The Need to Partner with Your IT Department

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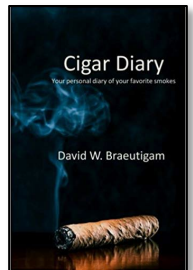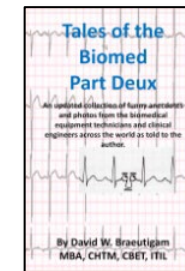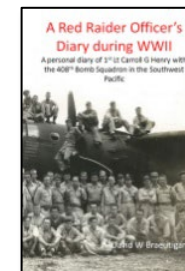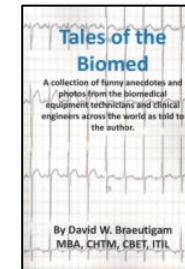
MDEXPO

SoCal • October 11-13, 2022

About Me

- 40+ years in healthcare technology management
- HTM Consultant, author and educator
- Helped write the CHTM test for AAMI
- Served on lots of AAMI committees
- Treasurer and past President of HTMA-NTX
- Written several books and working on several more on a WIDE variety of topics
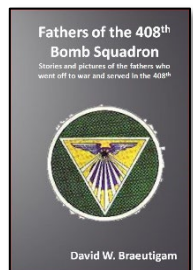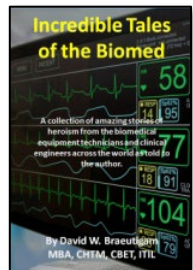
Experience with IT

- Reported to IT at large healthcare system for 15 years
- Learned a lot about how IT operates
- Obtained A+ certification, Microsoft Networking certification and ITIL
- Trained staff on A+ and Net+ at last healthcare system
- I'm the CIO and CISO of my home network 😉

Objectives

- Learn how to better communicate with IT
- Understand more about IT
- Learn how IT and Biomed differ
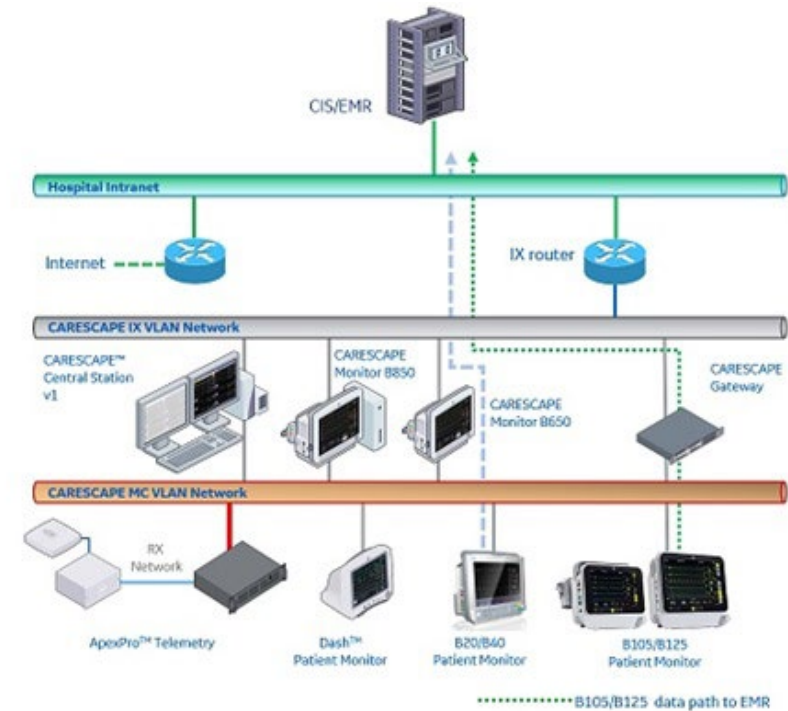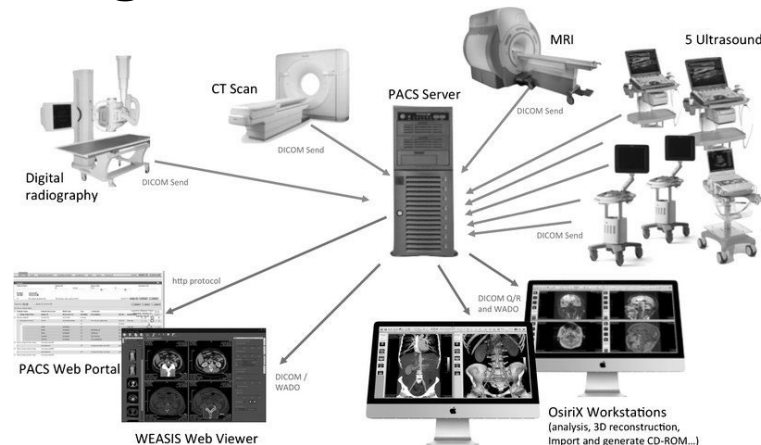- Understand what IT needs from Biomed

Let This Be Interactive

- If you have a question or comment don't hesitate to ask
- If you have an example of how you are addressing a problem, please share

Why am I Certified in IT?

