# IN SOMNIA: EVIDENCE FOR PHARMACOLOGICAL AND NON PHARMACOLOGICAL THERAPIES

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### FACULTY/PRESENTER DISCLOSURE

#### **Faculty: Norah Vincent**

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# MITIGATING POTENTIAL BIAS

NO DISCUSSION OF RESTED

#### **OBJECTIVES**

- 1. Learn what constitutes Cognitive Behavioral Therapy for Insomnia (CBT-i)
- 2. Learn about barriers to use of CBT-i in clinical practice
- 3. Learn about resources for CBT-i

## **SLEEP PROBLEMS ARE COMMON**



1/3 sleep < 7 hours per night

Evolve into Insomnia Disorder (10-15%)



#### INSOMNIA: TWO PROCESS MODEL OF SLEEP



Borbély, A. A. A two-process model of sleep regulation. Hum. Neurobiol., 1982, 1: 195-204.CAS PubMed Web of Science®Google Scholar

### **CV-19 IMPACTS ON PROCESS S**



## CV-19 IMPACTS ON PROCESS C

More time indoors (less bright sunlight)

More evening screen time\*

More electronics in bedroom\*



Duncan, M. J., Kline, C. E., Rebar, A. L., Vandelanotte, C., & Short, C. E. (2016). Greater bedand wake-time variability is associated with less healthy lifestyle behaviors: A crosssectional study. *Journal of Public Health*, 24(1), 31-40.

Hours

### PRACTICE GUIDELINES FOR INSOMNIA DISORDER

**American College of Physicians**: CBT-i as the initial treatment (GRADE: strong, moderate-quality evidence)

Medication only considered after a discussion of harms, benefits, and costs and only when CBT-I is unsuccessful (GRADE: weak, low-quality evidence)

American Academy of Sleep Medicine (GRADE: strong, moderate-quality evidence)

British Association for Psychopharmacology Consensus Statement

**Australian Sleep Association** 

**European Sleep Research Society** 

### **REMISSION RATES WITH CBT-I**

Defined as:

