



## Team 8

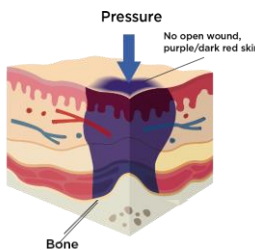
# SacraFlow Probe: Detecting Sacral Pressure Injuries in Admitted Patients via Diffuse Correlation Spectroscopy

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### Need

- Pressure injury:** tissue necrosis due to pressure on bony prominence
- Incidence rate: 38% in hospitals
- Current method of detection uses a qualitative visual scale



**No clinically accepted technology for detecting pressure injury quantitatively**

**Objective:** Design a diffuse correlation spectroscopy probe to measure change in microvascular blood flow indicative of ischemia in the sacral region during pressure injury

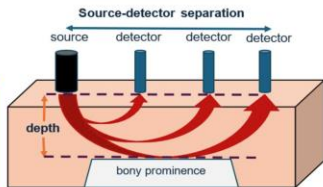
### Design Inputs

#### Requirements

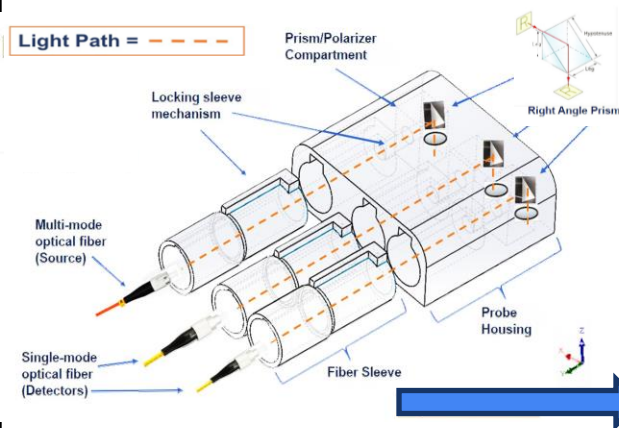
- R1. Assembly tolerance  $\pm 0.15\text{mm}$
- R2a. 8-20mm Source-Detector Separation
- R2b.  $\geq 60\%$  decrease in Blood Flow Index
- R3. Application at sacrum
- R4. Tensile strength  $\geq 13.3\text{N}$

#### Constraints

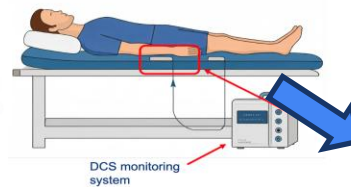
- C1. Biocompatible
- C2. Max laser power  $5\text{mW/mm}^2$



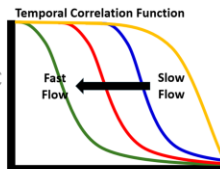
### Solution Design



### Intended Use

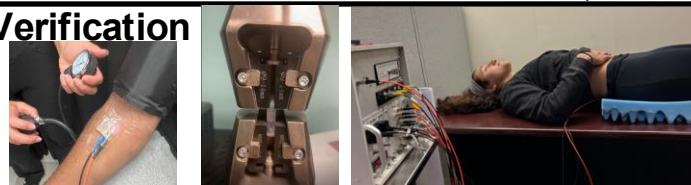


### Assembly Video



**Blood Flow Index: BFI ( $\text{cm}^2/\text{s}$ )**

### Verification



Test	Requirement	Results
Assembly Fit	R1	Pass
Legacy vs SacraFlow Function	R2a, R2b	Pass
Detection of Ischemia at Sacrum	R3	Pass
Locking Mechanism Strength	R4	Pass

### Impact

The **SacraFlow Probe** is a **non-invasive solution** capable of **quantifying blood flow** in the sacral region and **detecting ischemia**.

**Early detection** of pressure injury can **prevent painful, expensive treatment** and has potential to be seamlessly **integrated into the admission process**.