- I've built and understand computers (Macs and PCs)
- I realized I did NOT understand networking, so I went to school to get training and certification
- Even in the early 1990's patient monitoring was on a network and even some early anesthesia machines were PC based!
- If you are getting trained why not get the certification?
- Many employers now look for IT certification
  - Several hospitals in the DFW area require CBET and/or IT certifications to be a BMET II

Why Do We Need to Work with IT?

- 50% or more of our medical equipment is connected to a network or to the internet
  - IV pumps
  - Imaging
  - Patient Monitoring

https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-medtech-iomt-brochure.pdf

Within 5 years 75% of Medical Devices **Sold** Will be Connected

Anatomy & Physiology

- Why did we learn anatomy & physiology in school?
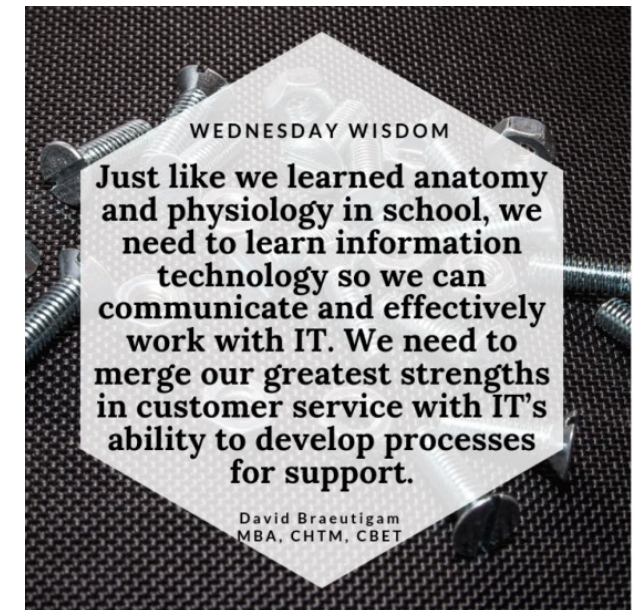 - A&P is the fundamental building block of medical practice
  - We learn about the structure of the body
  - We learn about the internal organs and tissues
- We learn medical terminology to understand and communicate with clinicians
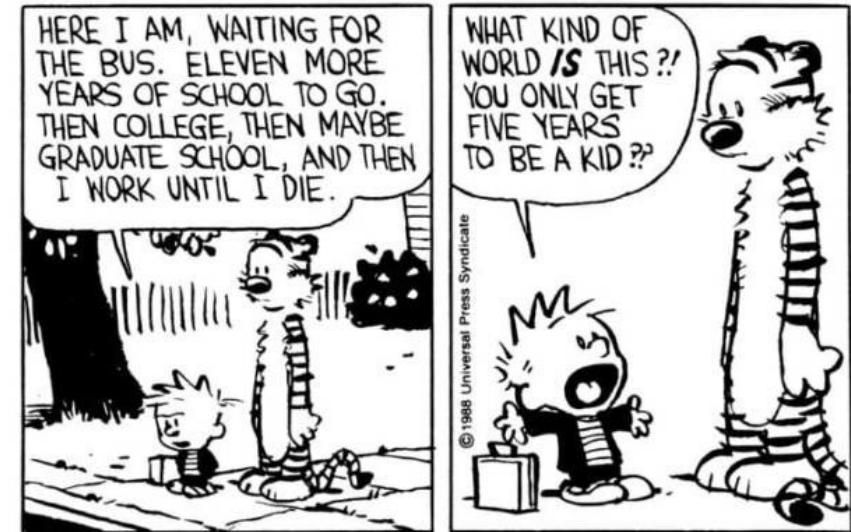
IT Communication

- What does an ***incident*** mean to IT?

  – *an unplanned interruption to an IT service or reduction in the quality of an IT service or a failure of a Configuration Item that has not yet impacted an IT service (for example failure of one disk from a mirror set)*

- What does an incident mean to Biomed?

- Why don't we learn information technology to better communicate and understand IT?

WEDNESDAY WISDOM

Just like we learned anatomy and physiology in school, we need to learn information technology so we can communicate and effectively work with IT. We need to merge our greatest strengths in customer service with IT's ability to develop processes for support.

David Braeutigam
MBA, CHTM, CBET

https://en.wikipedia.org/wiki/Incident_management_(ITSM)

So, What Should We Do?

- Learn new skills
- Learn from IT and their best practices
- Learn from other healthcare systems

Prepare for the Future

- Get your CBET or CRES if you are a BMET
- Get your A+, Net+, and Sec+
- Finish a degree if you don't have your AAS
- Get your CHTM and ITIL if you in management
- Get a bachelor's degree if interested in management