- < 30 minutes to fall asleep
- < 30 minutes of wake time during sleep period

#### Remission rates Figure S25. ISI/Diary-determined remission rate, post treatment differences, CBT-I vs. control

The second se	CBT	1	Contr	oi lo		Risk Difference	Risk Difference		
Study or Subgroup	Events	Total	Events	Total	Weight	MI-H, Random, 95% CI	M.H. Random, 95% CI		
5.1.1 In-person, one-on-one delivery									
Currie 2004 (in-person)	6	15	1	17	2.9%	0.32 [0.05, 0.58]			
Dvake 2019	41	49	16	48	4.4%	0.50 [0.33, 0.67]			
Edinger 2009	14	19	5	20	2.7%	0.49 [0.21, 0.76]		In-person I:	
Harvey 2015	15	22	2	19	3.2%	0.58 (0.34, 0.82)			
Jacobs 2004	8	14	2	14	2.2%	0.43 [0.11, 0.75]			
Jansson-Frojmark 2012 (J Clin Psycho Med Settings)	4	17	0	15	3.5%	0.24 [0.02, 0.45]			
Savard 2014 (in-person)	54	70	35	76	4.8%	0.31 [0.16, 0.46]			
Smith 2015	32	43	20	48	4.0%	0.33 [0.14, 0.52]			
Talbot 2014	11	27	0	15	3.8%	0.41 10.21 0.611			
Tador 2014	10	15	2	13	2.3%	0.51 10.20 0.821			
Wadey 2013	2	21		10	4.7%	0101009028			
1341 2006	-	10	-	17	2.0%	0.751.0.01 0.570			
Subtotal (955, CB		332	-	312	40.8%	0 36 10 28 0 441	•		
Total quanto	204		0.5			and the state of the state			
Listemente Tard = 0.01 Chil = 10.00 df = 11.02 = 0.	204		60						000/111
Heterogenety, racr = 0.01, Chr = 18.29, Gr = 11 (F = 0.)	00), 11 = 43								3.3% higher
Test for overall effect 2 = 8.37 (P < 0.00001)									
5 1 2 Group delivers									
S. L.2 Group derivery		~~		-					
Cume 2000	13	32	2	28	3.9%	0.33 [0.14, 0.53]			
Espie 2007	32	107	17	94	0.0%	0.12 (0.00, 0.23)			
Fleming 2014	38	73	7	40	4.5%	0.35 [0.18, 0.51]		Croup	
Irwin 2014	27	50	- 5	25	3.7%	0.34 [0.13, 0.55]		GIOUD	
Lovato 2014	33	76	1	29	5.2%	0.40 [0.27, 0.53]		· · ·	
Morin 1999	10	18	-4	18	2.4%	0.33 [0.03, 0.63]			
Sandlund 2017	41	82	18	71	4.8%	0.25 [0.10, 0.39]			
Savard 2005	12	23	2	28	3.4%	0.45 [0.22, 0.68]			
Subtotal (95% CI)		461		333	33.5%	0.31 [0.22, 0.40]	•		
Total events	206		56				- 1980 (		
Heterogeneity: Tau# = 0.01: Chi# = 14.52; df = 7 /P = 0.0	4) 17 = 52%								
Test for overall effect 7 = 6.95 (P × 0.00001)	-92	-							
5.1.3 Self-help delivery									
Currie 2004 (self-bein)		15		17	3.2%	0141009 0371			
Jamainy 2012	11	45			5.2%	0.22 0.09 0.351			
Subtotal (95% CD		60		61	8.5%	0.20 10 09. 0 321	•		
Takal autoka					0.0.0	area faraat arta1	-	l Selt_hein	
Total events	14								
Heterogeneity: Tau* = 0.00, Chi* = 0.35, df = 1 (P = 0.55)	); I* = U%							-	
Test for overall effect 2 = 3.43 (P = 0.0006)									
5.1.4 Internet delivery									
bitroph 2017						0.1010.02.04.0			
Piorsch 2017	17	40		0.2	4.0%	0.28 [0.12, 0.44]			
Hitterband 2009	10	22	0	22	3.19%	0.13 [0.53, 0.92]			1 C C C C C C C C C C C C C C C C C C C
Filterband 2012		14	- 2	14	2.2%	0.36 [0.04, 0.68]		Internet_ )elive	red
Suppose (sole Ci)		01		340	10.7%	eren fersefersal			<b>U</b>
Total events	40								
Heterogeneity: Tau* = 0.06; Chi* = 13.08; df = 2 (P = 0.0	01); 1*= 85	76							
rest or overas effect 2 = 2.85 (P = 0.004)									
5 1 5 Wideo delivery									
Second 2011 Address								Video Delivere	
Savard 2014 (Video)	38	57	35	78	4.5%	0.21 [0.04, 0.37]		l video-Delivere	C
annorm (acar ci)		-57	1	10	4.5%	0.51 [0.04, 0.37]			
Total events	38		35						
Heterogeneity: Not applicable									
Test for overall effect $Z = 2.43$ (P = 0.01)									
5.1.6 Telephone delivery									
Amedi 2013	11	15		15	2.1%	0.33 [-0.00, 0.87]		alanhona_ )ali	varad
Subtodal (95% CI)		15		15	2.1%	0.33 [-0.00, 0.67]			
Total events	11		6						
Heterogeneity: Not applicable									
Test for overall effect Z = 1.96 (P = 0.05)									
Total (95% CI)		1006		895	100.0%	0.33 [0.28, 0.39]	•		
Total events	513		192						
Heterogeneity: Tau# = 0.01; Chi# = 58.68, df = 26 (P = 0)	0003); (*=	56%					the she is she she		
Test for overall effect Z = 11.40 (P < 0.00001)							-0.5 -0.25 0 0.25 0.5 Environ Control Environ CDD		
Test for subgroup differences: Chi# = 6.95 df = 5 dP = 0	225 1 = 26	11%					Favoura Constal Favoura CB11		
*Currie 2004 (in-person and self) uses same control data									

