Hypknowledge

Help people get their <u>most, best sleep</u> by making mobile tech, wearables, and smart devices smarter

The Current Problem

There has been a proliferation of devices that measure sleep and display sleep data

<u>But</u>

Such devices and systems do not provide science based, data driven, guidance about

- How to get more sleep, and/or

- What amount (and timing) of sleep is optimal for the individual

Existing "Sleep Coaching" is Limited

- Recommendations are not individually-tailored
- Recommendations are not actionable
- Recommendations are not feasible
- Recommendations are not self-correcting
- Recommendations are just tips

What if your wearable could actually tell you how much sleep you need?

And was driven by an individualized, self-correcting set of algorithms that actually worked and could optimize your sleep?

And what if it talked to the IOT devices around you to provide support?

What is Our Goal?

This is a lot like building a great bathroom scale

- You can tell someone how much they weigh
- But a scale cannot tell them **whether that weight is optimal** for them,
- Or **how to lose or gain weight** if they need to.

Imagine if you had a scale that not only gave you all kinds of information about your weight (and body fat distribution, etc.) but also was able to use that information to optimize a weight loss plan specifically tailored to you. Our system is able to tell people what their ideal weight should be, based on their own data.

The Hypknowledge Approach

<u>Screen for sleep disorders (Screener)</u>

  via an online and/or smart phone based instrument

  Positive results: provide information

<u>Gather sleep data (Tracker)</u>

  via online and/or smart phone sleep diary interface

  via passive trackers (e.g., Fitbit, Sleep Cycle, etc.)

  via voice interface / smart speakers (e.g., Amazon Alexa)

<u>Display data (Reporter)</u>

  In tables and graphs on user page & phone app

<u>Process data (Optimizer)</u>

  via Hypknowledge sleep extension algorithm

  via Hypknowledge sleep optimization algorithm

  <u>Provide recommendations re: sleep scheduling</u>

   via email and texts

   via on-line dashboard

   via voice interface / smart speakers

   via device screens

Presently Developed (2.0)

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Sleep Disorders Symptom Screener

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Presently Developed
Email with PDF of Screener

Subject: FW: FW: Sleep Disorders Screener

SDS-CL-25 (V6)

Thank you for your interest in your sleep health. Thank you for taking the time to complete the screener. A PDF of the screener is attached to this email. The items in the last two columns (highlighted in gray) indicate that you are experiencing one or more symptoms of one or more of 13 sleep disorders. If you have such "positive signs", you may wish to share the PDF of the screener with your primary care provider. Alternatively, or additionally, you may wish to seek out information or specialty care.

For information on sleep disorders, please visit
https://www.sleepfoundation.org/

In order to identify sleep centers in your area, please visit.
http://sleepeducation.org

In order to identify Behavioral Sleep Medicine specialist in your area (those that treat insomnia), please visit
https://cbti.directory/
https://www.behavioralsleep.org/

We hope this information is helpful.
Sleep well

Sleep Disorders Symptom Screener

Presently Developed
On-Line Sleep Diary

Presently Developed
iPhone Sleep Diary
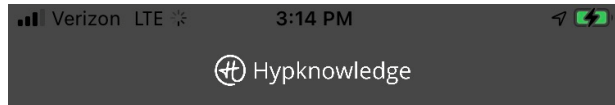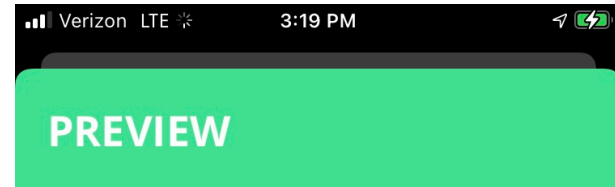
Presently Developed
SMS and Email Notifications
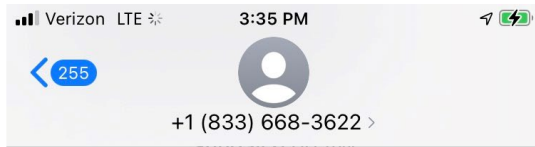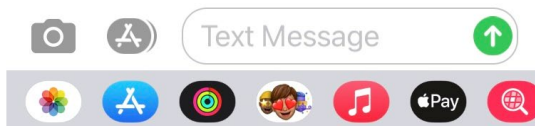
Perlis, Michael L.

To:	Hypknowledge Sleep Manager; mperlis61@gmail.com
Subject:	RE: Diary Reminder

From: Hypknowledge Sleep Manager <notify@hypknowledge.com>
Sent: Tuesday, March 2, 2021 12:05 PM
To: mperlis61@gmail.com
Subject: Diary Reminder

Hello there.

