RSAConference2019
San Francisco | March 4–8 | Moscone Center

SESSION ID: MBS-W12

Hacking Healthcare Live: Digital Disease, Clinical Crisis

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I Am The Cavalry

The Cavalry isn't coming... It falls to us

Problem Statement

Our society is adopting connected technology *faster than we are able to secure it*.

Mission Statement

To ensure connected technologies with the potential to impact public safety and human life are *worthy of our trust*.

Medical

Automotive

Connected Home

Public Infrastructure

Why Trust, public safety, human life
How Education, outreach, research
Who Infosec research community
Who Passionate volunteers
What Long-term vision for cyber safety

Collecting existing research, researchers, and resources

Connecting researchers with industry, media, policy, and legal

Collaborating across a broad range of backgrounds, interests, and skillsets

Catalyzing positive action sooner than it would have happened on its own

Atlantic Council

College of Medicine
Phoenix

CyberMed Summit June 8-9, 2017

"No one has ever died from a hacked medical device."

- Doctors don't look
- Investigators aren't trained
- Data doesn't exist

…how would you know?

Atlantic Council

College of Medicine
Phoenix

CyberMed Summit June 8-9, 2017

NEWS MAY 17 2017, 9:39 AM ET

Why 'WannaCry' Malware Caused Chaos for National Health Service in U.K.

