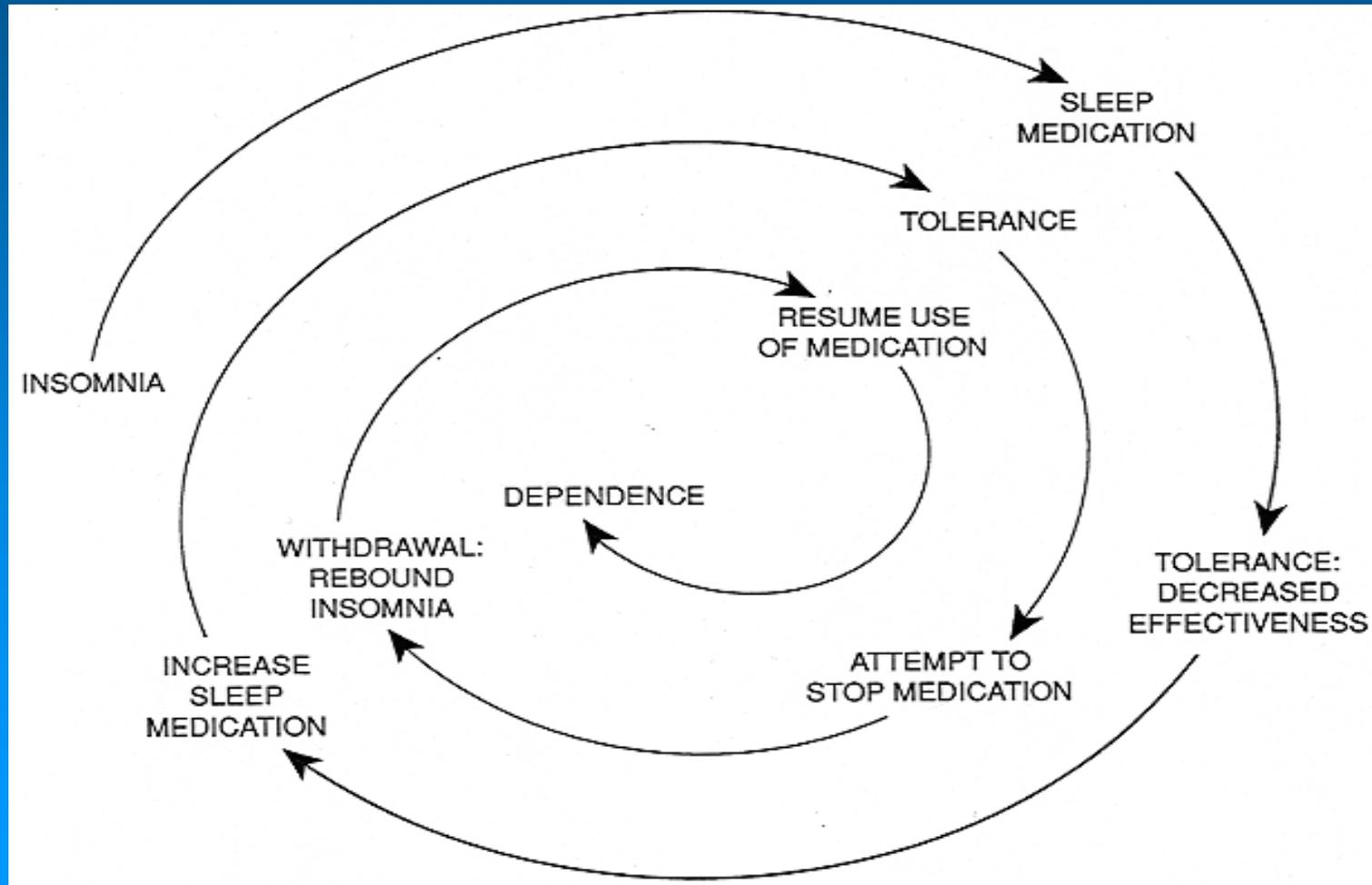
Long-term follow-ups



Combined/Sequential Therapies

- Potential advantages
 - Combines the rapid action of medication and the durability of CBT
- Disadvantages
 - Risk for attribution of sleep improvements to medication alone
 - May undermine compliance with CBT and the development of beneficial self-management skills
 - Risk of dependency on medication

Hypnotic-Dependent Insomnia



Randomized Clinical Trial of Supervised Tapering and Cognitive Behavior Therapy to Facilitate Benzodiazepine Discontinuation in Older Adults With Chronic Insomnia

Charles M. Morin, Ph.D.

