INFECTION MONITORING BANDAGE (IMB)
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MYANT

Problem Statment

• Post surgical infections affect 2-20% of surgery patients[1] and cost the healthcare industry $30 billion annually[2]

• Wound monitoring can identify infections earlier and improve patient outcomes

Background

• Wound healing biomarkers: pH, temperature, lactate and bacterial count[3]

• Increased skin temperature and wound pH above 8.0 are indicative of bacterial infection, these biomarkers will be used[3]
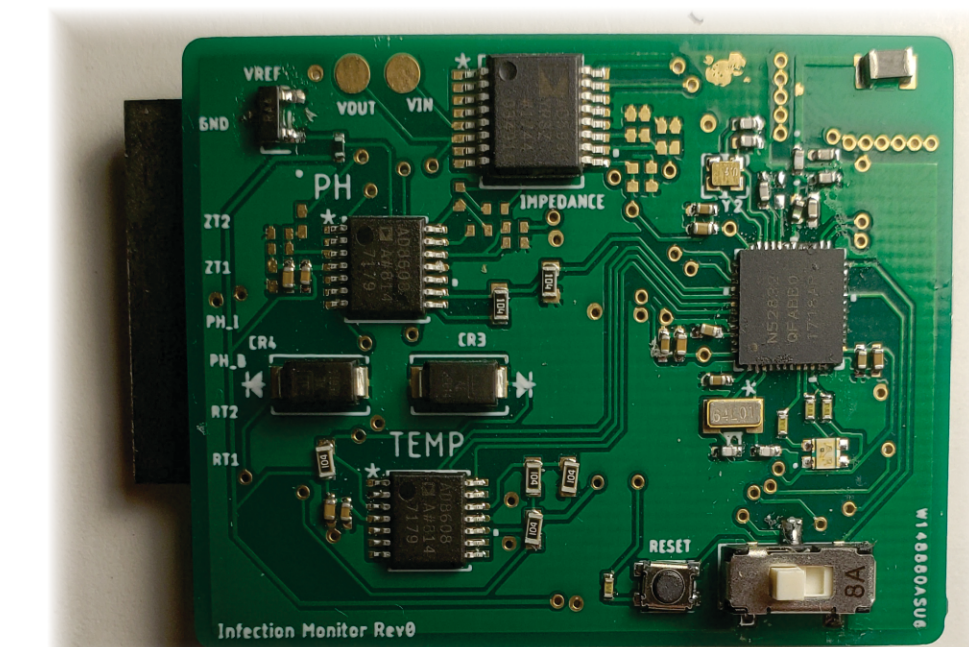
Design