If you have not done so already, please remember to fill out your sleep diary for today.

Thanks.

Presently Developed
Out of Range and Invalid Response Notifications
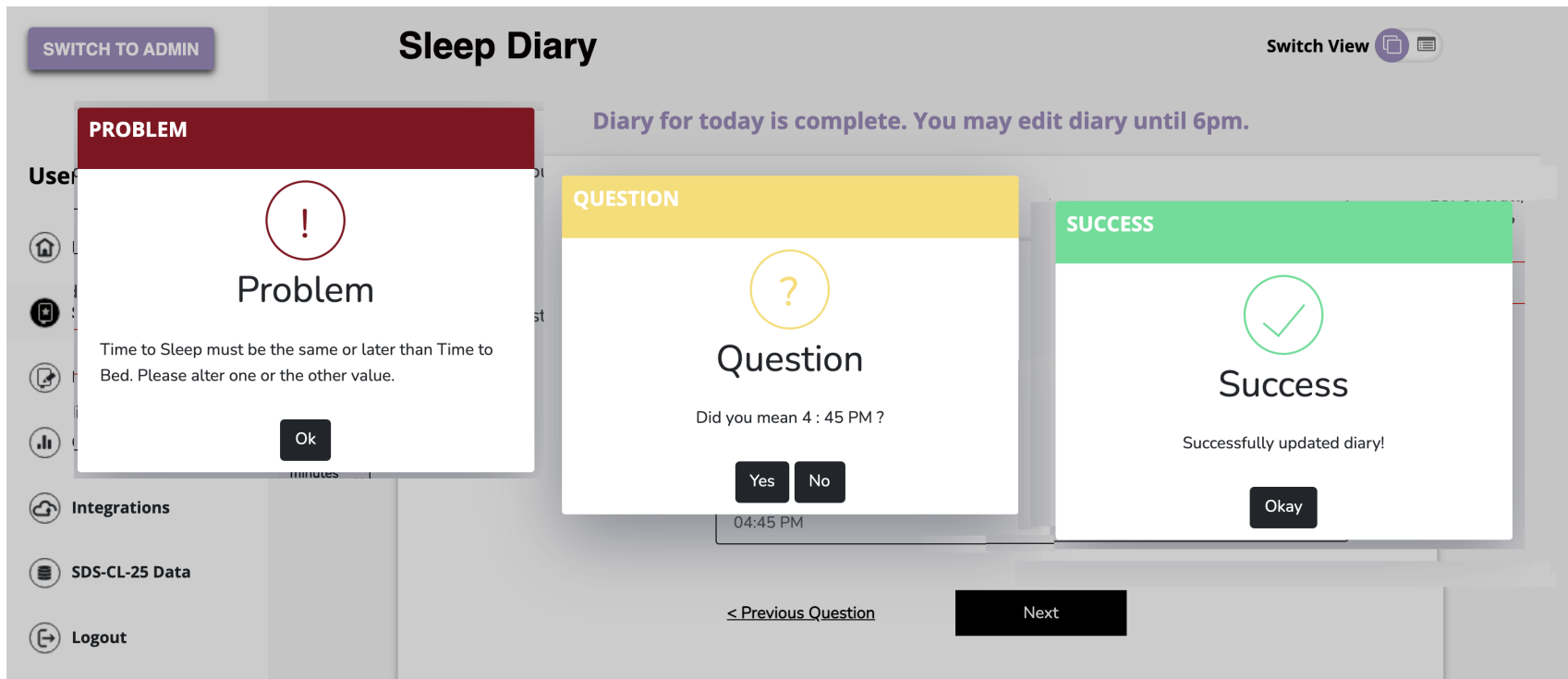
Presently Developed
Diary Data Database