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Bernard Guay, M.D.

Monelly Radouco-Thomas, M.D.

Jacinthe Leblanc, B.C.P.P.

Annie Vallières, Ph.D.

Objective: This study evaluated the effectiveness of a supervised benzodiazepine taper, singly and combined with cognitive behavior therapy, for benzodiazepine discontinuation in older adults with chronic insomnia.

Method: Seventy-six older adult outpatients (38 women, 38 men; mean age of 62.5 years) with chronic insomnia and prolonged use (mean duration of 19.3 years) of benzodiazepine medication for sleep were randomly assigned for a 10-week intervention consisting of a supervised benzodiazepine withdrawal program (N=25), cognitive behavior therapy for insomnia (N=24), or supervised withdrawal plus cognitive behavior therapy (N=27). Follow-up assessments were conducted at 3 and 12 months. The main outcome measures were benzodiazepine use, sleep parameters, and anxiety and depressive symptoms.

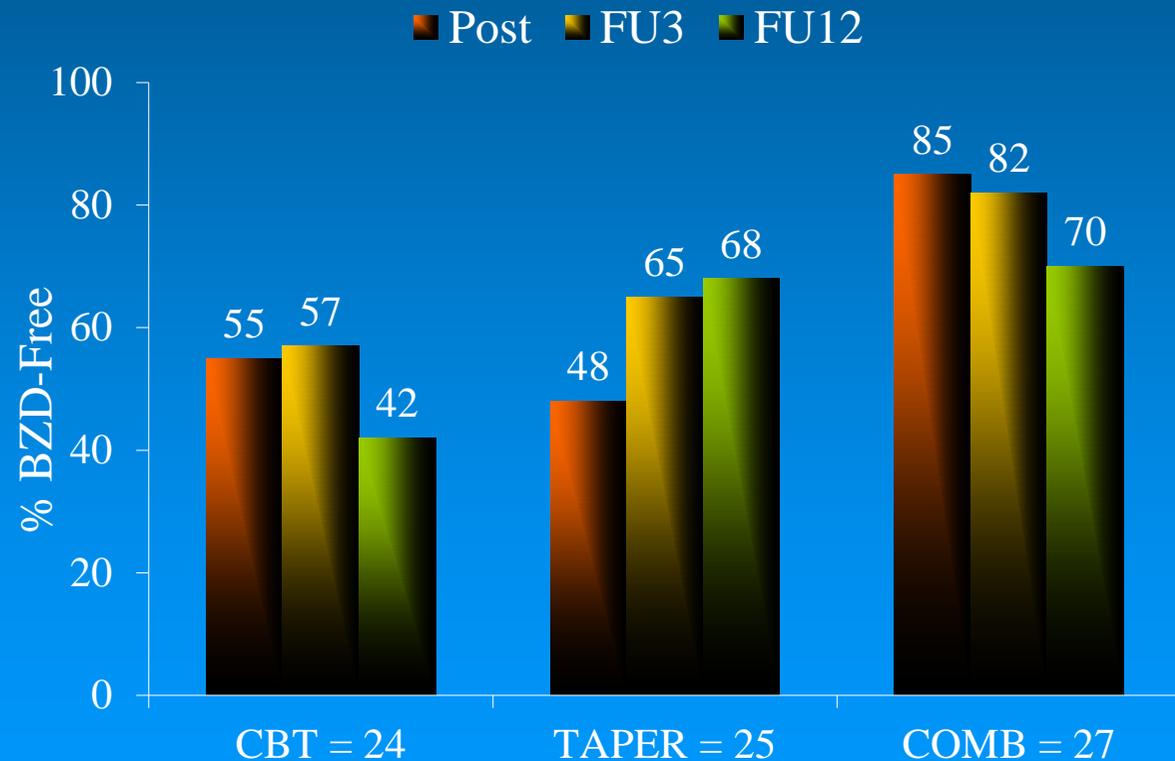
Results: All three interventions produced significant reductions in both the quantity (90% reduction) and frequency (80% reduction) of benzodiazepine use, and 63% of the patients were drug-free within an average of 7 weeks. More patients who received medication taper plus cognitive behavior therapy (85%) were benzodiaz-

epine-free after the initial intervention, compared to those who received medication taper alone (48%) and cognitive behavior therapy alone (54%). The patients in the two groups that received cognitive behavior therapy perceived greater subjective sleep improvements than those who received medication taper alone. Polysomnographic data showed an increase in the amount of time spent in stages 3 and 4 sleep and REM sleep and a decrease in total sleep time across all three conditions from baseline to post-treatment. Initial benzodiazepine reductions were well maintained up to the 12-month follow-up, and sleep improvements became more noticeable over this period. No significant withdrawal symptoms or adverse events were associated with benzodiazepine tapering.

