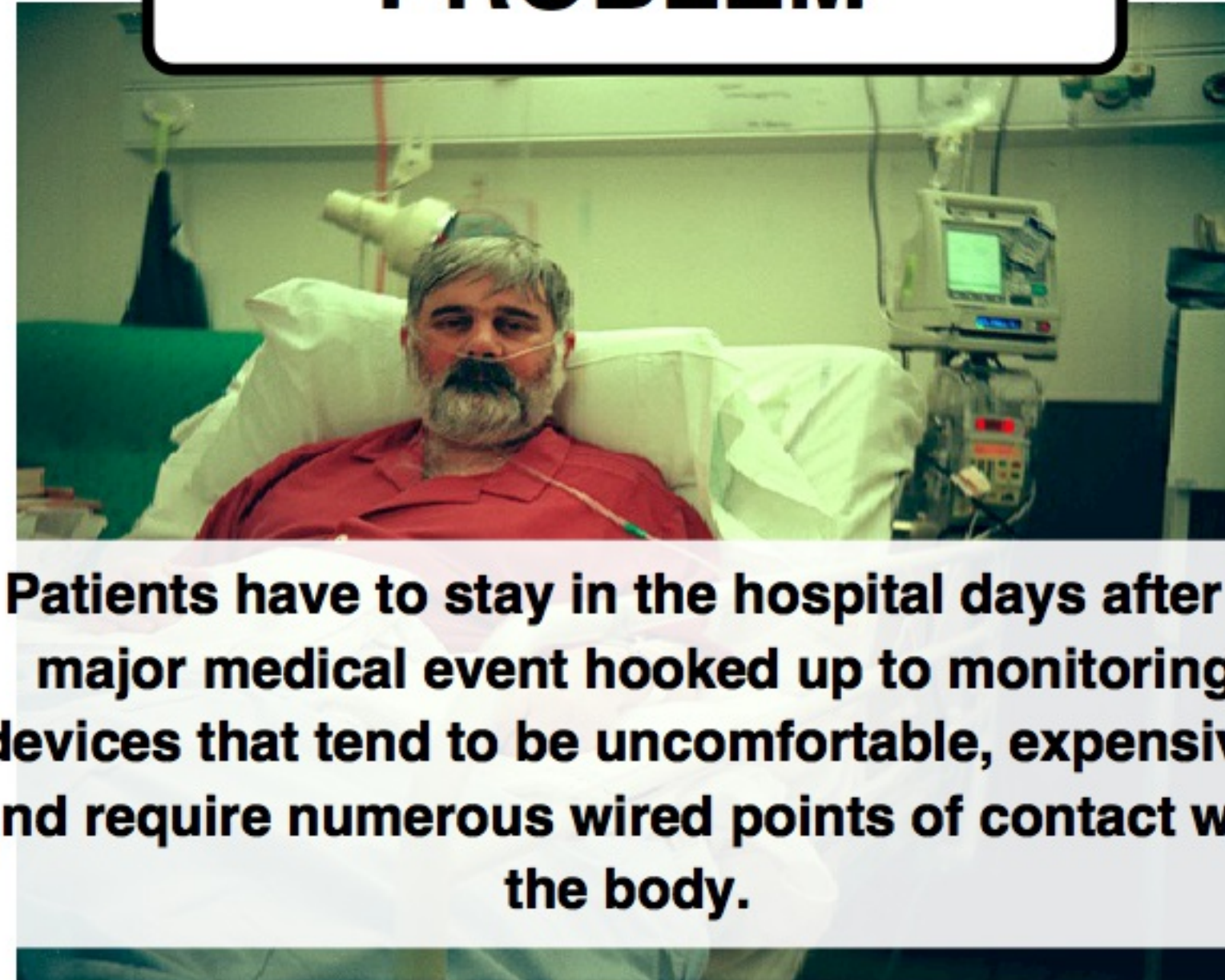# Tufts
UNIVERSITY
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Wireless Body Sensor Network for Remote Monitoring

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PROBLEM

Patients have to stay in the hospital days after a major medical event hooked up to monitoring devices that tend to be uncomfortable, expensive, and require numerous wired points of contact with the body.

SOLUTION

Wireless remote monitoring allows the patient the freedom to move unhindered in the comfort of their own home and frees up hospital resources to handle more urgent matters.

Wireless Health Monitoring System

SENSOR NETWORK

Sensor patches take critical body function readings at relevant locations around the body.

- Key Specifications -

Temperature Sensor: transmits temperature reading every 5 minutes
Pulse Oximeter: transmits Beat Per Minute reading every minute.

MOBILE PHONE

Mobile phone provides physiological and vital data to medical professionals and alarms in the event of an emergency.

