Sleeping your way to better mental health
Sleep Matters

What we’ll cover today..

1. Sleep and mental health are intimately linked
2. CBT for insomnia is the best long term treatment
3. Sleepio is an evidence-based digital CBT-I programme
4. A case study: Sleepio & Manchester Self-Help Services
5. Q&A
1. Sleep and mental health are tightly linked.

Long term poor sleep (insomnia) increases the risk of anxiety and depression, and interferes with recovery.
Sleep problems are the most common symptoms of poor mental health

% of Adults with a score 2+ on neurotic symptoms

- Sleep problems
  - Total: 28%
  - Men: 23%
  - Women: 33%
- Worry
  - Total: 19%
  - Men: 17%
  - Women: 21%
- Depression
  - Total: 11%
  - Men: 10%
  - Women: 12%
- Anxiety
  - Total: 9%
  - Men: 8.5%
  - Women: 9.5%

Insomnia is more common in anxiety and depression, and is persistent if untreated

1 in 3 adults has poor sleep\(^1\)

1 in 10 adults has insomnia\(^1\)

Sleep problems 3+ nights per week, >3 months, despite adequate opportunity to sleep; negative daytime impact\(^2\)

7 in 10 adults with depression has insomnia\(^3\)

75% will have insomnia a year later

Frequently reported negative daytime impacts:

• Lack of energy, malaise
• Low mood, irritability
• Poor concentration
• Reduced productivity
• Relationship problems
• Inability to stay awake

“When you have insomnia, you're never really asleep, and you're never really awake. Nothing’s real. Everything’s far away. Everything’s a copy of a copy.”

From the movie *Fight Club* (1999)
Based on the novel by Chuck Palahniuk
But what’s the direction of causality in a ‘vicious circle’ of insomnia?

- Emotions: Worry, anxiety, despair, depression, social detachment
- Beliefs: ‘I will never sleep again’, brooding over consequences, unrealistic expectations
- Insomnia & hyperarousal: Racing of negative thoughts, physiological excitement (muscle tension, raised BP, brain hyperactivity)
- Physical / functional problems: Tiredness, inability to concentrate, poor work performance, stress-related illness
- Unhealthy sleep behaviours: Excessive time in bed, irregular sleep schedules, naps during the day, caffeine, alcohol
But what’s the direction of causality in a ‘vicious circle’ of insomnia?

“I will never sleep again”
Brooding over consequences
Unrealistic expectations

Beliefs about poor sleep

Insomnia & hyper-arousal
Racing of negative thoughts
Physiological excitement

Unhealthy sleep behaviours
Excessive time in bed
Irregular sleep schedules
Naps during the day
Caffeine, alcohol

Emotional disorders
Worry, anxiety
Despair, depression
Social detachment

Physical / functional problems
Tiredness
Inability to concentrate
Poor work performance
Stress-related illness
A growing body of research points to poor sleep as a causal factor in mental ill-health

Compared to people with no sleep problems, people with insomnia are twice as likely to develop depression\(^1,2\)

Patients with untreated sleep problems are less likely to respond to psychological therapy for anxiety or depression, and more likely to relapse\(^3,4\)

Treating sleep problems in people with depression and insomnia has led to better outcomes than treating depression alone\(^5,6\)

Causal mechanisms implicated are altered emotional processing and cognitive & physical hyperarousal\(^2\)

2. For chronic sleep problems, NICE recommends CBT for insomnia
What causes insomnia?

**Predisposing factors**

**Precipitating factors, or triggers**

**Perpetuating factors**

What causes insomnia?

**Predisposing factors**

...family history, ‘worrying’ disposition
...risk factors - female sex, older age, lower SES

**Precipitating factors, or triggers**

...psychosocial stressors - new job, relationship problems
...environmental stressors - new baby, new home
...medical stressors - development of illness

**Perpetuating factors**

...maladaptive thoughts, anxiety, depression
...unhelpful behaviours - caffeine, alcohol, napping

Symptom relief vs. cure

“Both hypnotics and psychological/behavioral methods are effective to treat insomnia in the short-term and the latter have significantly more durable effects when active treatment is discontinued.”

Risks associated with hypnotics
... next day sleepiness
... tolerance, dependence, withdrawal effects – including rebound insomnia.

Memory impacts?