Savard 2014 (in-person and video) uses same control data

### **EFFECTIVENESS OF CBT-I**

#### Insomnia vs Control (no comorbidities)

Insomnia severity: Insomnia and no comorbidities

igure S40. ISI-determined insomnia severity, post treatment differences, CBT-I vs. control										
	C	BT-I		C	ontrol			Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	
7.3.1 In-person, one-o	on-one d	elivery	y							
Taylor 2014	5.56	5.21	15	11.38	4.72	14	9.9%	-1.14 [-1.93, -0.34]		
Subtotal (95% CI)			15			14	9.9%	-1.14 [-1.93, -0.34]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 2.81	(P = 0	.005)							
7.3.2 Group delivery										
Lovato 2014	7.53	4.45	76	14.47	4.95	29	17.6%	-1.50 [-1.98, -1.03]		
Subtotal (95% CI)			76			29	17.6%	-1.50 [-1.98, -1.03]	-	
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 6.19	(P < 0	.00001	)						
7.3.3 Internet delivery	<i>'</i>									
Bernstein 2017	9.8	5.85	43	15.3	4.62	45	18.5%	-1.04 [-1.48, -0.59]		
Blom 2016	8.3	4.1	68	11.8	4.4	65	21.8%	-0.82 [-1.17, -0.46]		
Hagatun 2019	8.73	5.13	77	15.75	5.1	65	21.3%	-1.36 [-1.73, -1.00]		
Ritterband 2009	6.59	4.45	22	15.5	4.45	22	11.0%	-1.97 [-2.70, -1.24]		
Subtotal (95% CI)		-	210			197	72.6%	-1.22 [-1.62, -0.82]	-	
Heterogeneity: Tau* =	0.11; Ch	11 <sup>#</sup> = 9.	70, df =	= 3 (P =	0.02);	I= 699	%			
Test for overall effect:	Z = 5.98	(P < 0	.00001	)						
Total (05% CI)			204			240	100.0%	1 26 [ 1 66 0 06]		
Total (95% CI)			301			240	100.0%	-1.20 [-1.00, -0.90]	-	
Heterogeneity: Tau* =	0.08; Ch	11 <sup>-</sup> = 11	1.51, df	= 5 (P :	= 0.04)	); I= = 57	70		-2 -1 0 1 2	
lest for overall effect:	∠ = 8.14	(P < 0	.00001	)					Favors CBT-I Favors Control	

#### Insomnia vs Control (comorbid psychiatric conditions)

Insomnia severity: Insomnia and comorbid psychiatric conditions

Figure S41. ISI-determined insomnia severity, post treatment differences, CBT-I vs. control

	(	CBT-I		C	ontrol			Std. Mean Difference Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI		
7.1.1 In-person, one-	on-one (	deliver	У								
Harvey 2015	6.45	5.49	30	13.9	5.32	28	39.6%	-1.36 [-1.93, -0.78]			
Jungquist 2010	4	4	19	13	6	9	18.5%	-1.86 [-2.81, -0.91]			
Talbot 2014	8	3.95	27	16.6	3.83	15	24.7%	-2.16 [-2.95, -1.36]			
Taylor 2015	14.7	8.5	11	22.6	3.1	8	17.2%	-1.11 [-2.10, -0.11]			
Subtotal (95% CI)			87			60	100.0%	-1.61 [-2.05, -1.16]	◆		
Heterogeneity: Tau <sup>2</sup> =	0.04; C	hi² = 3	.79, df =	= 3 (P =	0.28);	$ ^{2} = 219$	Хо				
Test for overall effect:	Z = 7.08	6 (P < 0	0.00001	)							
Total (95% CI)			87			60	100.0%	-1.61 [-2.05, -1.16]	•		
Heterogeneity: Tau <sup>2</sup> =	0.04; C	hi <b>=</b> 3	.79, df=	= 3 (P =	0.28);	$ ^{2} = 21$					
Test for overall effect:	Z = 7.08	6 (P < 0	0.00001	)					Favors CBT-L Favors Control		
Test for subgroup diff	erences	: Not a	pplicat	ole							

#### Insomnia vs Control (comorbid medical conditions)

#### Insomnia severity: Insomnia and comorbid medical conditions

Figure S42. ISI-determined insomnia severity, post treatment differences, CBT-I vs. control