- **You can't get these overnight so prepare for your future**

Learning Foundations for BMETs

- A+
  - Hardware
  - Operating systems and troubleshooting
  - Networking
  - Hardware and networking troubleshooting
  - Mobile devices
  - Security
  - Operational procedures

https://CompTIA.org

Learning Foundations for BMETs

- Net+
  - Networking concepts
  - Infrastructure
  - Network operations
  - Network security
  - Network troubleshooting and tools

https://CompTIA.org

Learning Foundations for BMETs

- Sec+
  - Threats, attacks and vulnerabilities
  - Technologies and tools
  - Architecture and design
  - Identity and access management
  - Risk management
  - Cryptography and PKI

https://CompTIA.org

Learning Foundation for Managers

- **ITIL – Information Technology Infrastructure Library** – a set of detailed practices for IT service management
- The ITIL service lifecycle consists of five practice areas or phases, with supporting principles, policies and processes within each phase:
  - **Service Strategy**: Service strategy principles address business processes, corporate governance and compliance, policies, corporate culture and decision-making, and ensure that the business is geared for service improvement.
  - **Service Design**: This phase includes the assessment of business management processes (service level, availability, capacity, etc.) to design and develop new service offerings or improve existing offerings.
  - **Service Transition**: This phase covers the transition from development to production operations, including testing and quality control.
  - **Service Operation**: This phase defines how to manage services once they're in production use. It addresses service operation processes, such as event management, access management, incident response, the application lifecycle and helpdesk support.
  - **Continuous Service Improvement**: This phase defines new requirements for the preceding phases of ITIL based on operational feedback and service levels. It helps to ensure that policies and procedures are followed, that service level agreements are met and that operational lessons learned are incorporated into existing and future service refinements.

https://en.wikipedia.org/wiki/ITIL

Additional Learning

- Webinars from AAMI, TechNation, 24x7, and vendors
- Trade shows like AAMI, MDExpo, and local HTM associations
- Subscribe to IT related subjects like Cybersecurity
- YouTube
- You can also manage your network at home
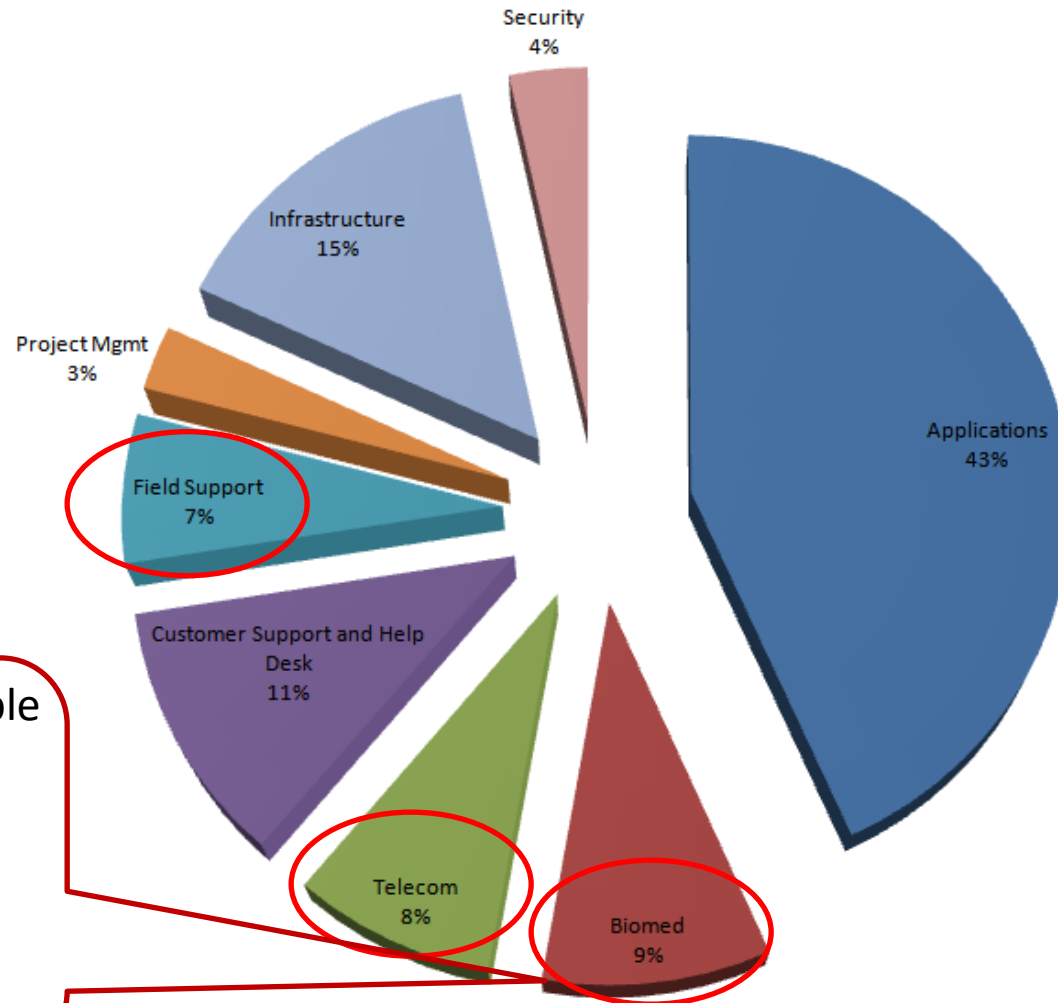 - BTW have you upgraded your firmware on your smart lights?