Current NICE clinical advice for insomnia treatment

1. Short-term
   - Identify underlying cause & co-morbidities
   - Advise on good sleep hygiene
   - Consider short-term hypnotic drug

2. Long-term
   - Cognitive and behavioural interventions

- last revised July 2009

http://cks.nice.org.uk/insomnia#!management
Cognitive Behavioural Therapy for Insomnia (CBT-I): a toolkit

CBT-I ingredients

- Paradoxical intention
- Cognitive control
- Cognitive restructure
- Relaxation ...
- Stimulus control & 1/4h rule
- Sleep hygiene
- Sleep restriction

CBT-I: preferred by patients, effective long & short term

CBT-I improves sleep in c.70% of insomnia patients

.. as effective as prescription medications for brief treatment

Effects maintained after up to 2 years follow-up

.. well beyond the end of active treatment

Minimal contact or self-directed CBT typically yields smaller, but significant effects

Most patients prefer non-drug therapy

Evidence-based delivery channels for CBT-I

Examples..

One to one
Morin et al. (2009) JAMA

Brief therapy
Buyss et al. (2011) Arch Int Med

Group therapy

Large groups, day long
Swift et al. (2011) J Sleep Res

Telephone
Arnedt et al. (2013) SLEEP

Self-help booklets
“The challenge for CBT-I is no longer to prove its credentials but to punch its weight.

For at least a decade, CBT should have been a contender as the treatment of first choice for insomnia. In reality, however, it has had very little impact on the high volume of insomnia in patient care. Indeed, it has amounted to little more than a patchy cottage industry.”

Espie
*SLEEP* 2009 32(12)
3. Sleepio is an evidence-based digital CBT-I programme
What is Sleepio?

A digital sleep improvement program, proven in a placebo-controlled trial to help improve poor sleep

Created by Prof Colin Espie and featuring interactive Cognitive Behavioural Therapy (CBT) techniques

Delivered by ‘The Prof’, your virtual sleep expert

Fully automated but tailored to individual needs and goals

Espie et al. (2012) SLEEP 35(6)
The Digital Sleepio Toolkit (CBT+)

Friendly, accessible, personalised, low cost, scalable
What is Sleepio? Introducing the Prof
http://vimeo.com/62441150
24 hour support: now via mobile..
Inside the programme...

Daily sleep diary, support from the community, expert sessions, articles

iOS App ‘Help Me Now’ techniques to help you sleep

1. Get Ready
   - Your Lifestyle
   - Your Thoughts
   - Your Bedroom

2. Your Schedule
   - Racing Mind

3. Your Schedule
   - Your Thoughts

4. Your Schedule
   - Your Lifestyle

5. Depending on individual needs:
   - Cognitive re-structure
   - Autogenic training
   - Imagery
   - Mindfulness
   - Paradoxical intention

6. Graduate!
   - Review goals
   - Congratulate
   - Reinforce motivation

• Formulation
• Goal setting
• Diary keeping
• Motivational contract

• Sleep hygiene
• Progressive relaxation
• Thought checker

• Sleep hygiene (schedule)
• Stimulus control
• Sleep restriction
Gold standard clinical evidence

Placebo-group randomised trial published in journal SLEEP

Results show that Sleepio can help long term poor sleepers:

- ...fall asleep up to 54% faster
- ...reduce night time awakenings by up to 63%
- ...boost daytime energy and concentration by up to 58%

45% average reduction in depression, anxiety & stress measures

High rates of engagement

- 87% would recommend to a friend
- 80% completed the program

Source: Espie et al. (2012) A randomised, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application.
Response to Sleepio

THE LANCET
“A proven intervention for sleep disorders using the internet… maybe we can look forward to a future where patients can look online for a good night’s sleep: from www to zzz.”

lifehacker
“A truly personal program to help you sleep better.”

nature
“About as effective as CBT delivered in person.”

theguardian
“Pioneering.”
4. A case study: Sleepio & Manchester Self Help Services eTherapy Team
Aim: to evaluate Sleepio in 50 SHS patients with sleep problems seeking help for common mental disorders

Launched: 3rd March 2014

Eligible patients? Suitable for Step 2
.. Access to the internet, check email at least weekly
.. Score 1+ on PHQ9, Q3* & interested in improving sleep
.. exclude pregnant women, shift workers, unstable health

Yes? Internal transfer to Nick Baldwin, Sleepio Co-ordinator
.. Baseline ‘insomnia severity index’ (ISI)
.. Weekly monitoring phone calls, including minimum dataset

Training workshop for eTherapy co-ordinators at launch

Access codes for patients, and redeem instructions

Training manual for PWPs/etherapy team to accompany programme

Sleepio Clinic – enables tracking of patients’ progress

71% of patients met anxiety or depression caseness when they started Sleepio

Mental health
% meeting caseness

- Depression, PHQ-9 >9: 67%
- Anxiety (GAD-7) >7: 52%

Sleep Quality
Sleep Condition Indicator (SCI)

