

Story

People who have a medical instrument(s) surgically inserted to their bodies like pace makers, shunts, stent etc. often must undergo corrective surgery when the device stops functioning. For patients, whose body is completely dependent on such devices, device malfunction can be fatal. By monitoring critical data from the device, doctors, patients and family members will be able to monitor and assess situation in real time. This will help the patient and family members live a stress-free life. If surgery is needed, then Doctors can plan for it in advance and patients will not have to live through the pain.

The story idea has been inspired by near death experience of a family member who is completely medical device dependent. As per the on-call surgeon if there was an easy and proactive way to know that the device is malfunctioning, situation wouldn't have been so critical.

Dr. Prity Hanson

Surgeon



“Good health and well-being of my patients is top most priority with a focus on preventive care.”

About

- MD,45 years old and has been practicing for 21 years.
- Head of the Surgery department in the University associated with the Hospital where she practices and leads key research initiatives.
- Supports patients visiting the ER who need surgery immediately.
- Visits hospital in-patients and others via scheduled appointments.

Responsibilities

- Order tests for nurses or other healthcare staff to perform.
- Review test results to identify any abnormal findings.
- Recommend and design a plan of treatment.
- Address concerns or answer questions that patients have about their health and well-being.
- See and evaluate preoperative and postoperative patients for follow-up in the clinic.

Needs

- I need to know if the patient is critical as soon as possible and if the current condition is due to an existing condition.
- Need to know if a medical instrument is malfunctioning.
- Need to know of any other complications that patient may have to prescribe a course of treatment.

Main Goals

- Serve as both a catalyst and spokesperson in the community for prevention, diagnosis and treatment.
- Make an immediate positive impact on a patient’s well-being.
- Counseling patients and their family to ensure their understanding of the disease, diagnosis, treatment, and prognosis.

Pain Points

- Patient needs to undergo various tests to spot the trends. This is time consuming and in severe cases can be the difference between life and death.
- Must go through patient medical history to find out what kind of device was installed and what is the life expectancy of the device etc. This is a reactive response to patient complaint.
- Patient or/and family members must fill lots of forms. Medical staff needs to go through lot of paperwork.

Point of View

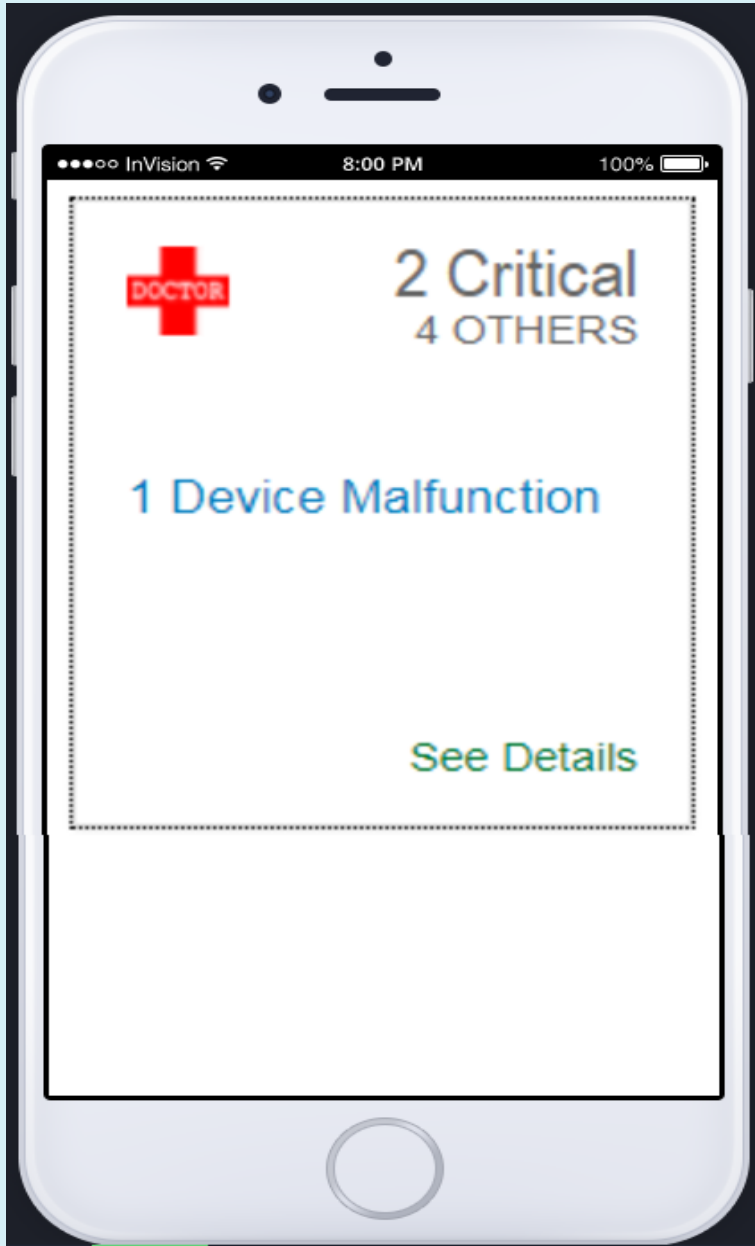
As a **Doctor**, I need a way to *know proactively* if medical device on my patients is malfunctioning so that *I can make a timely decision and prevent critical cases.*