IT Education Comes Slow

- I've taken LOTS of IT classes, read lots of books, attended lots of webinars and I'm still confused sometimes by IT
- It takes **TIME** for the knowledge to take affect and for it to be common knowledge
- If you don't practice ANY new knowledge, you will lose it
- We weren't perfect BMETs right out of school – right?

Typical IT Structure

- CIO – Chief Information Officer
- CISO – Chief Information Security Officer - sometimes reports directly to the CIO but some believe should NOT report to IT
- Vice Presidents
  - Infrastructure
  - Security
  - Help Desk
  - Field Support and Telecom
  - PMO (Project Management Office)
  - Applications

Example of HTM and IT in large healthcare system

More than 500 applications:
- 3M/Softmed
- Abbott PoC
- Risk Management Database
- Apollo Cardiology
- Business Applications
- Chargemaster Database
- Cloverleaf
- DocuData
- Meditech
- Micromedex
- HR applications
- Microsoft Applications
- Lawson
- Clinical Dashboards
- Eclipsys (EMR)
- Patient Accounting
- PACS
- Pathology transcription
- LIS
- RIS
- QS Perinatal System
- Payroll
- GE MacLab
- Sleep Lab
- Provation GI Lab system

Pie chart segments:
- Applications 43%
- Infrastructure 15%
- Security 4%
- Project Mgmt 3%
- Field Support 7%
- Customer Support and Help Desk 11%
- Telecom 8%
- Biomed 9%

Biomed was responsible for all imaging, lab, biomed, nurse call, stretchers, beds, OR lights, OR tables, plus rigid & flexible scopes

HTM Structure at my former job

- Imaging
  - System Director and Managers
  - Imaging Engineers I and II
- Biomed
  - System Director, Regional Directors, and Managers
  - BMETs I, II, and Senior
- Clinical Engineering team
  - Database support
  - Project Management
  - Cybersecurity support

Reported to a VP of IT for 15 years then switched the last year to reporting to a VP in Supply Chain

IT and Cost Cutting

- IT is more project based than HTM
- ==If they need to cut costs, then they let a **governance committee** decide what projects to keep and which to cut==
  - Need to cut 10% of the budget?
    - Prioritize the projects and don't do the ones that exceed the new budget
    - The onus is on the governance committee

HTM and Cost Cutting

- You can't just let equipment lay around unrepaired, can you?
- Can you do less PMs?
- Can you implement an AEM strategy?
- Can you reduce coverage on contracts or eliminate contracts?
  - Instead of Gold coverage your get Bronze or Silver?
  - Bring service in-house instead of using contracts

IT and HTM COSR

- IT COSR (Cost of Service Ratio) is <mark>15-25% of asset value and is typically software only</mark>
- HTM COSR is typically <mark>5-6% and usually just hardware based</mark>
- We are seeing the IT COSR creep into the HTM space!!
  - Additional cost of Cybersecurity
  - Additional cost of application support

*COSR – the cost to service all medical equipment divided by asset cost

How has IT affected HTM?

- Off the shelf computers and OS on medical equipment
- Networked medical equipment
- Requires new skills for our staff
- Requires new ways to support equipment

New Practices in HTM with IT

- You can't just replace a bedside monitor in the ICU with a replacement without contacting the EMR team with new IP address

- You can't replace network switches without them being configured

- You can't just buy new medical equipment and place it on the network without involving IT

New Major Vendors in Health IT

BIG TECH IN HEALTHCARE

	Alphabet	amazon	Apple	Microsoft
Strengths	• Google Cloud • Verily Life Sciences • AI data analytics	• Amazon Web Services • HIPAA-eligible voice assistant • Amazon Care • PillPack	• Apple Watch • Research functions • Apple Health Records • iPhone consumer base	• Azure • Microsoft Genomics • Health Bot
Weaknesses	• Initiatives fragmented across divisions	• Many projects still in nascence	• Mixed clinical effectiveness of Apple Watch • Limited to iOS	• Lack of consumer-facing services
Opportunities	• Remote patient monitoring or research via Fitbit • EHR market disruption • Precision medicine	• Health insurance disruption • Broad-scale telehealth service • Medical supplies delivery	• Remote patient monitoring • Health system partnerships • Healthcare payments	• Precision medicine • Population health • Clinical decision support • Chatbot market dominance
Threats	• Consumer trust • Data security • Competition in the wearables space • Cloud competition	• Consumer trust • Data security • Cloud competition • Healthcare voice tech market competition	• Consumer trust • Data security • Competition from low-cost wearables	• Consumer trust • Data security • Cloud competition

INSIDER INTELLIGENCE

Source: Company filings

The Big Four tech companies are accelerating their pursuit of the healthcare market.
Insider Intelligence

Why are these companies getting involved in healthcare?

https://www.businessinsider.com/big-tech-in-healthcare-report

New sources for healthcare for consumers

Former Apple CEO: Walmart's health-care services will cause 'a consumer revolution'

WORK

Published Wed, Feb 26 2020·2:05 PM EST • Updated 5 Hours Ago

February 25, 2020, 4:00 AM CST

Checkup for $30, Teeth Cleaning $25: Walmart Gets Into Health Care

● The retail giant wants to grab a share of the $3.6 trillion in health spending by leveraging its 150 million weekly shoppers.

