DROWZLE® PRO is a digital platform that uses a smartphone for in-home detection of obstructive sleep apnea (OSA) in adults. Since it is deployed by the patient's own phone, DROWZLE PRO provides testing to many patients for whom in-lab PSG or conventional home sleep testing may not be an acceptable option.

Unlike traditional HSTs, there are no sensors to attach to the body, making testing extremely easy. As an added benefit, there is no equipment to track down, retrieve, and disinfect prior to distributing to another patient.


## *HOW DROWZLE PRO WORKS*

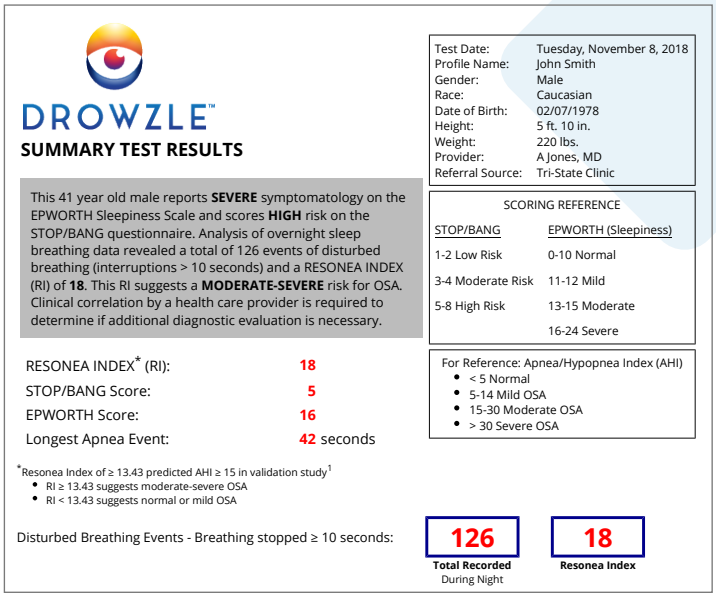
DROWZLE PRO collects relevant symptom, co-morbidity and functional quality-of-life data from the patient and combines this information with an overnight breathing analysis to give both the patient and the provider an easy to read report with actionable results.

The patient records their breathing by placing the phone near their pillow and activating the program to record and analyze their sleep breathing disturbances overnight. In the morning, both the patient and provider receive their respective reports.

DROWZLE PRO shortens the evaluation time for OSA and motivates patients to take action.

## *THE RESONEA INDEX (RI)*

Unlike conventional HSTs, DROWZLE PRO does not report an Apnea Hypopnea Index (AHI). Instead, DROWZLE PRO produces the Resonea Index (RI), a clinically validated, proprietary algorithmic calculation based on an analysis of sleep breathing patterns and clinical measures (e.g. signs and symptoms) that are closely related to the presence of OSA. By combining diverse clinical elements with a physiologic measure, the RI is a simple composite score that provides a broader clinical representation of a patient's OSA status.



DROWZLE™

**SUMMARY TEST RESULTS**

This 41 year old male reports **SEVERE** symptomatology on the EPWORTH Sleepiness Scale and scores **HIGH** risk on the STOP/BANG questionnaire. Analysis of overnight sleep breathing data revealed a total of 126 events of disturbed breathing (interruptions > 10 seconds) and a RESONEA INDEX (RI) of **18**. This RI suggests a **MODERATE-SEVERE** risk for OSA. Clinical correlation by a health care provider is required to determine if additional diagnostic evaluation is necessary.

| | |
|---|---|
| RESONEA INDEX* (RI): | 18 |
| STOP/BANG Score: | 5 |
| EPWORTH Score: | 16 |
| Longest Apnea Event: | 42 seconds |

*Resonea Index of ≥ 13.43 predicted AHI ≥ 15 in validation study[1]
- RI ≥ 13.43 suggests moderate-severe OSA
- RI < 13.43 suggests normal or mild OSA

| | |
|---|---|
| Test Date: | Tuesday, November 8, 2018 |
| Profile Name: | John Smith |
| Gender: | Male |
| Race: | Caucasian |
| Date of Birth: | 02/07/1978 |
| Height: | 5 ft. 10 in. |
| Weight: | 220 lbs. |
| Provider: | A Jones, MD |
| Referral Source: | Tri-State Clinic |

SCORING REFERENCE

| STOP/BANG | EPWORTH (Sleepiness) |
|---|---|
| 1-2 Low Risk | 0-10 Normal |
| 3-4 Moderate Risk | 11-12 Mild |
| 5-8 High Risk | 13-15 Moderate |
| | 16-24 Severe |

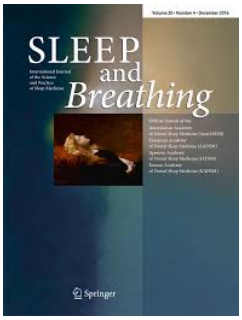
For Reference: Apnea/Hypopnea Index (AHI)
- < 5 Normal
- 5-14 Mild OSA
- 15-30 Moderate OSA
- > 30 Severe OSA