Sense

• pH and temperature sensors integrated with bandage

• Disposable
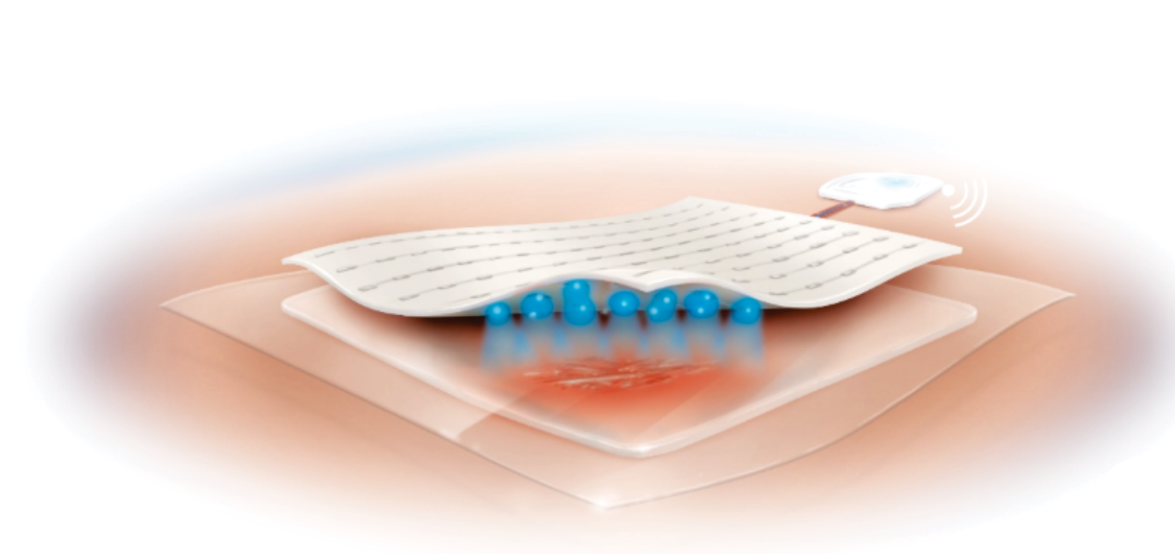
Process

• Recieve data from sensing module

• Process and transmit results to smartphone

• Sanitizable and reusable

Display

• Display results
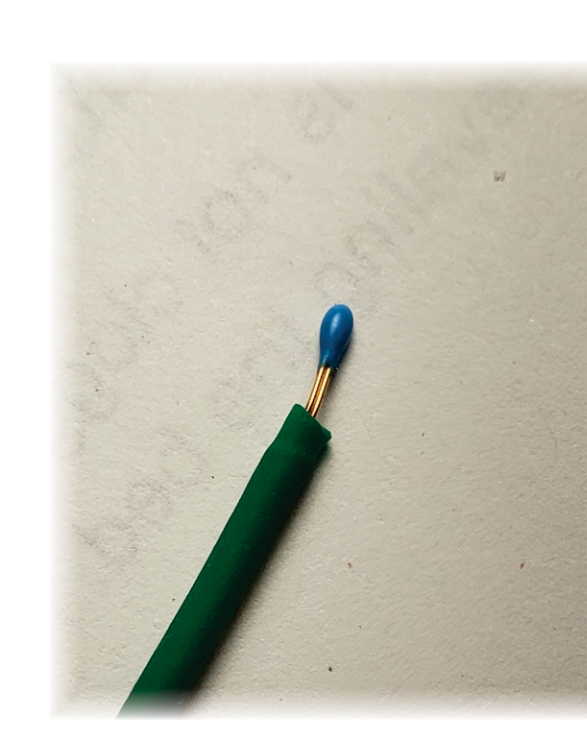
• Store data

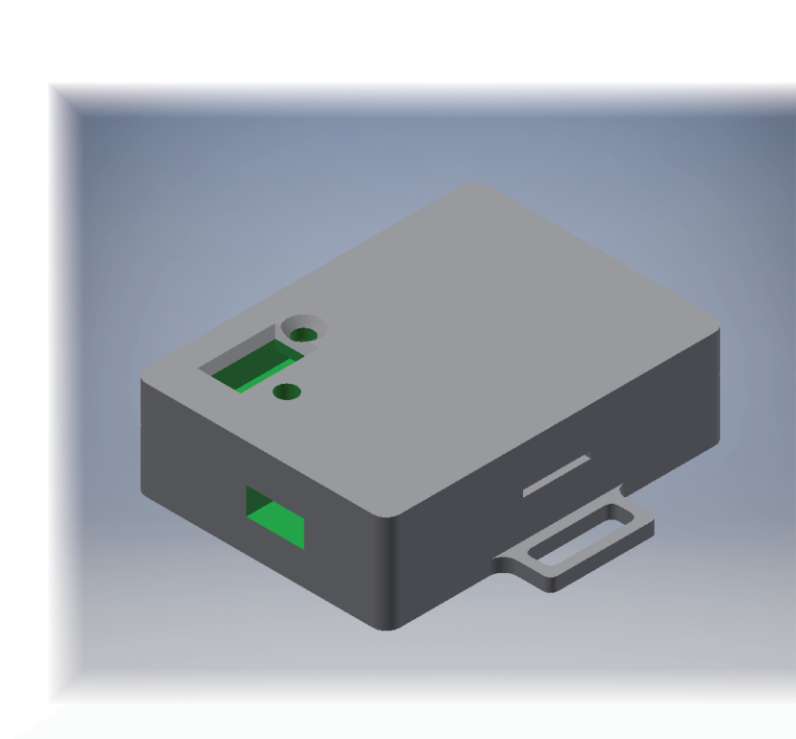Image from https://pxhere.com/en/photo/1201573

Sensor Calibration

• Temperature and pH sensors were calibrated using standardized procedures.

