

# e-Health and Alternative Healthcare Innovations

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## **Making thyroid function testing accessible by using mobile app to estimate Achilles reflex time**

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Most current methods for determining patient thyroid function rely on T3, T4, and TSH hormone concentrations in blood serum. However, these methods are invasive, relatively expensive, time-consuming, and require specialized laboratory equipments to collect and analyze a blood sample. Development of reliable, inexpensive, and express methods of estimating thyroid function is an urgent need, especially in developing nations for screening large populations in these countries. Reflexometry is a rapid, reliable, and inexpensive diagnostic screen utilized for more than 50 years in clinical practice to evaluate thyroid status. Multiple studies have demonstrated a strong positive correlation between the thyroid gland state and Achilles reflex reaction time, specifically the half-time of relaxation. Available medical devices used to take such measurements are scarce and impractically expensive (e.g., EMG recorders, Thyroflex, etc.), requiring specific equipment/sensors and trained personnel. Utilizing a novel motion analysis algorithm, our preliminary data of an Android-based and iOS app installed on a mobile device with a high-resolution camera indicates the potential for a practical, inexpensive, and highly accessible approach to evaluating duration of Achilles reflex and thyroid status. Analysis of results from healthy volunteers showed precision comparable with other methods to estimate duration of the Achilles reflex. Our approach does not require any additional equipment except cell phone with installed application. Our goal is to continue refining the app and algorithm for optimal analysis and determine whether and how to best measure reflex data as a tool for point-of-care express evaluation of thyroid status.

### **Biography**

David Wright is a fourth-year medical student at the American University of Integrative Sciences, School of Medicine, Barbados, and passionate about integrative health and holistic approaches to patient care. He holds a Master of Science degree in Maharishi AyurVeda and Integrative Medicine from Maharishi International University, Fairfield, Iowa. He currently works as a Graduate Instructor and as a founding member of the Integrative Medicine Fellowship Committee at MIU.