Presently Developed
Sleep Data Graphics
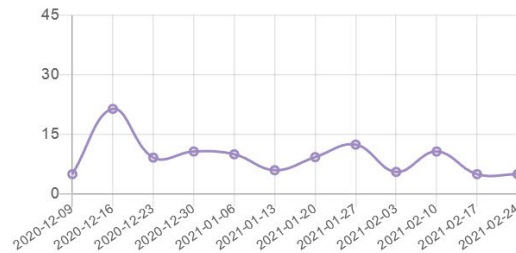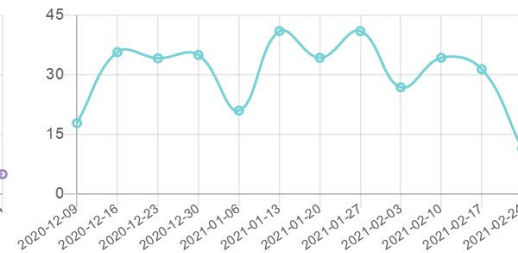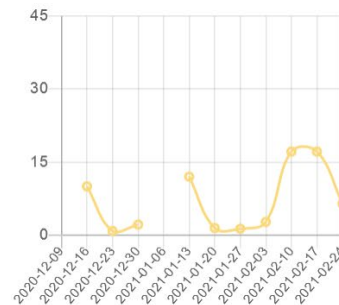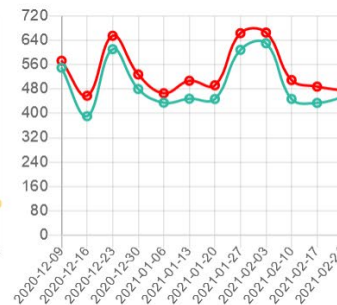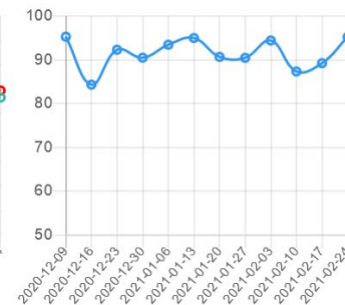
Presently Developed

Fitbit API interface

for data acquisition

for the provision of recommendations

Presently Developed
Fitbit API interface

Presently Developed
Dashboard Recommendations
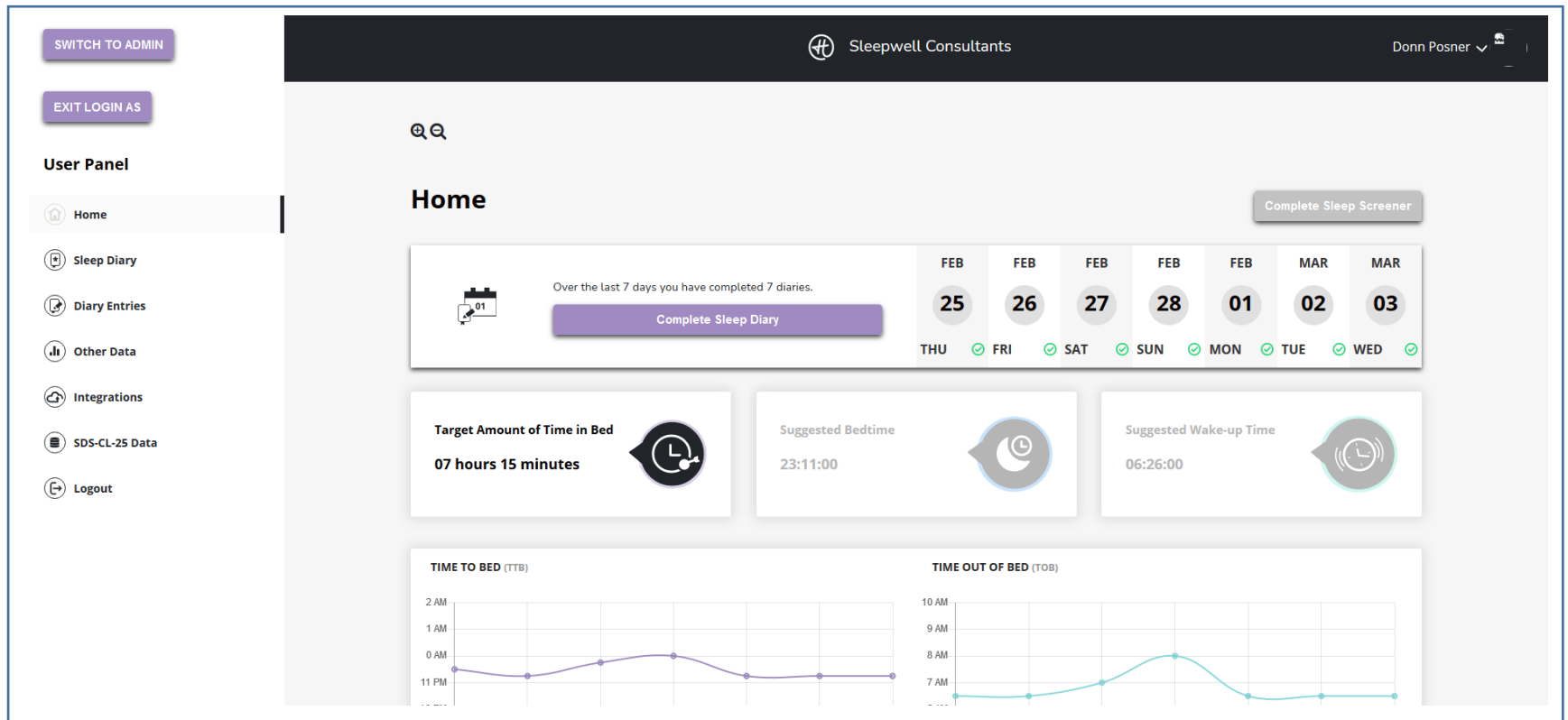
In Development / Planned Development

