Insights from a User Meeting on NightWare for PTSD-Related Nightmares: NightWare Product Development and Recommendations for Improved Sleep

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Abstract:
This white paper elucidates the clinical application of NightWare, a non-invasive, smartwatch-based digital therapeutic, in the management of Nightmare Disorder. Nightmare Disorder, characterized by recurrent, distressing nightmares, adversely affects daily functionality and many aspects of one's life. Despite the existence of numerous treatments, a substantial proportion of patients continue to remain unresponsive. A user meeting attended by sleep medicine doctors, psychiatrists, and other healthcare professionals was held to gather feedback from their experiences in treating Nightmare Disorder and PTSD-associated nightmares with NightWare. Insights such as patient data interpretation, sleep hygiene education, optimization of NightWare efficacy through combination with a sleep diary, periodic assessments, and potential future developments were gathered and summarized to serve as a resource to other clinicians who prescribe NightWare. NightWare's potential to detect and disrupt nightmares during sleep, in conjunction with traditional therapeutic measures, may lead to a more personalized, comprehensive, and effective approach, thereby significantly enhancing patient outcomes.

Introduction:
Nightmares, disturbing dreams that disrupt sleep, can lead to substantial emotional distress and hinder daily operations. Nightmare disorder is characterized by recurring, distressful nightmares that bring about significant distress or impairment in social, occupational, or other areas of functioning. Despite the availability of several treatments for this disorder, numerous patients remain unresponsive, leading to considerable morbidity and a diminished quality of life. NightWare presents a non-invasive and non-pharmacological wearable device that leverages smartwatch technology to identify and interrupt nightmares during sleep. This paper aims to synthesize the knowledge derived from a NightWare user meeting and discuss its relevance for clinicians treating patients with nightmare disorder.

Participants:
The meeting was moderated by COL (Ret.) Brian Robertson, MD, Chief Medical Officer of NightWare and attended by four clinicians supporting active duty military personnel representing psychiatry, psychology, occupational therapy, and sleep medicine. Clinicians preferred to not disclose their names.

Methods:
The user meeting was attended by sleep medicine doctors, psychiatrists, and other healthcare providers who treat patients with nightmare disorder. The meeting was designed to gather feedback from prescribers about the use of NightWare in clinical practice, including advice for improved sleep for patients and future developments. The meeting was structured as a moderated discussion, and the insights gained were recorded and summarized.

Results:
The user meeting generated several insights that have important implications for clinicians who treat patients with Nightmare Disorder. These insights are organized into the following categories: patient data interpretation, optimizing NightWare efficacy, sleep hygiene education, periodic assessment, and future developments.

Patient Data Interpretation:

- **Understanding sleep metrics on patient portal assist in optimizing comprehensive treatment plan for patients**

Bedtime, wake-up time, interventions, calculated stress, and adherence are all metrics that can be seen by the clinician on the patient portal. Inconsistent sleep times, prolonged sleep latency, and frequent night awakenings are indicators of potential sleep hygiene issues or insomnia. Understanding these patterns provides actionable insights for the clinicians and can help tailor a personalized sleep plan.

Optimizing NightWare Efficacy:

- **Recording nights in a sleep diary in conjunction with NightWare can improve understanding as it provides subjective experiences not captured elsewhere**

There was a consensus that combining NightWare with a sleep diary could provide a powerful tool for patient management. The sleep diary, filled out by patients, provides subjective experiences that could be cross-referenced with NightWare's objective data, offering a holistic

understanding of the patient's sleep pattern and sleep quality..

Sleep Hygiene Education:

- **Educate patients on sleep hygiene, device use, and what their NightWare data means**
- **Relaxation techniques before bed could be part of this education**

Sleep hygiene education forms an integral part of optimizing sleep for patients. Clinicians discussed the need for comprehensive patient education material, focusing on sleep hygiene, device use, and instructions to interpret data. Techniques to promote sleep, such as relaxation exercises, reading calming material, or listening to soothing audio content before sleep, could be part of these educational resources.

Periodic Assessment:

- **ISI and Nightmare Distress Questionnaire are good tools for periodic assessment along with personalized questions for their feedback**

Periodic assessments were discussed to evaluate patients' progress and adjust interventions accordingly. Tools like the Insomnia Severity Index (ISI) and Nightmare Distress Questionnaire were suggested for regular use, besides more personalized questions relating to frequency of nightmares and feelings of rest after sleep.

Future Developments:

- **Patient surveys to be gathered on patient device and answers to be visible in portal**
- **Adjustable no-intervention period (currently locked at 30 minutes)**

It was emphasized that a more comprehensive summary of patient outcomes was needed on the patient portal. Right now, objective metrics can be seen on the portal; however, there are no subjective measures taking into account patient feedback. One idea was to incorporate direct patient feedback from the patient NightWare phone to the patient portal for prescribers to view. This would allow for a more communicative patient experience and effective clinical management. Another idea for future development was to allow multiple or adjustable no-vibration grace periods at the start of a sleep session, catering to patients with different sleep latency periods.

Conclusion:

Throughout this white paper, we have delved into the unique challenges presented by Nightmare Disorder and the novel benefits that NightWare brings to the clinical landscape. Key insights from a user meeting highlighted the critical importance of patient data interpretation, optimizing NightWare efficacy with the adjunctive use of a sleep diary, the central role of sleep hygiene education, the necessity of periodic assessments, and potential future developments. This discussion highlights how the integration of technology like NightWare, coupled with traditional therapeutic measures, can facilitate a more personalized, comprehensive, and effective approach to treating Nightmare Disorder, ultimately enhancing patient outcomes.

Meeting insights will be incorporated into the NightWare Clinical Treatment Guidelines which provides prescribing clinicians the best practices for maximizing outcomes through utilizing NightWare. If you would like to request access to this document you may email nightwareprofessionaleducation@nightware.com or visit the Prescriber Resources section at www.nightware.com.