by ALEXANDER SMITH, SAPHORA SMITH, NICK BAILEY and PETRA CAHILL

An ambulance worker at an NHS hospital in London on Friday. Andy Rain / EPA

The NEW ENGLAND JOURNAL of MEDICINE

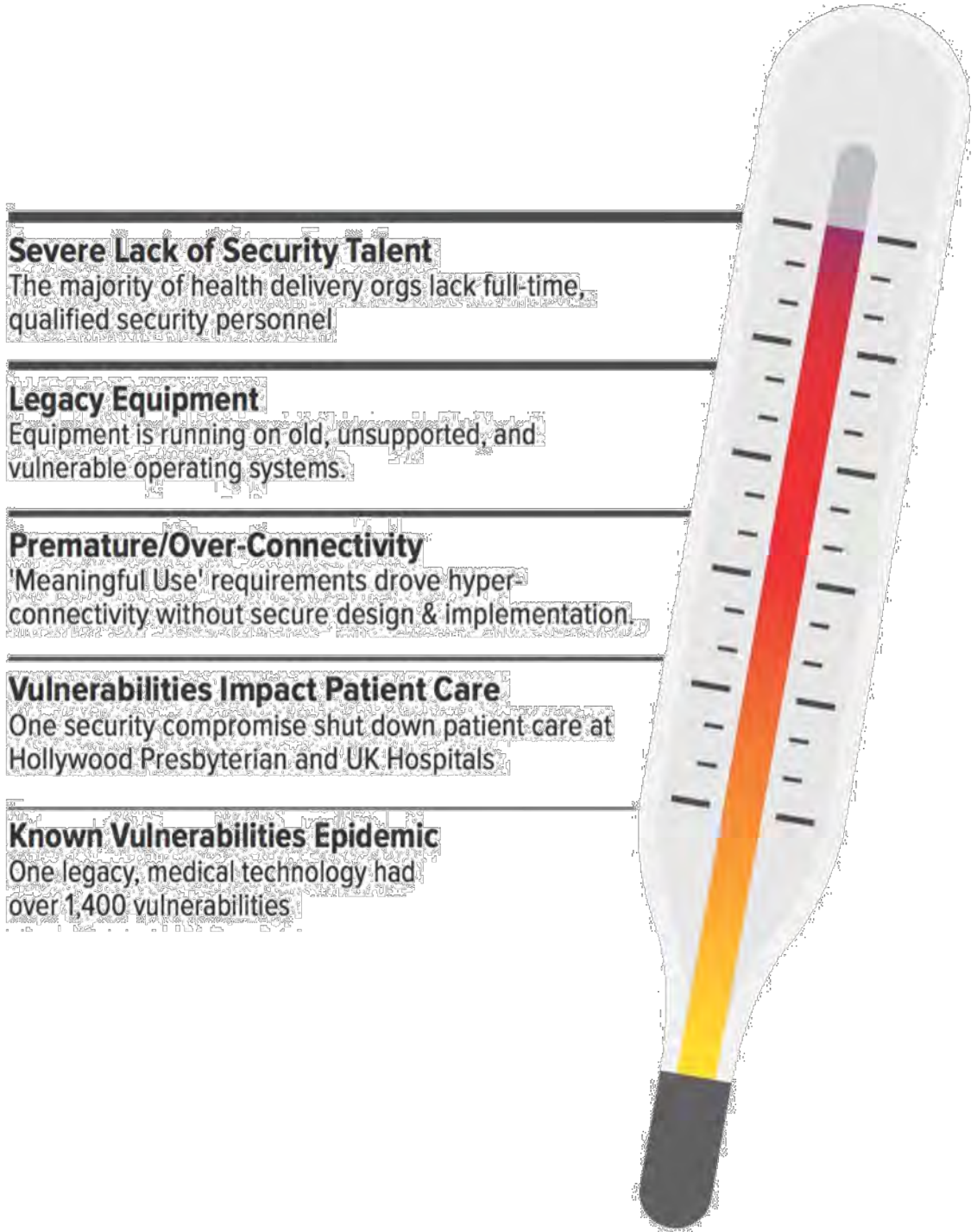
SPECIAL ARTICLE

Delays in Emergency Care and Mortality during Major U.S. Marathons

Anupam B. Jena, M.D., Ph.D., N. Clay Mann, Ph.D., Leia N. Wedlund, and Andrew Olenski, B.S.

ABSTRACT

Healthcare Cybersecurity is in Critical Condition



Source: US Department of Health and Human Services
Health Care Industry Cybersecurity Task Force
Report On Improving Cybersecurity In The Health Care Industry, June 2017
https://www.phe.gov/preparedness/planning/CyberTF/Pages/default.aspx

The single biggest risk to the health of future generations is trust and trustworthiness of care delivery.

A Hippocratic Oath for Connected Medical Devices

I will revere and protect human life, and act always for the benefit of my patients. I recognize that all systems fail; inherent defects and adverse conditions are inevitable. Capabilities meant to improve or save life, may also harm or end life. Where failure impacts patient safety, care delivery must be resilient against both indiscriminate accidents and intentional adversaries. Each of the roles in a diverse care delivery ecosystem shares a common responsibility: As one who seeks to preserve and improve life, I must **first do no harm**.

To that end, I swear to fulfill, to the best of my ability, these principles.

- **Cyber Safety by Design:** I respect domain expertise from those that came before. I will inform design with security lifecycle, adversarial resilience, and secure supply chain practices.
- **Third-Party Collaboration:** I acknowledge that vulnerabilities will persist, despite best efforts. I will invite disclosure of potential safety or security issues, reported in good faith.
- **Evidence Capture:** I foresee unexpected outcomes. I will facilitate evidence capture, preservation, and analysis to learn from safety investigations.
- **Resilience and Containment:** I recognize failures in components and in the environment are inevitable. I will safeguard critical elements of care delivery in adverse conditions, and maintain a safe state with clear indicators when failure is unavoidable.
- **Cyber Safety Updates:** I understand that cyber safety will always change. I will support prompt, agile, and secure updates.

