



ValidationInstitute

2024 Validation Report

Review for: Xandar Kardian
Validation Achieved: Outcomes
Valid through: June 2025



Company Profile



X A N D A R K A R D I A N

| | |
|---------------------------|---|
| Category: | Predictive and Preventive Health |
| Website: | https://xkcorp.com/ |
| Public or Private: | Private |
| Year Established: | 2017 |
| CEO: | Sam Yang |
| Company contact: | (312) 749-8649 |

Description provided by the company:

Founded in 2017 with a vision to leverage advanced radar technology for practical applications, **Xandar Kardian** developed a revolutionary approach to monitoring vital signs, such as heart rate and respiratory rate, using ultra-wide band radar. Initially focused on security and property technology (PropTech) applications, the company has since expanded to offer innovative healthcare solutions including sensors used for remote patient monitoring.

This transition underscores the company's commitment to enhancing patient care and improving clinical outcomes, particularly for frail or vulnerable individuals. The scope of contactless monitoring extends beyond traditional healthcare settings to include applications in senior living, home care and even correctional facilities, highlighting the broad potential of **Xandar Kardian's** innovations to improve quality of care across the continuum.





Company Profile

The XK300 Sensor Overview

The XK300 sensor was the first commercially available, US FDA 510(K) cleared, Class II medical device to use radar to monitor vital signs. By combining sophisticated radar technology capable of detecting micro and nano-vibrations emitted from the human body, with proprietary digital signal processing algorithms, the XK300 enables continuous, autonomous and contact-free monitoring of vital signs under various conditions and through obstructions like blankets and clothing.

The sensor is designed to be mounted on the wall or ceiling which eliminates the need for patient compliance and direct physical contact, ensuring non-intrusive monitoring for the patient. This setup not only maintains high standards of patient privacy (free from cameras and microphones), but optimizes patient compliance for longer-term monitoring.

Continuous monitoring allows healthcare teams to efficiently identify and respond to early signs of health deterioration among patients. Proprietary algorithms driven by the XK300 are designed to provide timely and actionable patient interventions, reducing the necessity for emergency interventions and potential hospital transfers.





Claim Assertion for Validation

Xandar Kardian's XK300 sensor and the POBC score are effective for the early detection of clinical changes to enable early intervention. Hospital transfers were used as a metric to reflect clinical changes. Validation confirmed that the POBC score predicted 75.6% of hospital transfers in a group of 201 patients.





Method / Calculation / Examples

Continuous heart and respiratory data collected from the XK300 sensor can be analyzed using Xandar Kardian's Probability Baseline Change Score (POBC) which is designed to quantify how unusual a patient's most recent readings are compared to their own baseline.

The POBC score ranges from -100% to +100%; POBCs less than zero indicate the patient's rates are falling, and greater than zero indicates rates rising. The POBC score is reported daily and is calculated from the very large volume of heart and respiratory rates collected each day from the sensors (typically between 4,000 and 7,000 measurements each, each day). The intention of the POBC score is to notify care providers (such as a nursing facility) to patients who may need additional assessment or care, or at greater risk of a hospital transfer.

Heart and respiratory rate POBC scores were analyzed for 7 days preceding a hospital transfer; 201 patients who were monitored by the XK300 sensor and who had a hospital transfer were included in the data set. These were compared to POBC scores for 2,525 people who were also monitored by the XK300 sensor but who did not have a hospital transfer.

The analysis found that the POBC score predicted 75.6% of hospital transfers. Those who had a hospital transfer were more likely to have a heart rate POBC score less than -80% or more than +90% or a respiratory rate POBC of less than or equal to -80% or greater than or equal to +65%.





Method / Calculation / Examples

By notifying the care provider when vital signs change in a meaningful way, providers can intervene sooner than they might otherwise have, prioritize care, and triage patients who need closer assessment.





Findings & Validation

Xandar Kardian's XK300 sensor's score, the Probability Of Baseline Change (POBC), effectively detects early clinical changes, predicting 75.6% of hospital transfers up to 7 days before, in a validation study with 201 patients.





Limitations

The system generated notifications for patients who were not transferred to hospital approximately 47.6% of the time. While these are considered false positives for the purpose of this analysis, it cannot be concluded that these notifications were not clinically relevant, as not all changes in clinical condition result in a hospital transfer. As the POBC is designed to notify caregivers of significant changes to a patient's baseline vital signs, it is expected that some clinically relevant changes to patient condition were managed in place or not severe enough to warrant a hospital transfer.

The thresholds for generating notifications can be adjusted to balance the prevention of hospital transfers against false positives. Although those notifications only rely on the POBC score, integrating additional metrics such as sleep quality or bed occupancy should improve the system's ability to identify abnormalities, leading to more tailored and effective interventions.





Validation and Credibility Guarantee

Xandar Kardian's XK300 sensor achieved validation for **Outcomes**.

Validation Institute is willing to provide up to a \$100,000 guarantee as part of their Credibility Guarantee Program. To learn more, visit

<https://validationinstitute.com/credibility-guarantee/>.

Savings

Can reduce health care spending per case/participant or for the plan/purchaser overall.

Outcomes

Product/solution has measurably improved an outcome (risk, hba1c, events, employee retention, etc.) of importance.

Metrics

Credible sources and valid assumptions create a reasonable estimate of a program's impact.

Contractual Integrity

Vendor is willing to put a part of their fees "at risk" as a guarantee.





CERTIFICATE OF VALIDATION

Applicant: **Xandar Kardian**
5000 Yonge St. Suite 1001,
Toronto, Ontario, M2N 7E9, Canada

Product: XK300 sensor

Claim: Xandar Kardian's contactless health monitoring system XK300 uses continuous heart and respiratory data together to predict that a person is likely to have a hospital transfer. The system, combined with POBC score predicted 75.6% of hospital transfers in a group of 201 patients.

Validation Achieved: **Validated for Outcomes**

Award Date: June 2024

Linda K. Riddell, MS
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Validation Institute

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Validation Institute





About Validation Institute

Validation Institute is a professional community that advocates for organizations and approaches that deliver better health value - stronger health outcomes at lower cost. We connect, train, and certify health care purchasers, and we validate and connect providers delivering superior results. Founded in 2014, the mission of the organization has consistently been to help provide transparency to buyers of health care.

Validation Review Process

Validation Institute has a team of epidemiologists and statisticians who review each program. The team focuses on three components:

- Evidence from published literature that a similar intervention had similar results.
- The reliability and credibility of the data sources.
- The rigor of the approach to calculating results.

To achieve validation, the program has to satisfy each of these components. VI's team then summarizes the review into a report which is publicly available. Details of VI's review are available with the program's permission.