By Matthew Boyle

Walmart's Low-Price Clinics

X-rays and blood tests are also an option

0:17 / 0:36

Walmart's Low-Price Clinics

Baylor Scott & White opening clinics in DFW Tom Thumb stores

AliveCor KardiaMobile Personal EKG

$79
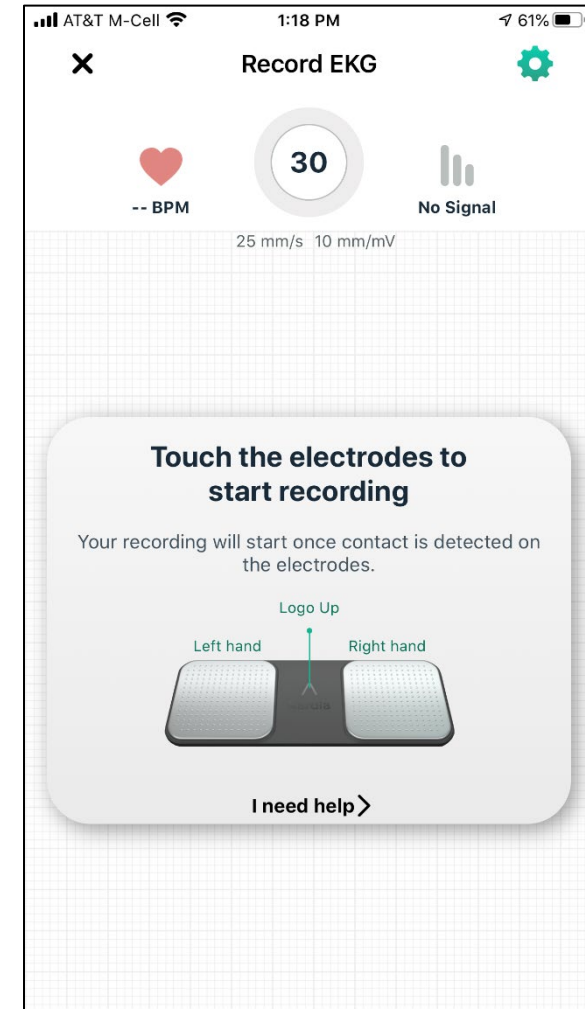
Here is the report you get back from AliveCor on your ECG

You can store it with AliveCor for $10 a month

Or you can just send it to your email in an **encrypted** PDF format

What lead is being recorded if I am using each finger to record?
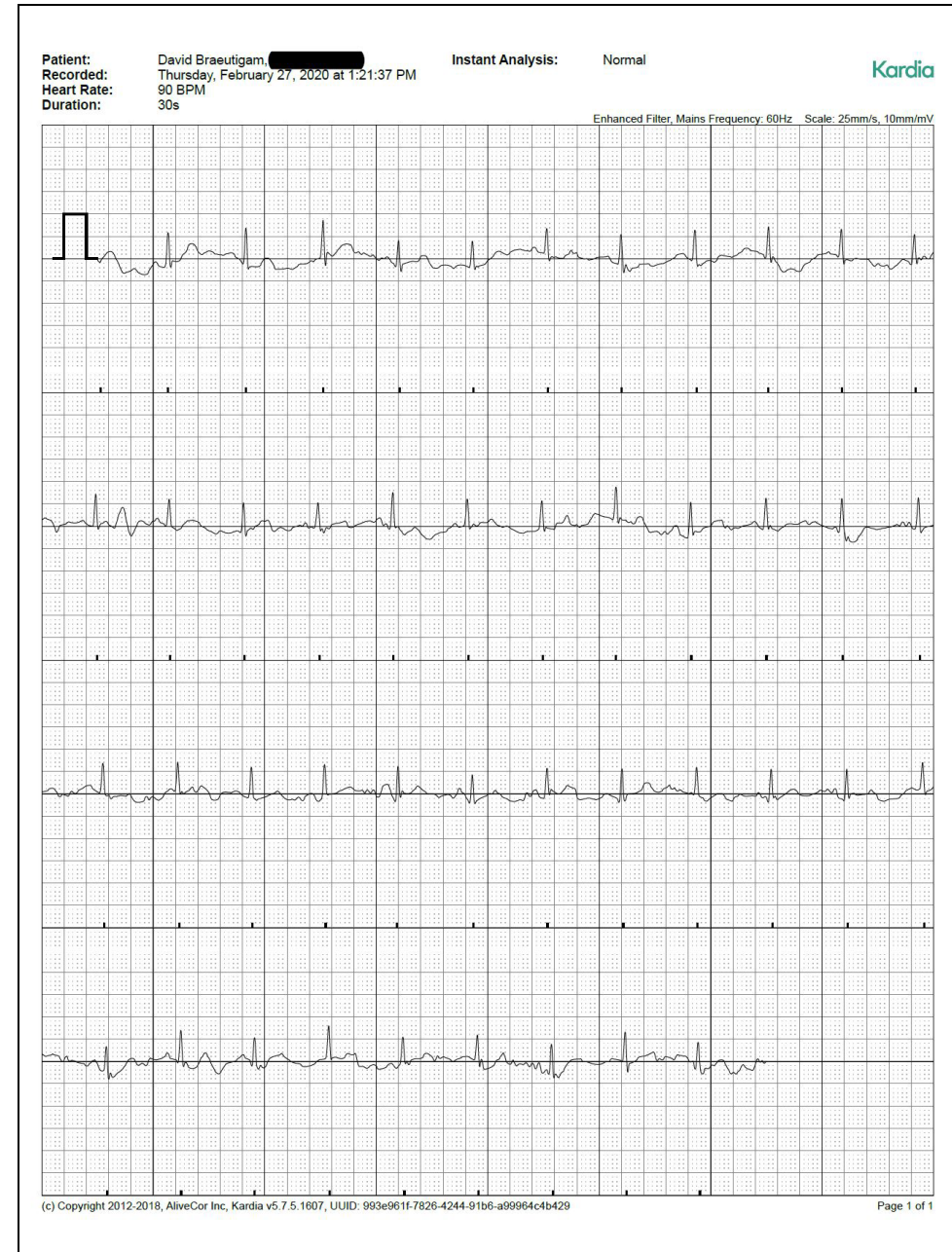
Apple Watch has FDA Approval