User Experience Journey

<p>ACTIONS</p>	<ul style="list-style-type: none"> •Patient reports into ER •Doctor goes through Patient form 	<p>Review Medical history</p>	<p>Recommend tests</p>	<p>Analyze test results</p>	<p>Recommend treatment options</p>	<p>Schedule follow up visits</p>
<p>MINDSET</p>	<p>“What’s going on?”</p>	<p>“Are the current symptoms related to previous condition? Could the medical device be malfunctioning?”</p>	<p>“Hope it is not serious!”</p>	<p>“Wish I knew that device was having issues. Situation would not have been so critical.”</p>	<p>“You will need a corrective surgery as soon as possible.”</p>	<p>“Recovery is on track!”</p>
<p>FEELING</p>	<p>😊</p>					
<p>TOUCH POINTS</p>	<ul style="list-style-type: none"> •Computer •Forms •Patient & Family 	<ul style="list-style-type: none"> •Computer •Medical charts •Patient history 	<ul style="list-style-type: none"> •Computer •Medical staff •Patient 	<ul style="list-style-type: none"> •Test Results 	<ul style="list-style-type: none"> •Patient & Family •Medical Staff •OT 	<ul style="list-style-type: none"> •Patient & Family • Medical Staff

Prototype

Build Link: https://standard.build.me/prototype-editors/api/public/v1/snapshots/c7656dad7b8e72730e1fbcf1/artifacts/latest/index.html#/page_1



In the home screen the Doctor gets notifications about his patients on his Mobile device.

In this example, there are total of 6 alerts received. 2 of them are for critical patients and 1 of them is related to malfunctioning device.

Doctor can view more details of the patient and the malfunctioning device by pressing "See Details".



This page presents critical information about the patient and the device.

Device status and control parameters like the pressure on the brain and fluid flow are monitored for VP SHUNT patient. When the device malfunctions, the threshold values are exceeded and an alert is sent to the doctor.

Also, patient info like last surgery date and complication help in quick decision making. The doctor can even look up medical history for more details.

With the help of the above information the Doctor can take 3 decisions:

1. Notify the patient
2. Notify her medical staff
3. Notify the vendor for new device/feedback

These are presented as buttons at the bottom of the screen. It helps in providing a proactive solution to otherwise a reactive problem in which the doctor must wait for the patient to report issues with their medical device.