0									
	(	CBT-I		C	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
7.2.1 In-person, one-on-one delivery									
Jansson-Frojmark 2012 (J Clin Psycho Med Settings)	10.5	4.4	10	18.1	5.3	15	9.2%	-1.48 [-2.40, -0.56]	
Pigeon 2012	6	4.65	6	13	3.4	4	4.6%	-1.50 [-3.02, 0.02]	
Savard 2014 (in-person)	5.76	4.11	70	11.09	5.05	76	17.7%	-1.15 [-1.50, -0.80]	
Smith 2015	8.87	5.54	45	11.68	6.92	47	16.7%	-0.44 [-0.86, -0.03]	
Subtotal (95% CI)			131			142	48.2%	-1.00 [-1.52, -0.47]	-
Heterogeneity: Tau <sup>2</sup> = 0.16; Chi <sup>2</sup> = 8.68, df = 3 (P = 0.03)	; P = 65'	%							
Test for overall effect: Z = 3.72 (P = 0.0002)									
7.2.2 Group delivery									
Dirksen 2007	14.38	5.31	34	16.31	5.03	38	15.8%	-0.37 I-0.84, 0.101	
Subtotal (95% CI)			34			38	15.8%	-0.37 [-0.84, 0.10]	-
Heterogeneity: Not applicable									
Test for overall effect: Z = 1.55 (P = 0.12)									
7.2.3 Self-help delivery									
Bjorvatn 2018	13.6	5.5	81	14.1	5.8	83	18.4%	-0.09 [-0.39, 0.22]	
Subtotal (95% CI)			81			83	18.4%	-0.09 [-0.39, 0.22]	<b>+</b>
Heterogeneity: Not applicable									
Test for overall effect: Z = 0.56 (P = 0.57)									
7.2.6 Video delivery									
Savard 2014 (video)	8.13	4.14	56	11.09	5.05	76	17.7%	-0.63 F0.980.271	
Subtotal (95% CI)			56			76	17.7%	-0.63 [-0.98, -0.27]	◆
Heterogeneity: Not applicable									-
Test for overall effect; Z = 3.48 (P = 0.0005)									
Total (95% CI)			302			339	100.0%	-0.67 [-1.04, -0.30]	◆
Heterogeneity: Tau <sup>a</sup> = 0.17; Chi <sup>a</sup> = 26.26, df = 6 (P = 0.0)	002); I <sup>2</sup> =	77%							
Test for overall effect: Z = 3.53 (P = 0.0004)									-2 -1 U 1 2
Test for subgroup differences: Chi# = 10.52, df = 3 (P =	0.01), P	= 71.59	ж						Favora Cont-1 Favora Conta of

guie offer loca dotorin	mou n		nu oc	, tong	, poo		unoni		10.0011101
		CBT-I		•	Control			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
3.2.1 In-person, one-on-one del	livery								
dinger 2005 (Sleep hygiene)	36.3	15.6	16	38.36	13.97	26	29.7%	-0.14 [-0.76, 0.49]	
dinger 2007	39.32	13.89	68	51.4	14.4	9	24.7%	-0.86 [-1.57, -0.15]	
dinger 2009	26.5	20.49	41	29.7	20.87	40	45.6%	-0.15 [-0.59, 0.28]	
Subtotal (95% CI)			125			75	100.0%	-0.32 [-0.73, 0.09]	-
leterogeneity: Tau <sup>2</sup> = 0.05; Chi <sup>2</sup>	= 3.07,	if = 2 (P	= 0.22	); I <sup>#</sup> = 35	5%				
fest for overall effect: $Z = 1.54$ (F	P = 0.12								
otal (95% CI)			125			75	100.0%	-0.32 [-0.73, 0.09]	-
leterogeneity: Tau <sup>2</sup> = 0.05; Chi <sup>2</sup>	= 3.07,	if = 2 (P	= 0.22	); I <sup>#</sup> = 35	5%				
est for overall effect: Z = 1.54 (F	P = 0.12								-2 -1 U 1 2 Eavors CBT-L Eavors Control
est for subaroup differences: N	lot appli	able							Favora Contra Favora Control

\*Edinger 2005 usual care and sleep hygiene data pooled

Edinger et al., 2021 Jn Clin Sleep Med, 17, 263-298.

### COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA (CBT-I)

6 evidence based techniques:

- Sleep Restriction Therapy
- Stimulus Control
- Relaxation training
- Cognitive Therapy
- Education
- Self-Monitoring of Sleep
- (Sleep Hygiene)

Not a one-time delivery Focuses more on behavior than cognition Requires 4-8 weeks

### **1. SLEEP RESTRICTION**

- 1. Agree on a fixed wake up time
- 2. Determine average total sleep time
- 3. Schedule a sleep window that accommodates both
- 4. Open the window after 3-7 nights, in  $\frac{1}{2}$  hr increments
- 5. Stop when sleep problems return



Sleep < 4 hours/night Untreated sleep apnea Mania/hypomania Parasomnias Poorly controlled seizure disorder Rotating shift workers

### **SLEEP RESTRICTION EXAMPLE**

Bob: wake up time 6:00am

Current total sleep time: 5 hours

Calculate Sleep Window

	Days 1-3	Days 4-6	Days 7-10
Bedtime	1:00am	12:30am	12:00am
Wakeup Time	6:00am	6:00am	6:00am

### **SLEEP RESTRICTION SCHEDULE**

Day	Bedtime	Wakeup Time	Result
Days 1-3			
Days 4-6			
Days 7-9			
Days 10-12			

## 2. STIMULUS CONTROL

Limit pairing wakefulness with the bedroom



- Electronics
- Office work
- Arguing with spouse
- Eating
- Television
- Reading

Safety behaviors

> Go to bed when sleepy Get out of bed when awake

## **3. RELAXATION TRAINING**

Hypnotherapy (Worriers)

Progressive Muscle Relaxation (Type A person)

Abdominal Breathing

Imagery induced

(Meditation)



# 4. COGNITIVE THERAPY

Calm the mind leading up to sleep period

- 1. Worry Schedule
- 2. Consider nature of worry, perspective-take



Face rather than avoid problems Thought suppression interferes with sleep

#### **WORRY SCHEDULE**

Worry/ concern	Possible Solutions	How can I accept this better?	Did this help?

