Insight commercial case studies

Sector: Smart Manufacturing

Insight
SFI RESEARCH CENTRE FOR DATA ANALYTICS

SWAB – Smart Wound Analysis of Bacterial Volatiles

A novel method for rapid non-invasive characterisation of bacterial infections in wounds

Executive Summary

Challenges

The challenge was to find a way of analysing open wounds in a clinical setting in both a non-invasive and time-sensitive fashion.

What Insight Delivered

Insight delivered a non-invasive wound monitoring approach with a rapid turnover of data that will ultimately accelerate clinical workflows.

Impact

Comprehensive volatile screening of wound swabs achieved using gas chromatography-mass spectrometry analysis.

Unsupervised learning techniques allow microbial volatile trends across non-infected and infected populations be identified.

Identification of such trends will allow infection-associated biomarkers to be subsequently identified.

In the future, infection-associated biomarkers can then be targeted in hospitals.

Close collaboration with clinical partners established for the project.

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Background

In a clinical setting, open wounds are a common source of infection. This project aims to explore and investigate novel and potentially non-invasive measures to detect and identify these infections. Any new technique or assessment must also be cognisant of the time sensitive nature of a hospital setting, and should seek to increase the speed at which infections are identified, in order to facilitate timely intervention.

Solution and Outcome

Using Insight's expertise in wearable technology, sensing and detection, and materials chemistry, the Smart Wound Analysis of Bacterial Volatiles (SWAB) was envisaged. SWAB is a novel method for rapid characterisation of bacterial infections in wounds that exploits the '*smell of infection*' to profile the microbial environment of the wound. The method provides a comprehensive volatile screening of wound swabs using solid-phase microextraction and gas chromatography-mass spectrometry. Unsupervised learning techniques allow microbial volatile trends across non-infected and infected populations be identified, which will allow infection-associated biomarkers be subsequently identified. Crucially, this method of wound monitoring is rapid and has a fast turnover of data that will ultimately accelerate clinical workflows.

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