

Assessing Circadian Rhythm Wellness with Wearable Monitoring Technology

ID: 4354

Featured Innovator: Stephen F. Smagula, PhD, Assistant Professor

Circadian rhythm abnormalities play a major role in the 21st century burden of disease such as in dementia, diabetes, depression, and sleep-wake disorders. There are currently only two products monitoring circadian rhythms that have reached market, both of which are dependent on mobile phone interaction. Circadian Activity Profiling System (CAPS) 1.0 is the first and only available wearable technology for passively measuring and analyzing circadian rhythms within the commercial space. By characterizing the user's circadian rhythms, CAPS can inform users if they are at a heightened risk for related health problems and provide a guide to intervention.

Technology Description

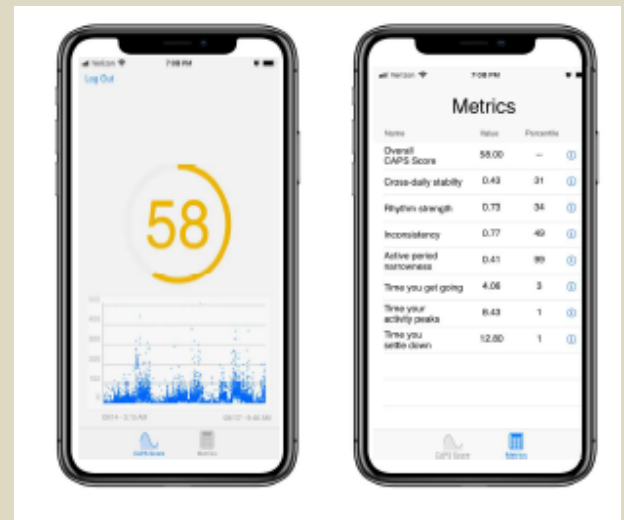
CAPS 1.0 provides information on circadian rhythm wellness and timing norms using raw sensor data via an Apple Watch. Users are given a CAPS Wellness Score which indicates their overall circadian rhythm health. These CAPS Wellness scores range from 1-100. For every 20 points higher an individual's Wellness score, the odds of several health problems are lower. Users are also provided with normative data and percentile ranks. CAPS 1.0 is the only wearable technology of its kind and sets the stage for future versions of the product that will not only monitor and characterize circadian rhythmic data, but will also provide automatically deliver personalized circadian interventions.

Advantages

- Monitors and characterizes circadian rhythm wellness and timing norms
- Real-time CAPS Wellness score to guide the application of interventions
- Compare circadian wellness metrics to medically validated normative data
- Only wearable technology of its kind
- Wide range of healthcare applications

Applications

- Risk assessment and interventions for health problems related to psychiatric and sleep-wake disorders
- Dementia prevention
- Pre/post pregnancy health evaluation
- Performance optimization for shift workers
- Jet-lag mitigation
- Quality of life improvements



Example displaying an individual's CAPS Wellness score (left image) and advanced circadian rhythm data (right image) as well as how that compares to normative data.

Stage of Development

- Completed: algorithm development and testing
- In progress: software implementation and informal testing
- Prepared for: formal testing then targeted release

IP Status

Invention Disclosure Submitted, University of Pittsburgh

Notable Mentions

- Grant of \$60,000 from Phillips Advanced Innovation
- Grant of \$20,000 from Chancellor's Innovation and Commercialization Award