

Testing Potential Interference with RFID Usage in the Patient Care Environment

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About Me

- Senior, Purdue School of Engineering & Technology – Electrical Engineering Technology
- Graduate in May 2009
- Student Ambassador
- Student Council Representative
- IUPUI Top 100 Student
- Internships
 - Mussett, Nicholas & Associates – Current
 - Mundell & Associates – Summer 2007

RFID – Brief Overview

- Radio Frequency Identification
- Used widely in Inventory Management
- Modern replacement for Bar Codes
- Uses EPC – Electronic Product Code
- Process
 - Antenna sends out signal
 - Tag receives signal – changes to power
 - Tag sends information back to antenna
 - Antenna sends information to computer

How the Project Started

- Blue Bean RFID – Company request for disposable tracking application in hospital
- January 2008 – No RFID testing applicable to hospital patient's room
- MURI (Multidisciplinary Undergraduate Research Institute) – Contacted in February 2008
- Opportunity to work with other engineering fields to learn something new

People Involved

- Dr. Akay – MURI Director
- Gregg Maggioli – Blue Bean RFID President
- Barbara Christe – BMET Program Director
- Elaine Cooney – ECET Faculty Member
- Robert Frye – EET Student
- Dustin Doty – BMET Student
- Jason Short – MET Student

Testing

- Tested using multiple types of common RFID tags with both high and low-power antennas
- Varied the distance between the device and the antennas (1, 2, 4, and 6 feet)
- Tested for interference 1,600 times
 - 4 distances per antenna test repeated 8 times for 2 antennas
 - 5 devices per type
 - 5 types of devices
- Observed device behavior for operational differences

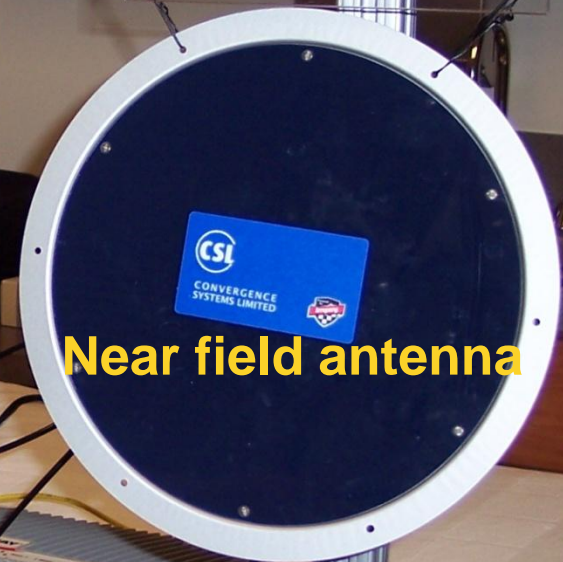
Devices Tested

- NIBP (Non-Invasive Blood Pressure)
- Pulse Ox Monitor
- Sequential Compression Device
- IV Pump
- Cardiac Monitor (3 Lead)

Far field antenna



Near field antenna



Computers to verify tags



Results

- No performance alterations in all 1,600 tests
- Evaluated a 12 lead EKG device and noticed interference at 6 inches from antenna
 - Not in scope of project
 - Not typically around antenna
- Preliminary research indicates RFID is safe for the patient's room
- Total cost of project was \$6,100

marquette

Press 'L6' to record on L6.

II Rucle Trezor

10:19:03
10-Mar-2008

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BPM



Summary

- No study will closely mimic your specific case – endless combinations of antennas, tags, devices, physical orientation of system components, etc.
- Assume there will be interference in certain conditions, so know what your conditions are
- Before any action is taken, have your situation professionally evaluated

Questions

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