Conclusions: A structured, time-limited intervention is effective in assisting chronic users of benzodiazepine medication to discontinue or reduce their use of medication. The addition of cognitive behavior therapy alleviates insomnia, but sleep improvements may become noticeable only after several months of benzodiazepine abstinence.

CBT and Discontinuation of Chronic Benzodiazepine Use

- Sample: 76 older adults (38W, 38M; mean age of 62.5 y/o)
- BZD Use: 6.7 nights/wk, 10 mg diazepam equivalent, 12 years duration of use
- Treatment: 10-week CBT, Taper, CBT + Taper
- Outcomes: Significant reductions in quantity (90%) and frequency (80%) of use. Addition of CBT associated with improved sleep

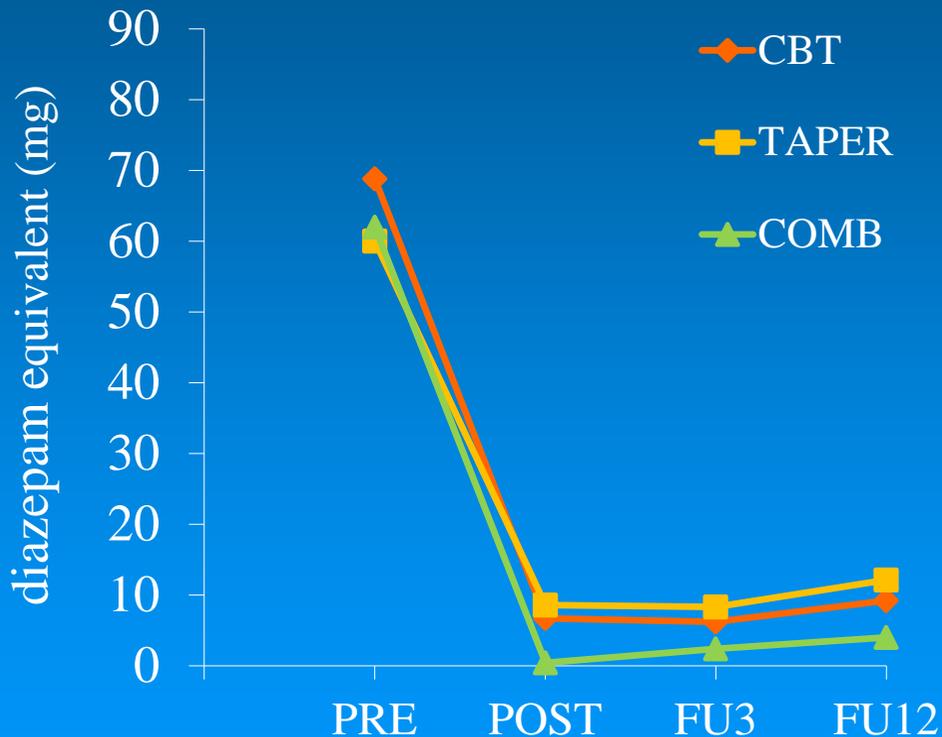


Post: Comb > Taper = CBT, $p < .01$;

FU: Time, $p < .01$; G and Group X Time, n.s.