- Very poor: 43%
- Poor: 42%
- Fair: 14%
- Good: 1%

Note: Based on 79 patients who redeemed Sleepio voucher codes
Patients have demonstrated high engagement with the Sleepio programme

<table>
<thead>
<tr>
<th>Completed 6 week program</th>
<th>In progress</th>
<th>Inactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>59%</td>
<td>9%</td>
<td>32%</td>
</tr>
</tbody>
</table>

47 SHS patients have completed the first core 6 sessions, improving their average sleep efficiency from 48% to 78%

7 users are progressing through the programme

25 users have not accessed Sleepio in the last 2 weeks (8 of these have completed 4 or more sessions)

<table>
<thead>
<tr>
<th>Baseline sleep efficiency</th>
<th>48%</th>
<th>42%</th>
<th>39%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last recorded sleep efficiency</td>
<td>79%</td>
<td>83%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Note: Based on 79 patients who redeemed Sleepio voucher codes, data to 21st January
Overall significant increases in sleep efficiency

Sleep efficiency is the proportion of time in bed asleep

Note: Based on 47 users with sleep efficiency after every session
Sleep becoming easier, less fragmented and more sustained over time

- **Time to fall asleep, minutes** (Sleep Onset Latency, SOL)
  - S1: 70
  - S2: 43
  - S3: 42
  - S4: 31
  - S5: 26
  - S6: 26

- **Time awake after sleep onset** (Minutes awake during the night)
  - S1: 93
  - S2: 46
  - S3: 45
  - S4: 29
  - S5: 27
  - S6: 26

- **Total sleep time, hours**
  - S1: 4.2
  - S2: 5.6
  - S3: 5.8
  - S4: 5.5
  - S5: 6.0
  - S6: 5.9

Note: n=47; based on Sleepio diary data for users completing Sleepio programme

Sleep restriction, introduced in session 3, uses a reduction in sleep time to help re-set sleep patterns
On average, after session 6, patients were sleeping more soundly — on average they:

<table>
<thead>
<tr>
<th>Fell asleep</th>
<th>Spent</th>
<th>Stayed asleep</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>44 mins</strong> faster</td>
<td><strong>67 mins</strong> less time awake in the night</td>
<td><strong>1h 45 mins</strong> longer</td>
</tr>
</tbody>
</table>

- 63% reduction in sleep onset latency
- 72% reduction in wake time after sleep onset
- 42% increase in time asleep

70 min ➔ 26 min
93 min ➔ 26 min
4.2 hrs ➔ 5.9 hrs

Note: Based on 47 patients who completed the programme
As sleep improved, anxiety and depression fell in parallel (sleep restriction a challenge)

Mean PHQ-9/GAD-7 with standard error bars. Based on 45 patients with outcome data from SHS.
Significant reductions in numbers meeting caseness for insomnia, depression, & anxiety

From assessment to follow-up

Moving to Recovery?
Sleepio 64% vs. national target 50%

Reduction in depression
85% fewer cases based on PHQ-9

Reduction in anxiety
80% fewer cases based on GAD-7

Note: Based on 45 patients with weekly anxiety and depression data after 6 weeks (data collection in progress)
Sleepio has been positively received, both by the provider and service users

“Lack of sleep can severely impact on daily life, and can lead to depression and other issues. Sleepio has been designed to help with the most common types of sleep problems – falling asleep, staying asleep or just getting good quality sleep.”

— Nicky Ledbetter, Self Help Services CEO

“Now I’ve finished I’ve got pretty good control of it I think. The bad sleep is certainly less than it was and I have reduced the dose of my sleeping pills.”

— SHS Service User

Could Sleepio be a ‘trojan horse’ for providing de-stigmatised help for mental health?
Interested in sleep and mental health?
Sign up to Sleepio Clinic for free – weekly research updates, interactive sleep survey, library..

www.sleepio.com/clinic

Please contact me for more information:
sophie@sleepio.com
www.sleepio.com
Questions?
Sleep Matters
What we’ve covered today..

1. Sleep and mental health are intricately linked
2. CBT for insomnia is the best long term treatment
3. Sleepio is an evidence-based digital CBT-I programme
4. A case study: Sleepio & Manchester Self-Help Services

For more information: sophie@sleepio.com
Sign up to Sleepio Clinic for free: www.sleepio.com/clinic
Appendix
Extra slides
## Camden & Islington Voucher Codes

<table>
<thead>
<tr>
<th>Patient ID code</th>
<th>Sleepio Referral Code</th>
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<th>Latest status</th>
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</table>

**Voucher code:**

- Record patient ID and date invited.
- Check status within 10 days.