• Temperature sensors were accurate to +/- 0.63°C pH sensor was accurate to +/- 0.18pH (in expected human pH range)
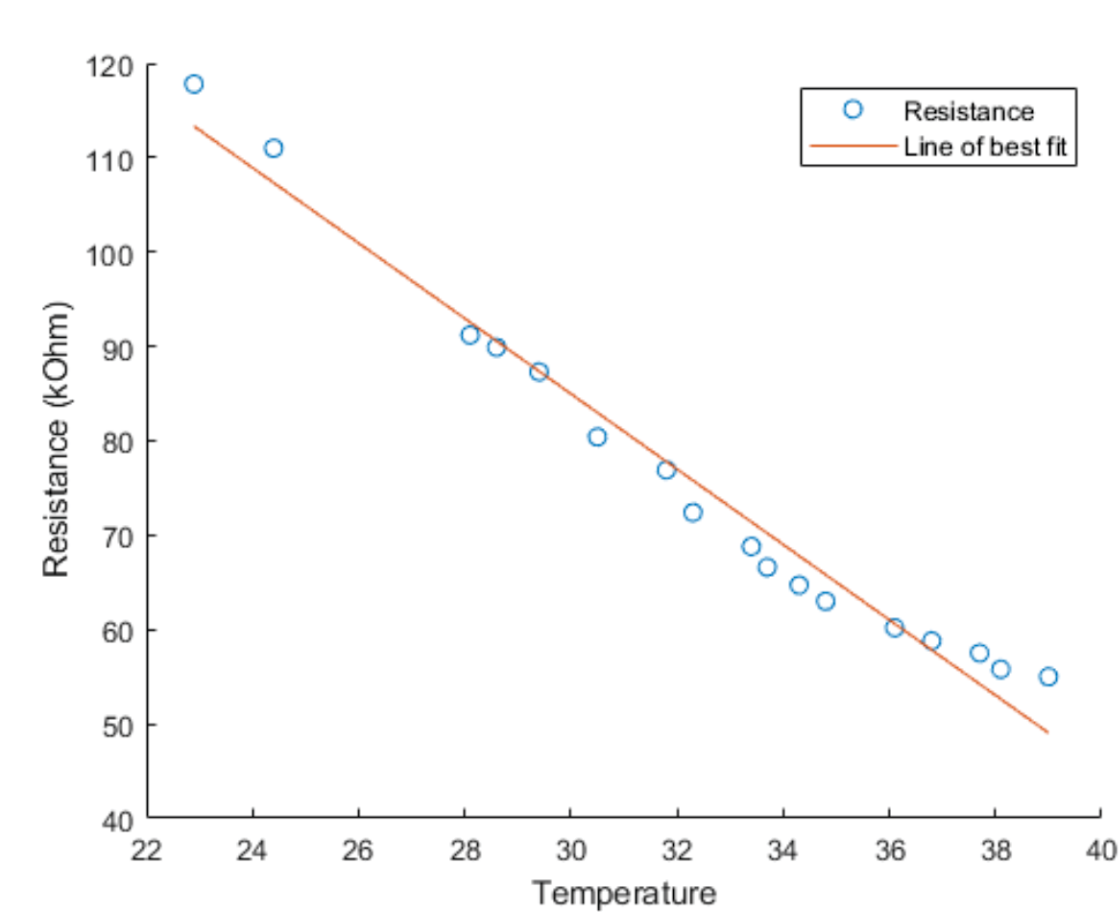
System Components

Thermistor — Sensor Case — pH Sensor

pH Calibration

pH	Average Reading (mV)	Error (mV)
4	57.48	2.44
7	-31.00	1.39
10	-89.06	8.95

Thermistor Calibration

Future Recommendations

• Add moisture and lactate sensors
• Reduce PCB footprint
• Encrypt data being sent from PCB to smartphone
• Improve response time of sensors
• Have more beers at Brass Taps
• Improve sensor connector

Advisor: Dr. Gordon Hayward P.ENG
Special thanks: Dr. Milad Afshar, Visaacan Rathiraj, Dr. Debbie Wu, Farhana Abbas

UNIVERSITY of GUELPH

ENGINEERING

Biomedical

Systems and Computing

Works Cited
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[2] C.P.S. Institute, [Online]. Available:http://www.patientsafetyinstitute.ca/en/toolsResources/Hospital-Harm-Measure/Documents/Resource-Library/HHIR%20Post%20Procedural%20infections.pdf
[3] G. Tegl, D. Schiffer, E. Sigl, A. Heinzle, and G. M. Guebitz, "Biomarkers for infection: enzymes,microbes, and metabolites,"Applied Microbiology and Biotechnology, vol. 99, no. 11, pp.4595-4614, 2015.