- Apple Watch 4, 5, 6, 7, and 8 can take an EKG and it has **fall detection**
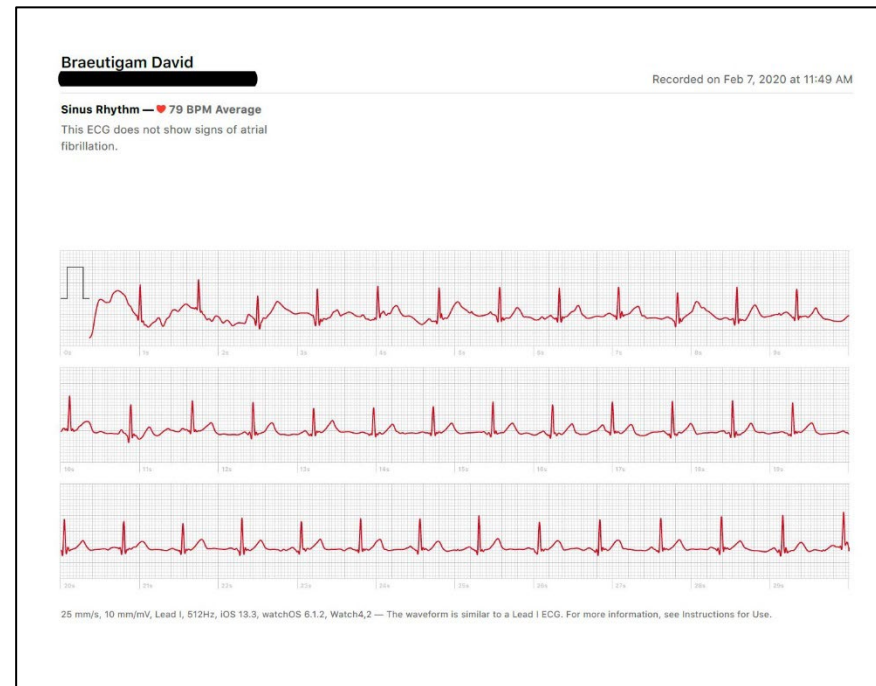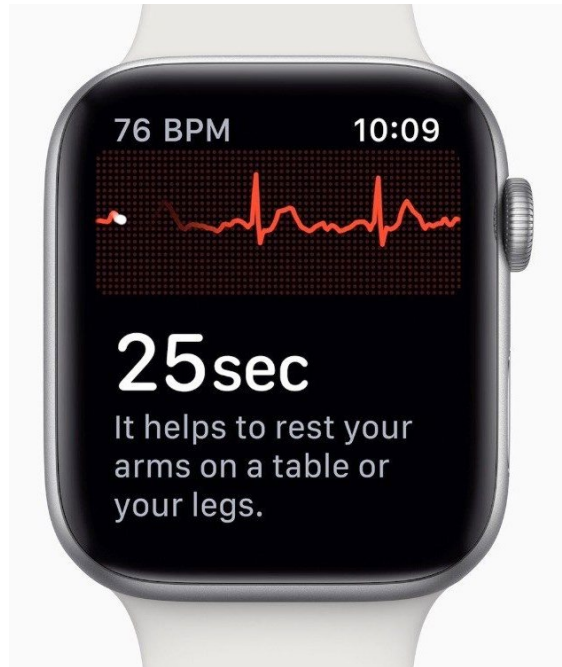
Apple Watch Fall Detection

- With fall detection enabled, if Apple Watch SE or Apple Watch Series 4 or later detects a hard fall, it can help connect you to emergency services and send a message to your emergency contacts. <mark>If Apple Watch detects a hard fall and that you have been immobile for about a minute, it will make a call to emergency services automatically.</mark>

- If you entered your age when you set up your Apple Watch or in the Health app and you're age 55 and over, this feature is turned on by default. However, anyone 18 years and older can also turn on fall detection on Apple Watch SE and Apple Watch Series 4.