Disturbed Breathing Events - Breathing stopped ≥ 10 seconds:

126 **Total Recorded** During Night

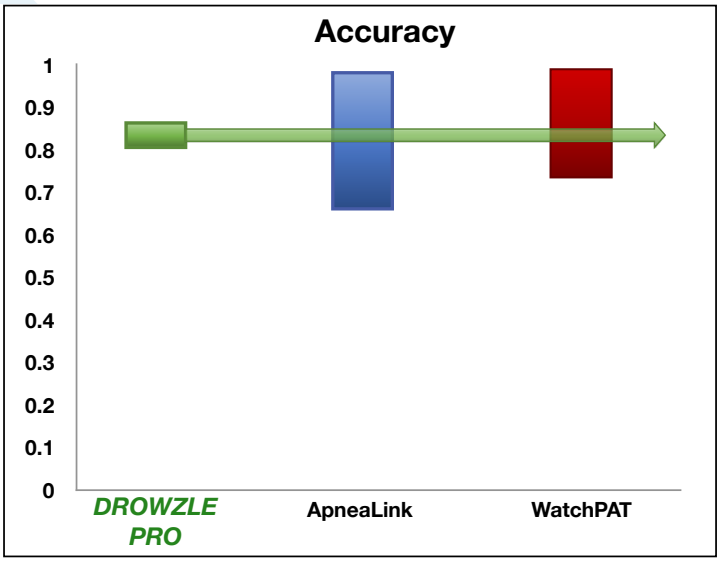
18 **Resonea Index**

## *CLINICALLY VALIDATED ACCURACY AGAINST PSG*

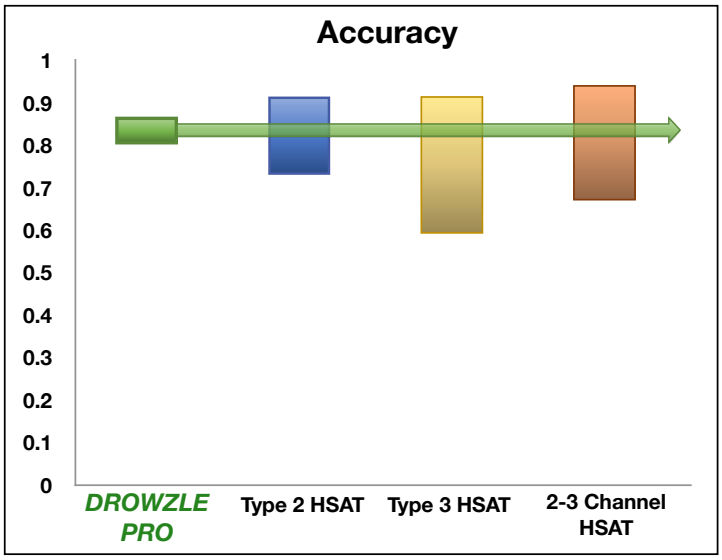



Data from a clinical trial with simultaneous smartphone recordings and in-lab polysomnograms:[1]

- The Resonea Index (RI) was compared to PSG for detection of normal/mild vs. moderate/severe OSA.
- It was demonstrated that the RI can accurately predict OSA with a sensitivity of 93.6% for normal/mild and 93.7% for moderate/severe OSA.
- The RI accuracy is within the range of what has been reported for popular HSTs as well the range reported in the AASM guidelines for each type of HST.[2]




Accuracy ranges for popular HSTs compared to DROWZLE PRO[1]




Accuracy ranges *as reported in the AASM guidelines* for each type of HST[2] compared to DROWZLE PRO[1]

| | DROWZLE PRO | Type 2 HSAT | Type 3 HSAT | 2-3 Channel HSAT |
|---|---|---|---|---|
| **Sensitivity (Range)** | 0.94 | 0.88 - 0.97 | 0.62 - 1.0 | 0.66 - 0.96 |
| **Specificity (Range)** | 0.63 - 0.67 | 0.50 - 0.77 | 0.25 - 0.97 | 0.62 - 1.0 |

Sensitivity and specificity ranges *as reported in the AASM guidelines* for each type of HST[2] compared to DRWZLE PRO[1]

## *DROWZLE PRO - FDA CLEARED*

In 2019, the US Food and Drug Administration cleared DROWZLE PRO as the first mobile home sleep test for in-home screening of adults with suspected sleep breathing disorders, such as obstructive sleep apnea (OSA). The full Indication for Use statement is located on the company's web site at https://www.resonea.com/drowzle-pro

1. Narayan S et al; Noncontact identification of sleep-disturbed breathing from smartphone-recorded sounds validated by polysomnography; Sleep and Breathing 2018; doi.org/1007/s11325-1695-6
2. Published reference sources for product comparisons available upon request

DROWZLE® PRO