

## **Developing Point-of-Care Technologies for Healthcare in Rural and Underserved Communities**

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To address the challenges posed by the shortage of healthcare professionals and resources and to improve health access, outcomes, and equity, there is a growing need for technologies that empower healthcare professionals to make faster, more precise diagnoses and treatment decisions. One type of technology that holds promise in this regard is point-of-care technology, encompassing information systems such as bedside terminals or devices for capturing and inputting data at the location where patients are being treated. These technologies not only have the potential to enhance efficiency, reduce turnaround time, decentralize diagnostics, and advance healthcare in remote and underserved communities but also to significantly reduce the unnecessary use of healthcare resources. Additionally, point-of-care technologies can guide clinical decision-making for acute and chronic conditions.

Our research, spanning nearly two decades, has been dedicated to developing unique point-of-care diagnostic devices. These include devices and systems for monitoring wound healing, rapid skin cancer diagnosis using photoacoustic technology, surface-acoustic wave systems for virus detection, and label-free biosensors for detecting influenza and Ebola viremia. These point-of-care devices could help to aid disease surveillance, prevent transmission events, and contribute to containing infectious disease outbreaks. In this paper/presentation, we will use the example of developing a wireless telemetric Wound Healing Monitoring system to underscore the potential and significance of point-of-care technologies, their associated benefits, challenges, concerns, and, most importantly, their trajectory in healthcare. The wireless telemetric Wound Healing Monitoring system, as a practical example, holds great promise for implementation, particularly in settings with limited or overstretched healthcare infrastructures. Specifically, the presentation will shed light on the challenges in transitioning from bench-scale prototypes to pre- and clinical trials and commercializing these technologies and how this transition impacts the advancement of deploying technologies developed at relatively modest academic institutions.