Future of HTM

- I believe these ==new devices and new sources for healthcare== will greatly affect how we manage medical devices in the future
  - ECG from the home
  - NIBP from the home
  - Pulse Ox from the home
  - Glucose monitoring from the home
  - Doctor to patient over the web
  - Patients going to alternative sources for healthcare
- ==Is it IT or HTM that is going to manage these devices?==

Medical Equipment and IT

- The *majority* of medical equipment *purchased today* can and needs to reside on the network – wired or wireless
- That equipment is also tied back to a server or communicates to the cloud to share information
- HTM has a knowledge gap in IT education
- Since a lot of the *existing medical equipment can be 10+ years* old this creates a **Cybersecurity concern**

Partnering with IT

- IT manages the network and security*
- HTM should manage the medical equipment including
  - Cybersecurity
  - Patching
- HTM partners with IT and the OEM on
  - Mapping the layout of medical equipment network

*Some nontraditional IT components in the hospital (such as non enterprise desktops and serial to IP convertors) IT will not want to manage and will assign to HTM

Troubleshooting with IT

- IT **expects policies and procedures** on downtime, escalation and troubleshooting
  - How and when do you communicate downtime?
  - Who do you communicate to?
  - What is the expectation to get it back live?
  - How often do you communicate?

Example of Communication

- ICU patient monitoring is not communicating with the EMR
- Vendor has been called and should be onsite by 8 PM
- Start your EMR downtime procedures until notified
- Next communication will be at 9:00 PM
- Continue with communications until equipment is back live

This can be done via email, conference calls or both

Working with IT Security

- Used a Risk Assessment form designed by IT and approved by Risk Management to put medical equipment on the enterprise network

- Use the MDS2 form from the OEM to help complete the risk assessment form

- IT and Risk Management should routinely ask for reports on the status of medical devices on the network (non supported operating systems, etc.)

Risk Assessment example

MDS2 example

You Don't Have to be in IT

- You need to get to know the major players in IT regardless of where you report
  - Security
  - Applications
  - Project Management

Security

- What is allowed on the network?
- What version of OS are you running?
- What is the IP address?
- Who patches?
- When is patching done?
- What anti virus is allowed?
- Can default passwords be changed?
- **All information should be in CMMS and kept up to date**

Security

- What are you doing about <mark>thumb drive security</mark> when vendors come in?

- What are you doing about <mark>physical security</mark> such as cabling and locking down computers with PHI?

- What about unique accounts for each vendor employee that remotes in – and monitoring it?
  - What happens when an employee leaves a company but has access to your medical equipment network?
  - You already have a policy around this at work for employees why not for vendors?

Vendors have been known to infect computers from thumb drives

Medical equipment has been stolen that 'looks' like a laptop

Cybersecurity Resources

- AAMI Health IT Risk Management 2017
- AAMI Horizons 2014
- AAMI Medical Device Cybersecurity
- AAMI TIR57:2016 Principles for medical device security
- IEC 80001, ANSI/NIST HN 1-2019 (MDS2), NIST 800-53, ISO 27002:2022 – all security standards
- Search BI&T for Cybersecurity papers
- Subscribe to information on Cybersecurity
  - HealthITAnalytics.com
  - HITInfrastructure.com
- FDA.gov
  - https://www.fda.gov/medical-devices/digital-health-center-excellence/cybersecurity#:~:text=Medical%20devices%2C%20like%20other%20computer,cybersecurity%20risks%20is%20especially%20challenging.

https://www.aami.org/training/training-suites/regulatory/medical-device-cybersecurity-101-for-htm-professionals

Get to Know Your Cybersecurity Companies

- MORE and MORE Cybersecurity companies are offering their services as seen by the number of vendors at the AAMI eXchange and MDExpo conferences
- Can one of these help you?
- At what cost?
  - Approximately $25 per device per year for protection and monitoring
  - Many will auto populate your CMMS with up-to-date information (IP, OS, etc.)
  - Will also offer proactive monitoring (such as communicating with a server in Russia, etc.)
  - Some claim utilization reporting