Detail Screen – Desktop View:

SMART MEDICAL DEVICE - openSAP IoT Challenge



Patient: Anish Budhiya
 DOB: 16 Sep 1971
 Condition: Pseudo Tumor
 SHUNT DEPENDENT
 Complication: Type 2 Diabetes
 Last Operated on : 21 Oct 2016

Device Status: Malfunctioning



Device Type: Med VP Shunt

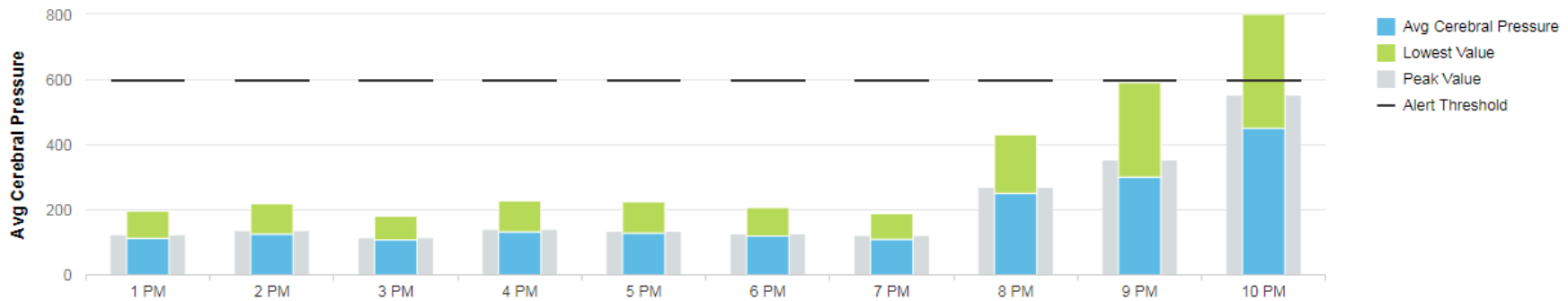
Device Id: A345X178243



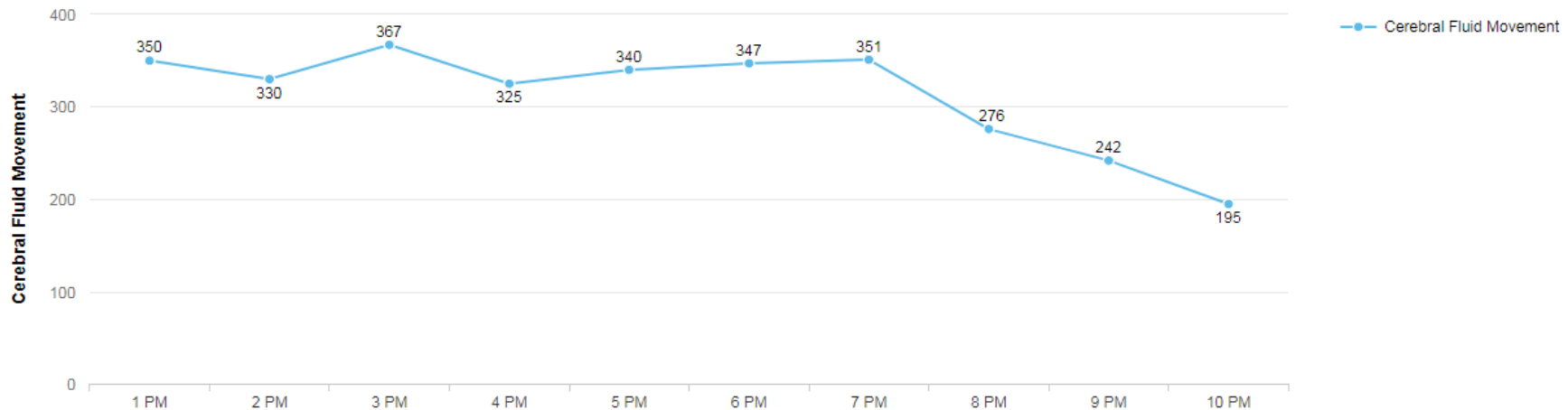
Medical History

Placement: Right side of the brain

Vendor: Med Electricals



Hourly Data



Hourly data



Notify Patient



Notify Medical Staff



Notify Vendor