CARE DELIVERY WORKFLOW ATTACKS THROUGH BEHAVIORAL EMANIPULATION

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Behavioral eManipulation

Technical Exploit + Human Behavior = Harm
Agenda

1. Context
2. Attack Anatomies
3. Remedies
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A Surgeon’s Perspective
Attacking Active Devices

- Insulin Pump
- Medication Infuser
- Defibrillator
Attacking Active, Passive, & Workflow

- Insulin Pump
- Medication Infuser
- Defibrillator
- Imaging
- Patient Monitors
- Medication Monitors
- Communication
- EMR
- Live Data Analysis
- Courier
- Pharmacy
- Transition of Care
- Nursing
- Physician
- Ancillary
Air France Flight 447
Rio Di Janeiro to Paris
2009
Agenda

1. Context
2. Attack Anatomies
3. Remedies
Hacking Hospitals

24 months, 12 healthcare facilities, 2 healthcare data facilities, 2 healthcare technology platforms, and 2 active medical devices

ONE Blueprint to secure healthcare assets

securityevaluators.com/hospitalhack

Digital attacks = patient harm?
Behavioral eManipulation: Attack Flow
Behavioral eManipulation: Methodology

1. Understand the care **workflow**
2. Manipulate **data**
3. Rely on **humans** to unwittingly deliver harm
Diagnostic Attack Scenarios

System of Safety Checks

Data Interpretation
Examples: Attacking System of Safety Checks

Blood

Allergies
Attacking System of Safety Checks
Diagnostic Attack Scenarios

System of Safety Checks

Data Interpretation
Examples: Attacking Data Interpretation

Monitoring

Labs
Attacking Data Interpretation
Fearmongering?

1) Who would even want to do this?
2) Why?
Patient Health v. Patient Data

HARM
FEAR
DISRUPTION/WARFARE

PROFIT
Agenda

Context

Attack Anatomies

Remedies
Areas For Improvement

Secure Devices

Train Medical Professionals
Think Like An Attacker Thinks
Threat Model

ASSETS ➝ ADVERSARIES ➝ ARCHITECTURE

- Card
- Dollar
- Folder
- Hacker
- Hacker
- Firewall
- Server
Recognize Role of Compliance

HIPAA
The Health Insurance Portability and Accountability Act of 1996

FDA
Apply

Solution lies primarily with **Device Manufacturers**

- Design & Implement **Threat Model**
- Design & Implement **Trust Model**
- Partner with **security experts**
  - Perform **Security Assessments**
  - Think like **Attacker**
  - Build security into **Design**