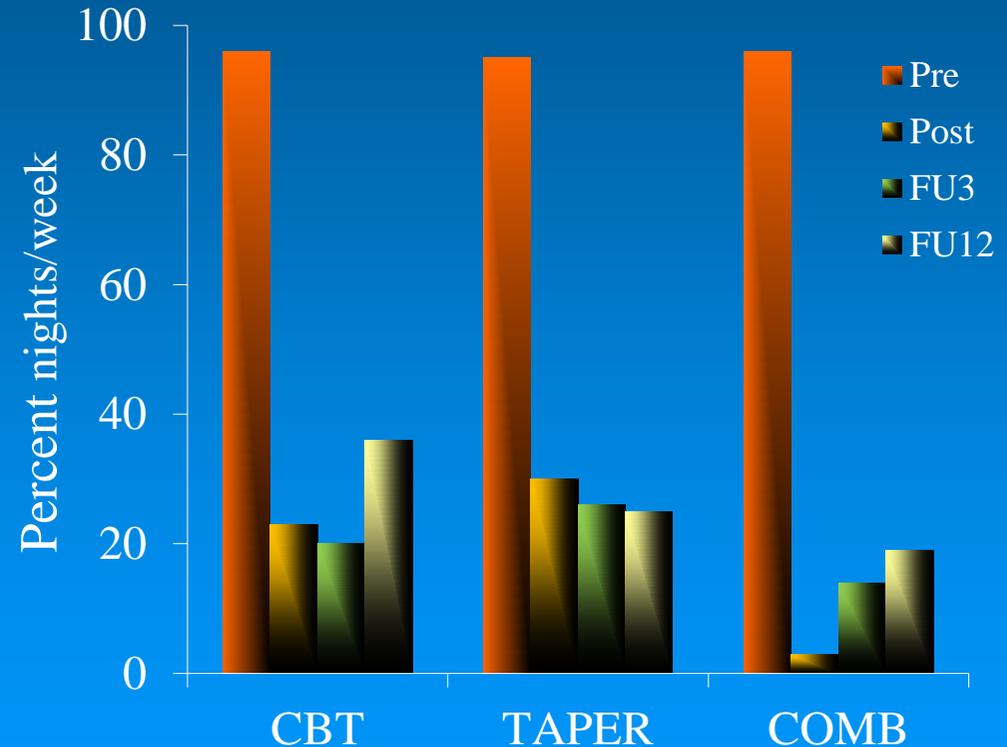
Quantity and Frequency of BZD Use

Quantity of Medication Use

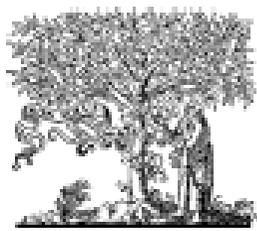


Significant effect for Time ($p < 0.001$) with overall **90% reduction** across groups
 No Group or G x T interaction
 Pre/Post: Time, $p < .05$; Post/FUs: n.s.

Frequency of Use



Significant effect for Time ($p < 0.001$) with overall **80% reduction** across groups at post
 Comb < Taper = CBT, $p < .01$; Time effect
 Post/FU12, $p < .01$



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Behaviour Research and Therapy 43 (2005) 1–14

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Long-term outcome after discontinuation of benzodiazepines for insomnia: a survival analysis of relapse

