

Secure and Intelligent Implantable Medical Devices



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RFID
JOURNAL
LIVE!**track and manage everything****APR. 8-10**
201412TH ANNUAL CONFERENCE AND EXHIBITION
ORANGE COUNTY CONVENTION CENTER
ORLANDO, FLA.

- “Health Care / Pharmaceutical” - Industry Track:
 - „Hospital Expands RTLS Usage Beyond Asset Management“
 - “Hospital Improves Hand-Hygiene Compliance With RFID”
 - “Improving Patient Outcomes and ROI With RFID”
 - “Hospital Identifies Recalled Drugs Via RFID”
 - “Improving Infusion Pump Usage and Utilization With RFID”
 - “NFC Assists Hospital in Administering Medication”

- <http://www.rfidjournalevents.com>



RFID IN HEALTH CARE

Dec. 4, 2013 • Georgetown University Hotel & Conference Center • Washington, D.C.

- Will be in Chicago in December 2014
 - Hear early adopters share the results of real-world deployments
 - Get answers to your questions regarding the benefits that can be achieved
 - Gain valuable insights into the proper RFID technologies to employ for various applications
 - Learn best practices and find out how to avoid common pitfalls
- <http://www.rfidjournalevents.com/healthcare>

ARCHIMEDES



ARCHIMEDES

ANN ARBOR RESEARCH CENTER
FOR MEDICAL DEVICE SECURITY

- Research action in the US
 - Focuses on research and education to improve (RFID-based) medical device security

- Involvements:

- University of Michigan
(Director: Prof. Kevin Fu)
- Harvard Medical School/
Clinical Research Institute
- University of Washington
- University of Tennessee



- <http://secure-medicine.org/>

Related Initiatives in the US

■ SHARPS Project

- Huge consortium...
- United States Department of Health and Human Services (HHS)
- National Coordinator for Health Information Technology (ONC)



SHARPS

Strategic Healthcare IT
Advanced Research
Projects on Security

■ RFID Consortium for Security and Privacy (RFID-CUSP)

- University of Massachusetts
- Georgetown University
- ETH Zurich
- RSA Labs



SMART-IMDs

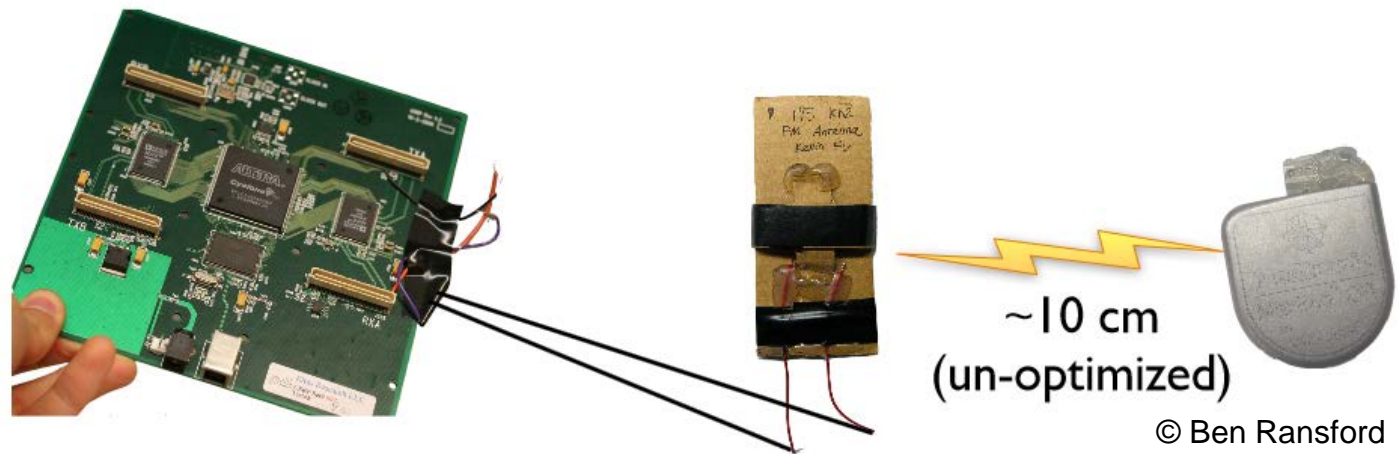


- Planned research project entitled:
“Secure and Intelligent Implantable Medical Devices”
- → Action aims to develop secure, reliable, and smart IMDs
 - Pacemakers, implantable cardiac defibrillators (ICDs), drug pumps, neurostimulators, etc.
- European consortium:
 - Spain, UK, Czech Republic, Sweden, Belgium, Austria, Slovakia, Turkey, Greece, Germany, The Netherlands, Norway

Practical Example 1

2008: Halperin et al. showed that adversaries can:

