THE EFFICACY OF EXERGEN TEMPORAL ARTERY THERMOMETERS IN IMMUNOCOMPROMISED PATIENTS

Prepared by Exergen Corporation

Executive Summary

This white paper presents a comprehensive analysis of the efficacy of Exergen's Temporal Artery Thermometers (TAT-5000 Series) as a non-invasive alternative for temperature assessment in immunocompromised patients.

Drawing from multiple peer-reviewed clinical studies and expert interpretation from Dr. Francesco Pompei, inventor of the Temporal Artery Thermometer, this document examines the clinical accuracy, fever sensitivity, patient comfort, infection-prevention alignment, and operational benefits of using temporal artery thermometry in oncology, transplant, and other immunocompromised care settings.

Introduction

Early fever detection is critical in immunocompromised patients to enable timely sepsis workup and antimicrobial therapy. Traditional methods—rectal, oral, axillary, tympanic—can be invasive, contraindicated, or inconsistent. The Exergen TAT-5000 Series provides a validated, non-invasive alternative that delivers core-correlated accuracy with advantages in speed, comfort, and workflow efficiency.

Problem Statement

Rectal thermometry, the traditional gold standard for core temperature, presents significant limitations for this population:

- Risk of mucosal trauma and bacteremia in neutropenic or thrombocytopenic patients
- Contraindications in patients with mucositis, diarrhea, or perianal disease
- Increased discomfort, infection risk, and workflow burden

A clinically validated, non-invasive solution is needed that supports frequent monitoring while minimizing patient risk and staff burden.

Methodology

This white paper draws upon peer-reviewed studies evaluating the Exergen TAT-5000 Series in oncology, transplant, PICU, and ICU settings, including:

- Prospective comparisons with rectal, oral, axillary, and bladder measurements
- Analysis of bias, precision, and fever alert sensitivity at neutropenic thresholds
- Evaluation of patient preference and nursing workflow impact
- ICU-wide outcomes after conversion to TAT thermometry

Interpretation is supported by expert commentary from Dr. Francesco Pompei.

Key findings – Accuracy and Fever Sensitivity

- **Opersteny et al. (2017):** In 298 pediatric surgical patients, TAT readings were on average 0.7°C higher than axillary and 0.6°C higher than oral, resulting in more actionable fever alerts at ≥38.3°C. TAT showed better precision and was overwhelmingly preferred by patients and caregivers.
- **Hebbar et al. (2005):** In PICU patients, TAT bias compared to rectal was only 0.035°C. No significant effect of shock or vasopressor use. Concluded TAT is a suitable alternative when invasive thermometry is contraindicated.
- **Niven et al. (2013):** Among 18,989 ICU admissions (2,104 immunocompromised), adoption of TAT was associated with a 5.1% decrease in recorded fever incidence without an increase in bloodstream infections or adverse outcomes.

Key Findings – Patient Comfort and Safety

- TAT was preferred by a majority of patients/caregivers and caused less disruption, even in sleeping children.
- Non-mucosal site avoids trauma risk in neutropenic/thrombocytopenic patients.
- When used with disposable caps and IFU-directed cleaning, surface contamination risk remained below threshold.

Key Findings – Workflow and Clinical Preference

- Rapid 2–5 second measurement supports frequent monitoring and isolation protocols.
- Facilitates trending across care settings (ED → Oncology → ICU → Step-down).
- Staff cite ease of use, reduced PPE burden, and confidence in fever detection.

Discussion

The evidence demonstrates that Exergen TAT-5000 Series thermometers provide clinically acceptable accuracy, strong fever sensitivity, and superior patient tolerance in immunocompromised care. Their non-invasive design supports infection-prevention protocols and operational efficiency.

Conclusion

Exergen's TAT-5000 Series offers:

- Accuracy comparable to core measurements
- Early, sensitive detection of fever
- Non-invasive, patient-preferred design
- Infection-control and workflow advantages

These benefits make TAT the preferred method for routine temperature assessment in immunocompromised units.

References

- Opersteny E, et al. *J Pediatr Nurs.* 2017;35:36–41.
- Niven DJ, et al. *Crit Care Med.* 2013;41:1863–69.
- Hebbar K, et al. *Pediatr Crit Care Med.* 2005;6:557–561.

About Exergen

Exergen Corporation is a global leader in infrared temperature measurement technologies. With over 100 published studies validating the TAT-5000 series, it is widely used across critical care environments. All Exergen medical thermometers are proudly made in the USA and backed by a lifetime guarantee. The TAT-5000S is trusted by clinicians worldwide to deliver accurate, safe, and efficient temperature assessments—especially in the moments that matter most.

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