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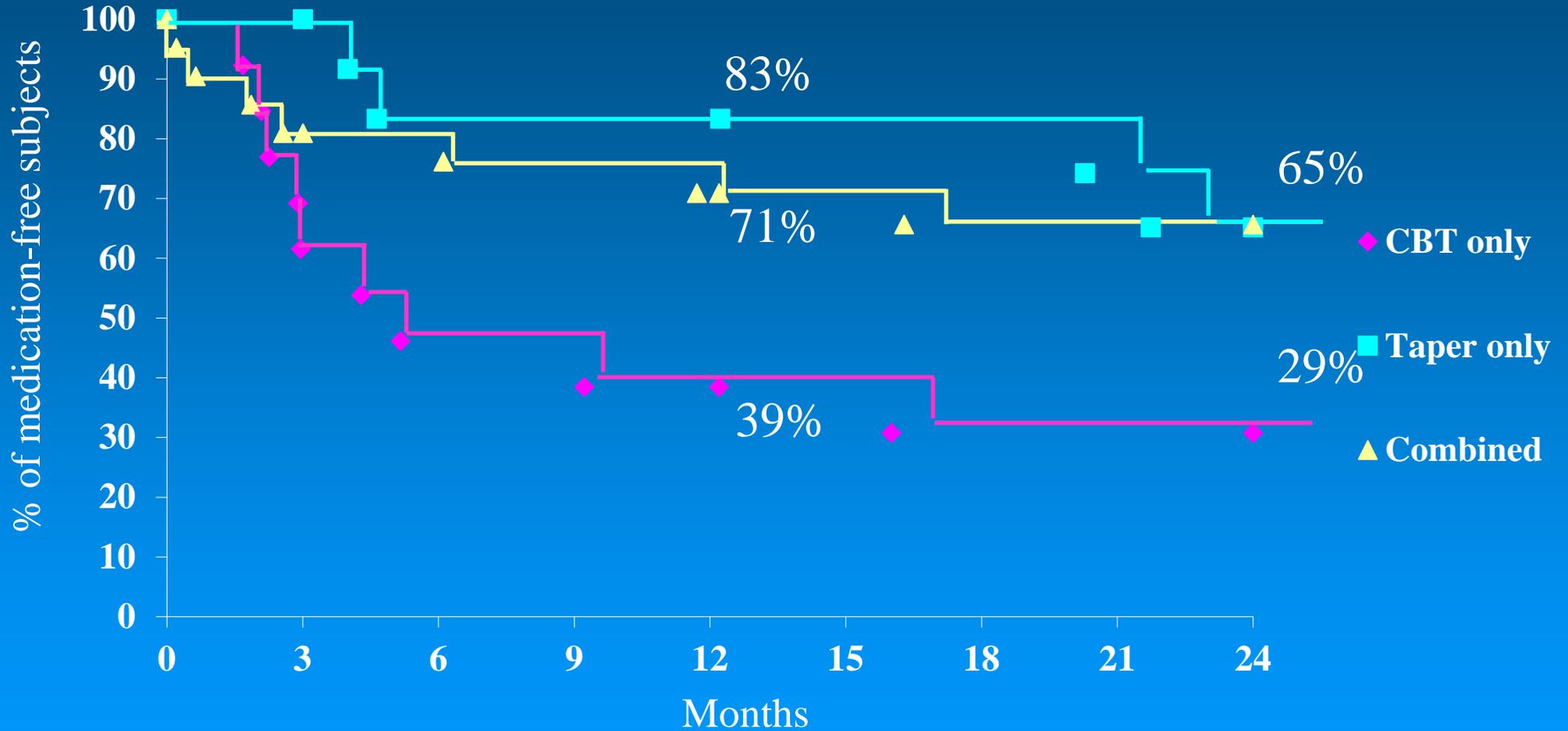
Abstract

Discontinuation of benzodiazepine (BZD) treatment for insomnia can be a difficult task. Cognitive-behavior therapy (CBT) for insomnia, combined with a supervised medication taper, can facilitate withdrawal but there is limited evidence on long-term outcome after discontinuation. The objective of this

Survival Analysis

- Of the 48 patients who were medication-free at posttreatment, 20 (42%) relapsed during the next 2 years:
 - 69% (9/13) in CBT
 - 31% (4/13) in Taper
 - 33% (7/21) in Combined
- Mean survival time
 - 8.5 months for CBT
 - 18.6 months for Taper
 - 12.6 months for Combined
- Predictors of relapses
 - More time to d/c medication, psychological distress/ anxiety, and insomnia severity;
 - age, gender, duration of insomnia or BZD use, types BZD not related to outcomes.

Survival Analysis



Probability of relapse using Kaplan-Meier product-limit method (Log-rank test), $p = .00385$

Post-hoc log-rank tests: Comb vs. CBT, $p < .05$; Taper vs. CBT, $p < .05$; Comb vs. Taper, n.s.

Key Points/Conclusions

- Insomnia is a significant public health problem with negative impact on physical/mental health and cognitive functioning in aging
- Strong evidence that CBT is effective and produces sustained sleep improvements in older adults, yet outcome is not optimal
- Mixed evidence whether there is an added value to combining medication with CBT for chronic insomnia; need to be cautious when evaluating risk/benefits ratio in older adults
- A systematic taper with CBT can facilitate hypnotic withdrawal
- Important gaps between research evidence and current treatment practices

Future Directions: What Needs to be Done?

- Further research to validate optimal treatment algorithms (with and w/o med) – What should be our first treatment? What to do with non-responders? Can we reverse morbidity?
- Greater focus on personalized therapies based on patient's preferences and insomnia phenotypes
- Further validation of abbreviated treatment delivery models – group, telephone, Internet, apps
- More efficient and judicious use of e-health technology to disseminate new knowledge to end users
- Greater focus on public health education/prevention model
- Cost-benefits and cost-effectiveness studies

Acknowledgements

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- Students/trainees/technologists: Denise Jarrin, Janet Cheung, Ivy Chen, Simon Beaulieu-Bonneau, Émilie Fortier-Brochu, Cristina Perrozo, Manon Lamy, Sonia Petit, Amélie Rochefort, Olivier Hudon
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