1. Read and change information stored in ICD memories!
2. Turn them off!
3. Issue life-threatening shocks!



Attack #2: Eavesdrop Private Info

Implanting physician

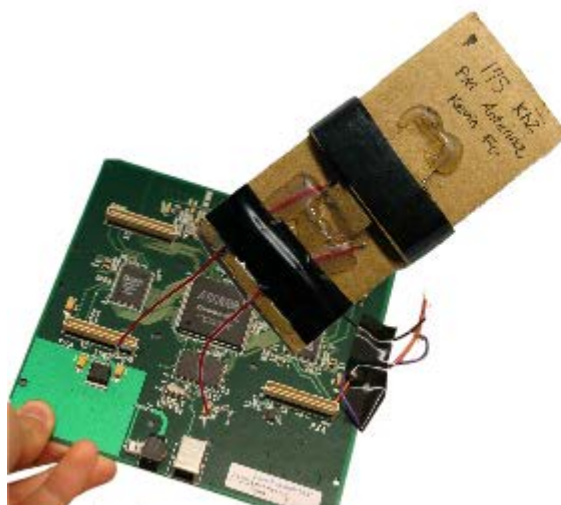
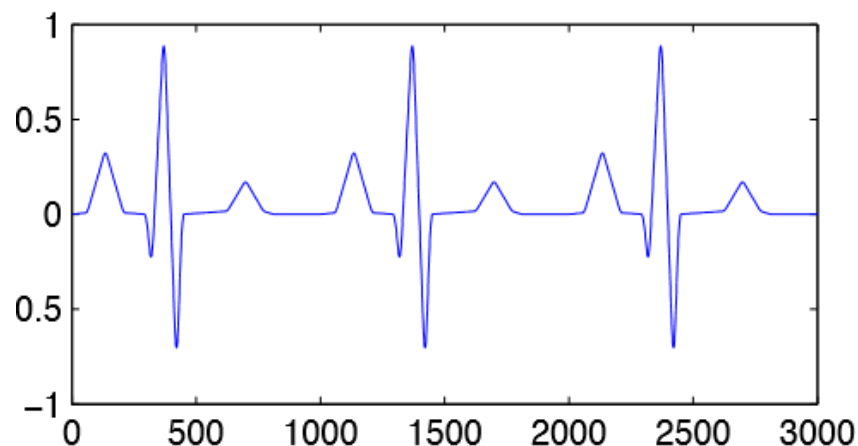
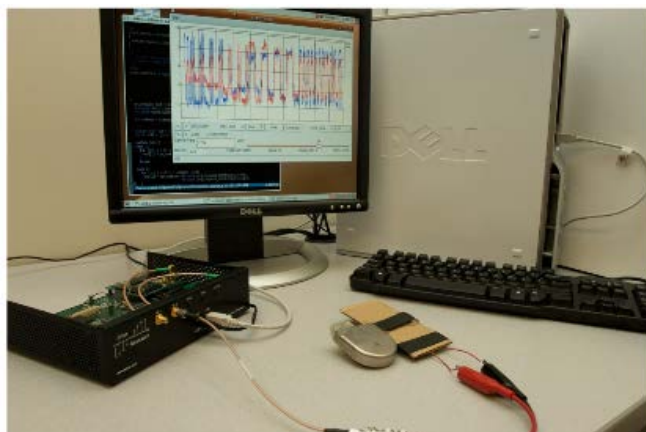
Diagnosis

Hospital

Also:
Device state
Patient name
Date of birth
Make & model
Serial no.
... and more

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Sniff Vital Signs or Drain Energy



“Are you sleeping?”



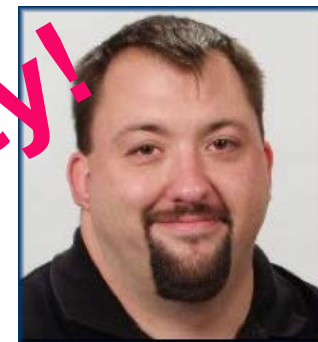
“No!”



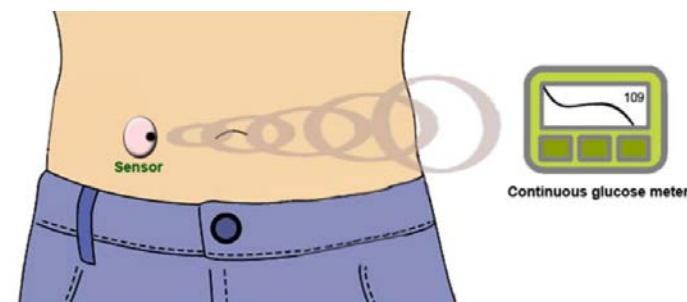
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Practical Example 2 – “Insulin Al Qaeda”

2011: Jay Radcliffe: commercial insulin pumps have wireless connectivity but **no security** protection mechanisms!



He identified flaws that could allow an attacker to **remotely control insulin pumps** and **alter the readouts of blood-sugar monitors**



© Jay Radcliffe

https://media.blackhat.com/bh-us-11/Radcliffe/BH_US_11_Radcliffe_Hacking_Medical_Devices_Slides.pdf

Taiwan Information Security Center (TWISC)

- Part of the National Taiwan University of Science and Technology (NTUST)
- Prof. Nai-Wei Lo – Director of the Integrated Digital Services Laboratory (IDSL)
- RFID Activities:
 - Integration of RFID technology with health-care management systems
 - User privacy
 - „Medicine dispatching safety and inpatient/outpatient clinic”
- <http://idsl.cs.ntust.edu.tw/director>



fast
forward
4you

RFID-Hotspot Steiermark

Der Einsatz von RFID im Health-Sektor

Thanks for your attention!



Secure Entities for Smart Environments

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