**Email text:**

Dear {add name},

I'm pleased to invite you to take part in Sleepio, a six-week online sleep improvement programme.

Getting Started with Sleepio

To get started, please use a tablet, PC or Mac computer connected to the internet. You will need to listen to some audio content so please check that the sound is turned on. Please allow 20-25 minutes for session 1.

1. Go to: www.sleepio.com/receive

2. Copy this code into the box labelled 'Voucher code': {{ADD-CODE from list opposite}}

3. Complete the sign up process and take your in-depth sleep test to unlock your first session with The Prof!

This voucher entitles you to free access to the Sleepio programme for up to 12 weeks. If you have any technical problems or queries about accessing the programme, please contact hello@sleepio.com. A more detailed sign up guide is attached.

Your data

When you sign up using the free voucher code above, your progress within the programme will be visible to healthcare professionals at Camden & Islington Psychological Therapies.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
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<td>Staff trial codes</td>
<td>Used by (type in email):</td>
<td><strong>Sign up instructions:</strong></td>
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<td>&quot;Sleepio Access Instructions&quot;</td>
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<tr>
<td>9nkv-zww3</td>
<td></td>
<td>3. Complete the sign up process and take your in-depth sleep test to unlock your first session with The Prof!</td>
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<tr>
<td>evbh-j6dz</td>
<td></td>
<td>To download the instructions for patients, go to Tools &gt; Downloads &gt; Patient instructions.</td>
</tr>
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</table>
Dear {{add name}},

I’m pleased to invite you to take part in Sleepio, a six-week online sleep improvement programme.

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**Your data**
When you sign up using the free voucher code above, your progress within the programme will be visible to healthcare professionals at Camden & Islington Psychological Therapies. This will allow us to support you through the programme. If you would like to change your data privacy settings at any time, you can do so on the ‘My Account’ page.

**Next steps**
Please reply to this email to confirm that you have been able to sign in and start the Sleepio programme. I will be in touch after a few weeks to see how you’re getting on.

Kind regards

{{Sign off}}
What will your patients see when they redeem their code?
First, they’ll visit www.sleepio.com/redeem and enter their voucher code.

Get started with Sleepio

You’re just minutes away from starting Sleepio

Enter your Sleepio voucher code

Enter voucher code

Redeem
Before they sign in, they’ll be advised that a healthcare professional can view their progress.

“The voucher code you entered is from a healthcare provider or research group. Using this code means that a verified professional can view your progress during the Sleepio course. You can change these settings at any time on ‘My Account’ page.”
They can add a tracking device, or just continue on to the initial sleep test.
After their first session, they complete sleep diaries and weekly sessions with The Prof.
How can you view their progress?

www.sleepio.com/clinic
To log in, visit www.sleepio.com/clinic

Sleepio Clinic: sleep medicine resources for professionals and researchers

Request a free account  Log in

Inside the Sleepio Clinic

Stay up-to-date with the latest sleep research.
To see your patients, visit ‘My patients’
By default, patients will appear in the shared Clinic account as soon as they redeem their Sleepio voucher code.

<table>
<thead>
<tr>
<th>Name</th>
<th>Last seen</th>
<th>Sleep Efficiency</th>
<th>Current session</th>
<th>Status</th>
<th>Days until next session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophie Bostock</td>
<td>24/10/2014</td>
<td>88%</td>
<td>Session 6</td>
<td>Completed</td>
<td>Overdue - 118days</td>
</tr>
</tbody>
</table>

Need help? Check out our FAQs or email us on clinic@sleeio.com
Click on each patient’s name to view their latest session, diaries, and case file.
If patients are worried about privacy, once they’ve signed in they can change their settings on their ‘My Account’ page.
At the bottom of the ‘My account’ page, they can add or remove a doctor using a doctor code.

Doctors Beta

The following doctors have access to your Sleepio data:

Name          Organisation  Action
Dr. Sophie Bostock  Home  Remove

Add a doctor

Add a doctor to your account

If you have been given a Doctor Code by your doctor, please enter it here.

Doctor Code

Add doctor
‘CARE’ Approach

Congratulate: Well done on reaching whatever stage you’re at!

Ask: How’s it going? Do you have any questions? Ask MDS questions

Reassure: It’s normal to think or feel the way you do…

Encourage: We know the programme works if you stick with it..