Case study

Validating nocturnal respiratory signs as biomarkers in pediatric populations

About Albus Health

ALBUS HEALTH

Albus Health is a respiratory health technology company dedicated to improving outcomes for chronic conditions like asthma through contactless, passive monitoring. Their flagship solution, the Albus Home device, is a bedside monitor designed to capture continuous nocturnal health metrics without requiring any physical contact with the patient. By automating the collection of symptom data during sleep, Albus Health aims to bridge the gap between home life and clinical care, providing early warning signals for exacerbations and objective measures of recovery.

The opportunity

Capturing the "unseen" nocturnal symptoms of pediatric populations.

- The opportunity lies in broadening the definition of **sleep measurement** to include not just sleep stages, but the specific **respiratory symptoms** that occur during sleep.
- For example, nocturnal symptoms, such as coughing and changes in respiratory rates for children with asthma, are key indicators of deteriorating control but are frequently missed or under-reported by sleeping children and tired parents.
- Respiratory failure is a leading cause of morbidity in rare neuromuscular disorders. The ability to continuously track nocturnal respiratory patterns provides a critical safety net and a potential clinical endpoint for diseases where respiratory muscle weakness is a primary concern.

The challenge

- Managing **pediatric conditions** relies heavily on caregivers recognizing symptoms, which requires active effort, and is inherently subjective and prone to error. A truly effective solution must be passive and contactless.
- Many children with rare neurodevelopmental conditions suffer from heightened sensory responses that make wearable sensors intolerable. A **contactless form factor** offers a unique opportunity to monitor these "hard-to-measure" populations without causing distress or behavioral disruption.

The approach

- **Contactless nocturnal monitoring of breathing patterns.** The Albus Home device sits at the bedside and continuously monitors nocturnal metrics such as vital signs, sleep, cough and respiratory rate (RR) without touching the child.
- Piloted in pediatric asthma, Albus Health deployed their contactless device in the Childhood Home Asthma Monitoring Study (CHAMP). The study analyzed data from children aged 6-16 with asthma, specifically looking at the 15-day window before and after a confirmed asthma attack. Instead of relying on diaries, the system automatically calculated daily aggregates of cough frequency and respiratory rate, creating a high-resolution timeline of the exacerbation.

The impact

- ✔ **The CHAMP study results demonstrated the power of nocturnal symptom tracking as a predictive biomarker.**
- ✔ The device successfully detected a significant increase in nocturnal cough frequency and respiratory rate 5 days prior to the clinical diagnosis of the attack. This creates a vital 5-day "therapeutic window" where clinicians and caregivers could potentially intervene to prevent the attack entirely.
- ✔ This study serves as a proof-of-concept for objective, contactless monitoring in **pediatric trials**, validating that nocturnal signals can reliably track both the onset and resolution of asthma exacerbations.
- ✔ By continuously capturing nocturnal symptoms, this technology creates dense, longitudinal datasets. In **rare disease trials**, this depth can allow researchers to use each patient as their own control (intra-patient analysis), compensating for small sample sizes and enabling the detection of subtle disease trajectories that sporadic clinic visits would miss.

> “Nocturnal symptoms are among the clearest signals of worsening disease, yet they’re rarely captured, especially in children who won’t tolerate sensors during sleep. This 12 month study demonstrates that passive monitoring during sleep is the ideal solution to track clinically meaningful signals with high sustained acceptance from children and families. We’re very excited to take this forward with our partners to transform how disease worsening, symptom burden and response to treatment is measured in clinical trials and healthcare.”
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> **— Mikesh Udani**
> *Co-founder and CEO*