A Novel, Miniaturized, Non-Invasive Device for Pressure Injury Prevention

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Pressure injuries typically develop over bony prominences on the body such as the heels, sacrum, hips, and elbows, where blood flow to the skin is reduced due to sustained pressure. Their occurrence causes the mortality of more patients annually than any single cancer (except lung cancer) and results in increased hospitalizations and mortality. Pressure injuries remain a significant challenge for hospitals and other healthcare settings, and while other hospital-acquired conditions continue to fall, US national rates of pressure injuries continue to remain steady or even rise. The objective of this research is to first identify factors that can be used to predict PI occurrence for ICU patients. This will include a comparison of pressure injury positive and negative populations extracted from electronic health record database for the period of 2008-2022, and identification of factors associated with higher PI occurrence, and ICU and hospitalization recurrence, emphasizing actionable factors for PI prevention. Associations will be examined to identify differences among patient's first and repeat ICU stays across 94,458 ICU stays, supported by stay-level and patient-level distribution summaries, association tests, and logistic regressions. The second objective of this project is a novel and inexpensive device that is compact and can be implemented as reusable or disposable to provide real-time monitoring not only in hospital beds, but in home and long-term care settings. Prior evidence indicates that such technology can enhance patient mobility monitoring, facilitate for most effective and timely repositioning, and ultimately reduce incidence of pressure injuries among the most susceptible populations.

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