Applications

- Who is key contact for each application?
  - EMR
  - PACS
  - GI Lab
  - Anesthesia
  - Lab
  - POC (Point of Care)
- Who handles application questions?
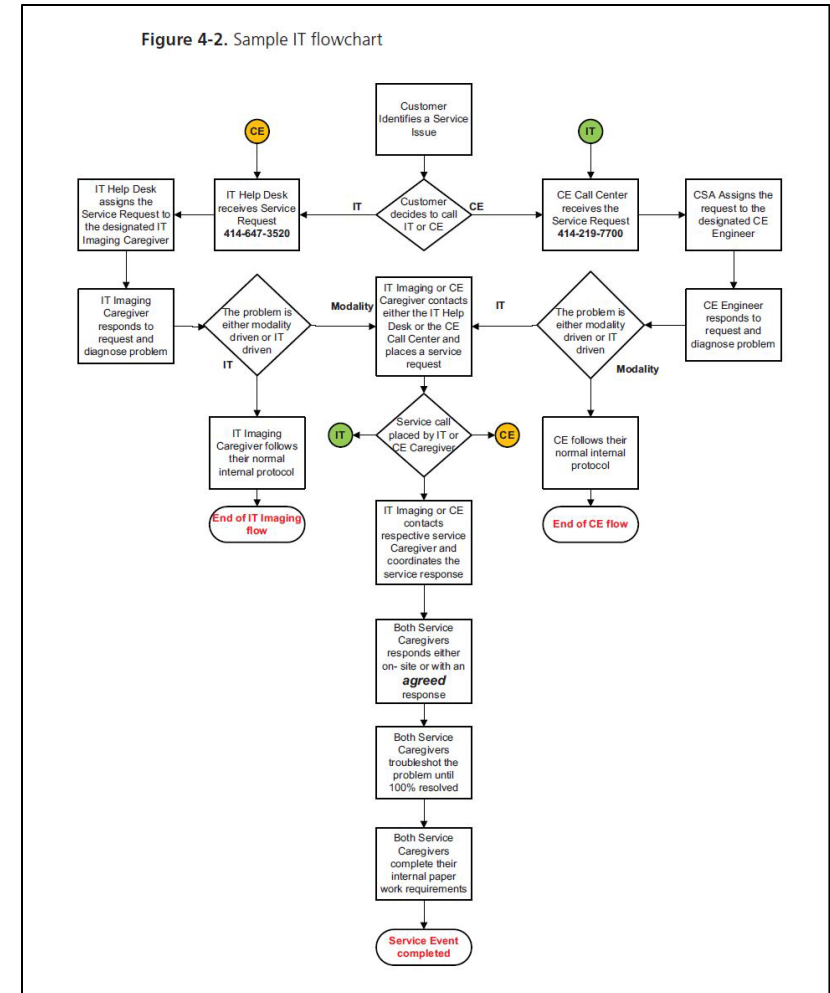
Sample IT Flowchart courtesy of HTTM Guide by Al Gresch and AAMI

Project Management

- Use the Project Management Office (PMO) to help with managing projects
  - They have the experience at managing projects
  - Any large project should have an internal or external Project Manager assigned
  - They DO NOT have to be Subject Matter Experts (SME) to manage the project – you are the SME

Concerns Over HTM Going to IT?

- Some are concerned that HTM is turning into IT

- I think it is just a natural progression of our field (who remembers vacuum tubes!)

- Your skills will always need to be updated in any field
  - IT went from mainframes to cloud-based servers
  - HTM from electronics to microprocessors to IT
  - Think of the auto mechanic today and what they dealt with 20 years ago

Major Modern Cars Security Risk

Third-Party Apps
Oversight
Key Fob Hacking
Personal Data
OBD-II Hacking
Vehicle-to-Infrastructure (V2I)
Vehicle-to-Vehicle (V2V)
Malware and Exploit
Spam and Advertising
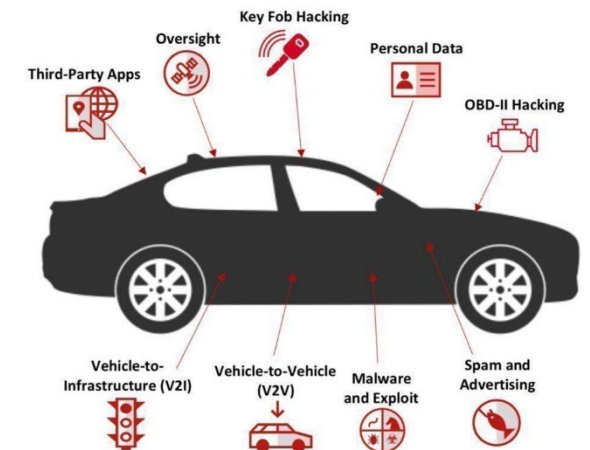
What Can We Learn from IT?

- IT is really good at policies and procedures
- IT is really good at managing downtimes
- IT is really good at getting dollars for projects
- IT is really good at being proactive to issues

- Shouldn't HTM look to IT for guidance in these issues?

CyberMDX
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32m · 🌐

Did you know that 55% of medical imaging devices run deprecated or otherwise unpatched versions of Windows ostensibly vulnerable to BlueKeep or DejaBlue?!

21.28% Continuously
31.91% Never
6.38% Monthly
10.64% Quarterly
29.79% Yearly

HOW REGULARLY DOES YOUR ORGANIZATION **AUDIT ITS MEDICAL DEVICE DEPLOYMENTS** FOR KNOWN VULNERABILITIES?

A Compendium of Connected Healthcare Technology Facts & Figures

cybermdx.com

Questions - Comments

- Pick up my business card if you want the presentation or want to ask me questions

- Don't forget to visit my FUN website for funny stories and pictures of biomed

- I'm also working on three new books – *Tales of the Biomed Part Tres*, *Incredible Tales of the Biomed, and Tales of the IT Guy* – send those stories and pictures to me!

https://TalesOfTheBiomed.com