- Key Specifications -
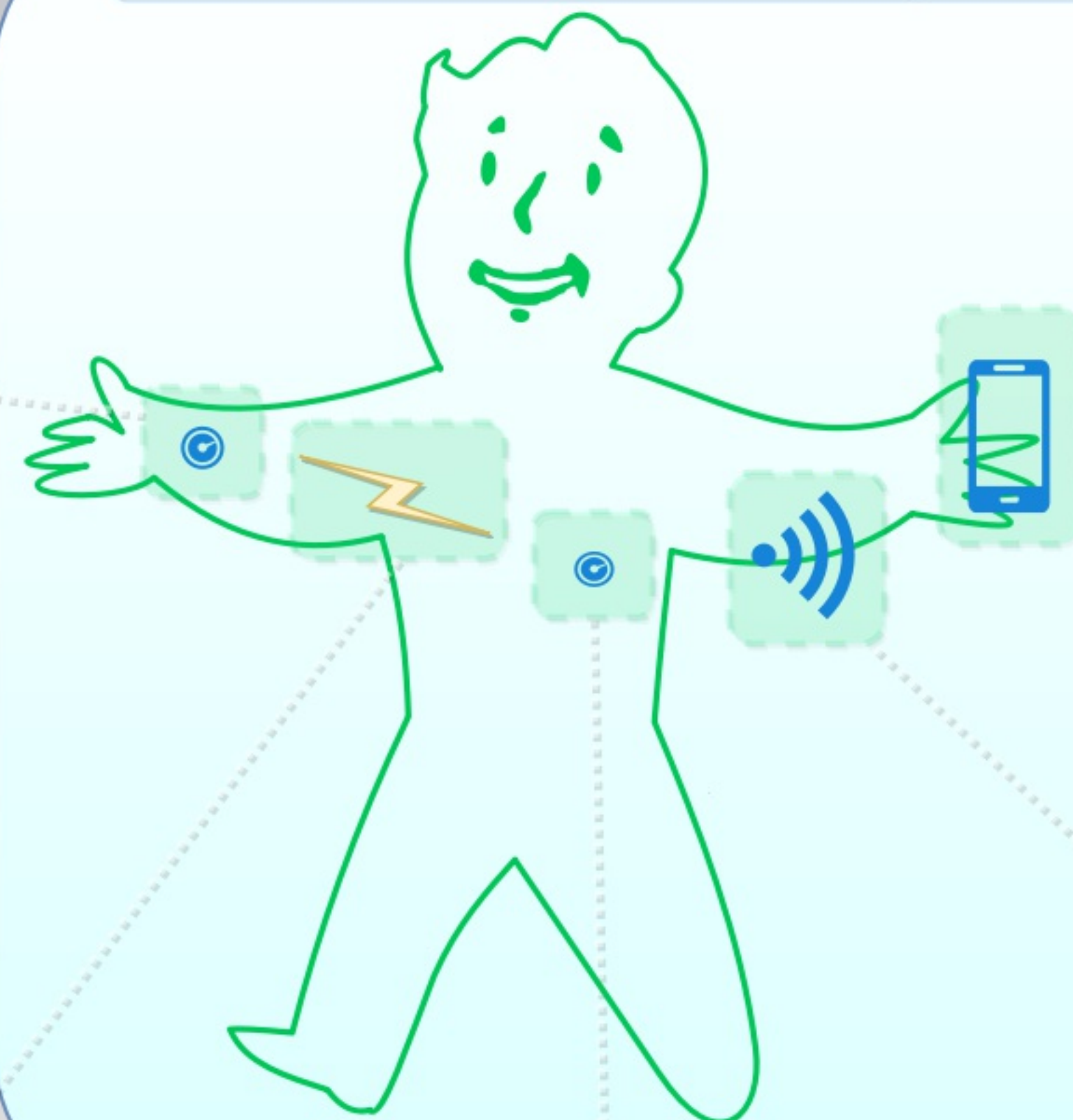
iOS app for monitoring patient vitals

INTRA-BODY CHANNEL

Sensor patch sends collected data to a central node using human skin as the communication medium.

- Key Specifications -

Physical Layer: Galvanic coupling over intra-body channel
Communication Protocol: Binary Frequency Shift Keying (BFSK)
Carrier Wave: 100KHZ Square Wave
Timing Synchronization: Preamble pattern matching

CENTRAL NODE

Central electrode collects and pre-processes sensor readings

- Key Specifications -

Demodulation Scheme: Active Band Pass Filter followed by an envelope detector

BLUETOOTH® LINK

Central electrode sends data to mobile phone via Bluetooth.

- Key Specifications -

Protocol: Bluetooth Low Energy (BLE)