#### **COGNITIVE THERAPY EXAMPLES**

1. Awareness and perspective taking

"If I don't fall asleep now, I am going to have to cancel my plans tomorrow"

-Perspective: I may not sleep at all tonight, and I'll be tired and achey tomorrow. Best to go ahead with plans, and remind myself to look forward to sleepiness the next night.



## **5. EDUCATION ABOUT SLEEP**

Range of sleep per night varies

People differ in their ability to detect sleep/wake



	Total Sleep Time	Sleep Efficiency	Light	Deep
Actiwatch	.87	.30		
Basis	.84	.26	.30	.27
Fitbit	.97	.21		
Misfit	.76	20	.31	.20
Withings	.84	.17	.34	.36

Mantua, J.; Gravel, N.; Spencer, R.M.C. Reliability of Sleep Measures from Four Personal Health Monitoring Devices Compared to Research-Based Actigraphy and Polysomnography. *Sensors* 2016, *16*, 646.



#### **EDUCATION ABOUT SLEEP**

Healthy sleepers require 20-30 minutes to fall asleep and to fully awaken in am

Healthy sleepers awake 4-5 times during night (and often more)\*

You can develop insomnia by attempting to force yourself to sleep longer than your body requires

You can't force sleep

Don't over-attribute fatigue/mood/concentration problems to sleep

Develop tolerance for sleep loss

# 6. SELF-MONITORING SLEEP DIARY

#### Name

Week Beginning

#### **MEASURING THE PATTERN OF YOUR SLEEP**

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
What time did you wake up this morning?							
What time did you get out of bed this morning?							
At what time did you go to bed last night?							
How long did it take you to fall asleep (minutes)?							
How many times did you wake up during the night?							
How long were you awake during the night (in total)?							
About how long did you sleep altogether (hours/minutes)?							
How much alcohol did you take last night?							



#### PROVIDER BARRIERS TO USE OF CBT-I IN CLINICAL PRACTICE

Providers lack familiarity and are unsure about effectiveness

Difficulty describing treatment in compelling manner

Tend to rely on medication and sleep hygiene education (>70%)

View insomnia as a symptom and prioritize treatment of anxiety, depression, pain

Believe patients will be reluctant

Believe that patients will bring up (but they don't)

< 10% of patients referred for CBT-I

#### **PROVIDER BARRIERS TO CLINICAL PRACTICE**

Providers think patients want/expect medication (30%)

Anticipate non-compliance with CBT-I (21%)

Too difficult to motivate patients for CBT-I (49%)

NOT SUPPORTED:

Patients view CBT-I as healthier and preferable to medication

Very few are offered CBT-I

Most learn about CBT-I through self-research

#### PATIENT BARRIERS TO CLINICAL PRACTICE

52% of patients in UK think sleeping pills are only treatment

Should be able to self-manage

Hard to find time for CBT-I

Techniques more challenging than taking a pill

Persuasive advertising of pharmaceutical companies ("magic bullet")

HOWEVER, 70-90% of those that complete CBT-i significantly improve

### MANITOBA: COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA



Holmqvist, Vincent, & Walsh (2013). Sleep Medicine, 15, 187-195.

Vincent, & Lewycky (2009). Sleep, 32, 807-815.

#### Clinical Health Psychology program: (fax: 204 787-3755)

Private Practice Psychologists (List of providers: mps.ca)







#### SLEEP CALCULATOR TO ASSIST WITH CHOICE OF BEDTIME



#### **PROGRESS WITH SLEEP EFFICIENCY AND SLEEP QUALITY**



#### WEBSITES AND APPS



#### WORKBOOKS





### MANITOBA: COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA



Holmqvist, Vincent, & Walsh (2013). Sleep Medicine, 15, 187-195.

Vincent, & Lewycky (2009). Sleep, 32, 807-815.

#### Group Therapy (6 weeks)

#### Individual Therapy

- parasomnias
- CPAP adherence
- Circadian rhythm sleep-wake

#### Consultation



#### END