I Am The Cavalry

DEF CON BIOHACKING VILLAGE

I Am The Cavalry

⚠ WARNING ⚠

LIVE HACKING

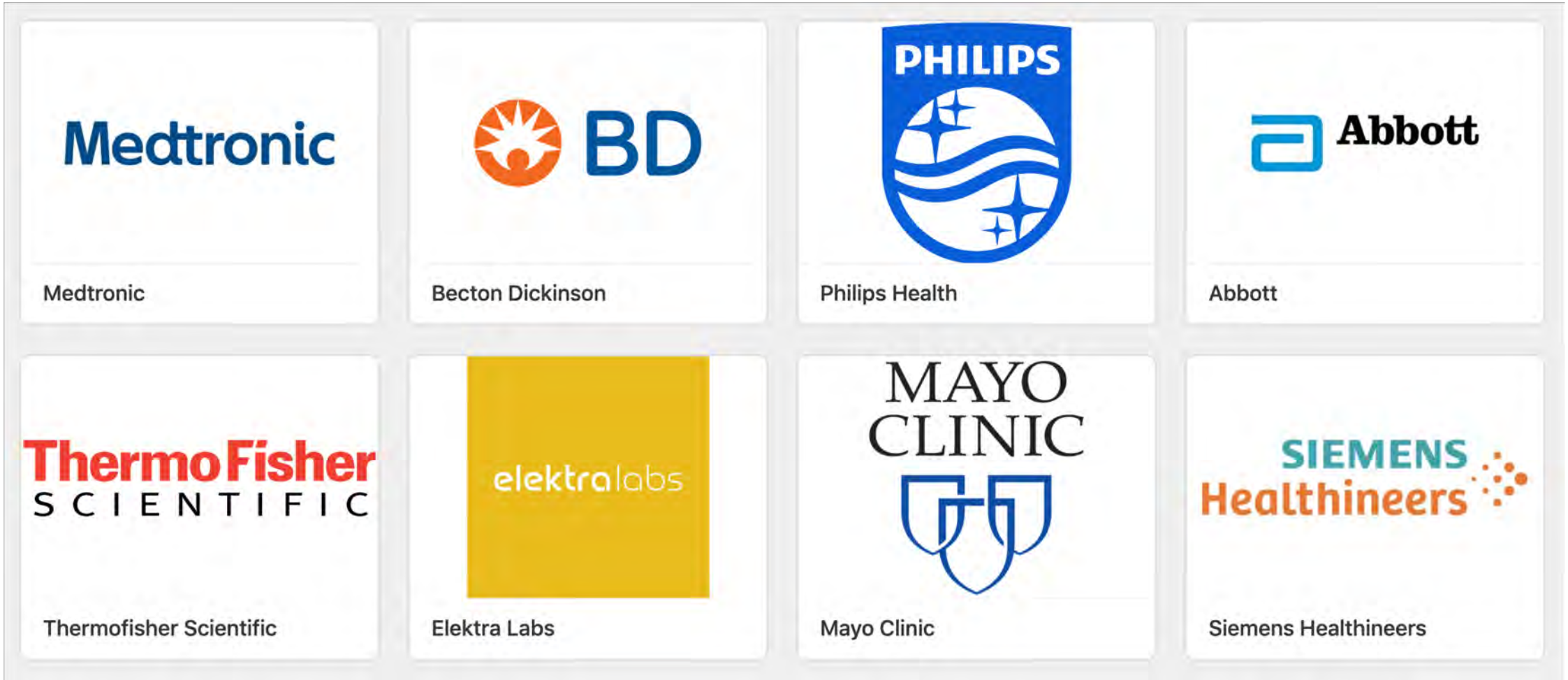
MEDICAL DEVICE SECURITY RESEARCH IN PROGRESS

MOST MEDICAL DEVICES ARE DESIGNED AND TESTED TO REDUCE RISK FROM FORESEEABLE HAZARDS. NO SECURITY WORKS PERFECTLY AGAINST ALL ACCIDENTS AND ADVERSARIES. **PATIENTS WITH CONNECTED MEDICAL DEVICES ENTER AT THEIR OWN RISK.**

DC-BHV-2018-001

@IAMTHECAVALRY @DC_BHV

#We Hackers


Medtronic
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BD
Becton Dickinson
PHILIPS
Philips Health
Abbott
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ThermoFisher SCIENTIFIC
Thermofisher Scientific
elektralabs
Elektra Labs
MAYO CLINIC
Mayo Clinic
SIEMENS Healthineers
Siemens Healthineers

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Suzanne Schwartz

Center for Devices & Radiological Health – US Food & Drug Administration, Associate Director for Science & Strategic Partnerships

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Physician Debrief

“Apply” Slide

- Learn
  - FDA Safety Communications
  - JMIR article on Hippocratic Oath
- Participate
  - Clinical simulations and table top exercises
  - #wehearthackers
  - CyberMed Summit 2019
- Share with executives

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Thank you!

Resources

- JMIR article on Hippocratic Oath https://preprints.jmir.org/preprint/12568
- Nightline segment on CyberMed Summit https://abcnews.go.com/Nightline/video/fears-hackers-targeting-hospitals-medical-devices-48343190
- US HHS Task Force report on improving cybersecurity in the healthcare industry. https://www.phe.gov/preparedness/planning/CyberTF/Pages/default.aspx

Resources

- FDA pre-market and post-market guidance for medical device cybersecurity.
- https://www.fda.gov/downloads/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm356190.pdf
- https://www.fda.gov/downloads/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm482022.pdf
- https://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM623529.pdf

Resources

- The Healthcare Sector Coordinating Council Joint Security Plan for securely developing medical devices. https://healthsectorcouncil.org/the-joint-security-plan/
- The Healthcare Sector Coordinating Council guidance for healthcare provider security https://healthsectorcouncil.org/hhs-and-hscc-release-voluntary-cybersecurity-practices-for-the-health-industry/