<u>Screener</u>
       Enhance aesthetics
       Allow email to have a report attachment

<u>Tracker and Reporter</u>
       Free standing tracker (for use by clinicians, researchers, & industry)
       Expand data capture from multiple passive trackers

<u>Process data (Optimizer)</u>
       via Hypknowledge sleep extension algorithm (<u>Beta version running</u>)
       via Hypknowledge sleep optimization algorithm

<u>Provide recommendations re: sleep scheduling (Optimizer)</u>
       via email and texts (<u>Beta version running</u>)
       via on-line dashboard (<u>Beta version running</u>)
       via voice interface / smart speakers (in development)

Hypknowledge

Michael A. Grandner PhD MTR

Director, Sleep and Health Research Program
Director Behavioral Sleep Medicine Clinic
Assistant Professor of Psychiatry
University of Arizona College of Medicine

Michael L. Perlis PhD

Director, Behavioral Sleep Medicine Program
Associate Professor of Psychiatry & Nursing
Perelman School of Medicine
University of Pennsylvania

Donn Posner PhD

Adjunct Clinical Associate Professor,
Psychiatry and Behavioral Sciences
Stanford University School of Medicine
Clinical/Research Psychologist, Palo Alto
Institute for Research

Dr. Michael Perlis

- Director of the Behavioral Sleep Medicine Program and Tenured Associate Professor of Psychiatry at the University of Pennsylvania

- Internationally recognized expert in sleep medicine with over 30 years of experience, especially in the domain of Behavioral Sleep Medicine

- Leading authority on treatments for insomnia

- Lead author/editor of the two primary textbooks in the field of Behavioral Sleep Medicine. Note: These texts have been translated into multiple languages.

- Lead lecturer and course developer for two CE three day workshops on CBT-I. These courses have provided training to more than 2000 individuals worldwide.

- > 165 publications on sleep

- An established track record of funding from the NIH

- Editorial Boards of SLEEP, Journal of Sleep Research, Behavioral Sleep Medicine, Sleep Medicine Reviews, Sleep Medicine Research, Health Psychology, and Behavioral Research and Therapy.

- Many national committee memberships and chairships, including being the founding President of the Society of Behavioral Sleep Medicine

Dr. Michael Grandner

- Director of the Sleep and Health Research Program at the University of Arizona

- Licensed clinical psychologist and Director of the Behavioral Sleep Medicine Clinic at the Banner-University Medical Center in Tucson

- Internationally recognized expert in sleep health with over 15 years of experience in the field

- Research focuses on real-world implications of sleep and health

- Published >100 scientific articles on sleep

- Editor of "Sleep and Health" – the first textbook in this field of research

- Editorial Board of SLEEP, Sleep Medicine, Journal of Clinical Sleep Medicine, Behavioral Sleep Medicine, Journal of Sleep Research, and Frontiers in Neurology; and Associate Editor of Sleep Health

- Many awards for his work from scientific and professional organizations

- Several national committee memberships and chairships

- Some work with FitBit, including presence on Scientific Advisory Panel

- Work with other organizations, including technology, athletics, and health companies

Dr. Donn Posner

- Nationally recognized master CBT-I therapist with over 30 years of experience

- Leading authority on treatments for insomnia

- Author/editor of the two CBT-I treatment manuals

- Lecturer and course developer for two CE three day workshops on CBT-I. These courses have provided training to more than 2000 individuals worldwide.

- One of the first certified behavioral sleep medicine specialists

- Founding member of the Society of Behavioral Sleep Medicine

- Recipient of the SBSM society's Peter Hauri Career Distinguished Achievement Award.

Where we stand

- First patent pending, second in preparation

- Expert-led scientific team

- Extensive sleep tech industry connections

- University backing

- Preliminary data showing proof-of-concept (Sleep Extension)

- 2nd generation platform (up and running)