AAMI2016 Conference & Expo
June 3–6, Tampa, FL

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Impact of MDI on Device Assessment & Acquisition

Presented by: ***American College of Clinical Engineering***

June 4, 2016 | Tampa, FL

PART 2

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Topic 2:
Impact of MDI on Device Procurement

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Sub-Topic 1:
Changing Process Considerations

Rob Maliff, Director Applied Solutions, ECRI Institute
Steve Juett, Sr. AVP, CallisonRTKL
Tobey Clark, Director ITS & Adjunct Faculty, University of Vermont
Angela Mulinix, Biomedical Engineer, VHA

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Acquisition Programs in an MDI World

Presented by Rob Maliff

Director, Applied Solutions
ECRI Institute

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Evolution of the Connected Medical Device

PAST

Self contained device per bed space

PRESENT

Interoperable therapy/diagnosis system with data exchange to various information systems.

New Acquisition Concerns

- Hospital Merger Mania

UT Southwestern, Texas Health Resources form huge health care network

Facebook Twitter Email Comments Print

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New Acquisition Concerns

- ***Hospital Merger Mania***
- Multiple EMRs
- Multiple model “standards” and preferences
  - Five preferred physiological monitoring providers!
- Multiple service arrangements
  - If various arrangements are known beforehand!

New Acquisition Concerns

- ***Cybersecurity***

- What does a hospital ask for in an RFI/RFP?
- Using a Common Vulnerability Scoring System (CVSS)?
- How does the supplier disclose vulnerabilities?
- How do you guarantee access to vulnerability fixes?

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Features

In Contracts with Device Vendors, Mayo Clinic Emphasizes Security

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New Acquisition Concerns

- ***Capital Planning and Budgeting Woes***

- Acute Care versus Community/ACO Health

- Telemedicine/ telehealth/mHealth
- Wearable sensors
- BYOD and PCDs
- MDS2- Require It!

Personal Connected Health Alliance

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New Acquisition Concerns

- ***Next Up…..***
- Steve Juett - CallisonRTKL
- Tobey Clark – University of Vermont Medical Center
- Angie Mulinix – Minneapolis VA Health Care System

Thank You

Rob Maliff

Director, Applied Solutions

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AAMI Booth #

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Medical Equipment Connectivity Acquisition

Presented by Steve Juett, PE

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Introduction

- Clinical Engineer 35+ Years
- Consultant 15+ Years
- Complex Clinical Systems – Connected Medical Equipment (CME)
- Acquisition – Procurement Services
- Vendor and Client Neutral

Complex Clinical Systems

Acquisition Challenge

- Understanding the Task
  - Connecting the dots
  - Diverse Stakeholders
  - Making Connectivity Work
- Validating the Requirements
  - Confusing data and available information

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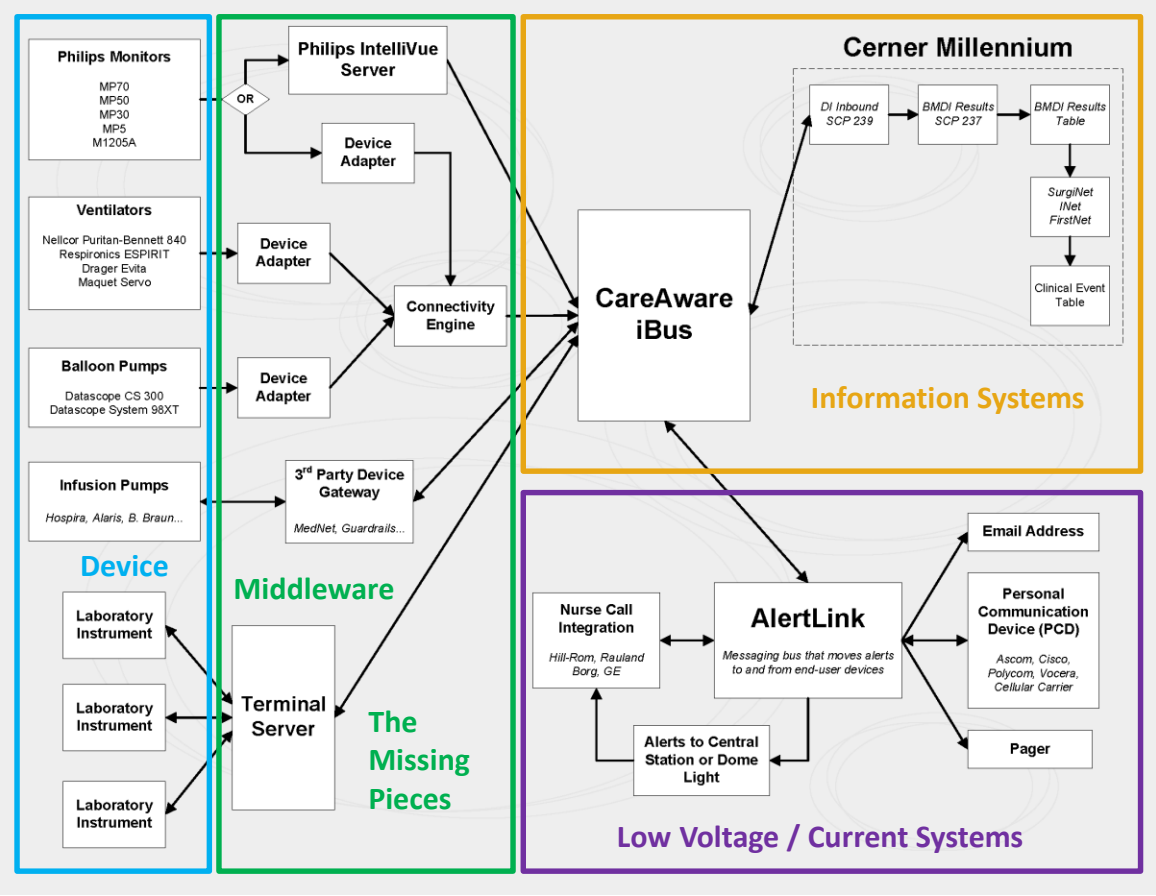
CME Project Example

- Understanding - What am I Procuring?



Complex Clinical Systems

Validating for Levels of Connectivity

- Device / Room
- Service Line
- Across Service Line
- Hospital Sharing
- Community of Health Information
- Proactive Lifestyle Monitoring

Confusing Data and Available Information

Managing the Procurement Detail

- Vendor RFI/ RFQ/ RFP
  - File Types – Mixed Content
  - Physical Connection
  - Proprietary Communication
  - Network
  - System

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Managing Complexity

- Process Brings Clarity
- Process Enables Informed Decisions
- Process Develops Priority
- Process Enables Success

Technology Connection Report

Atta ID CAD ID	Alt ID Item ID	Qty F/I AC	Description Model Item Notes	Manufacturer Vendor	Tech Connect Network System	Owner Use
Room: Electronics, Hybrid OR	**Room#: C-161B**		**Room Sign:**	**Area/Phase: Phase 1**		
Comments: OR18 Stryker router goes here						
5470-015 POW0030		1 O/V 2	Power Supply, Uninterruptible (UPS) Tripplite SMART1200XLHG Relocated all I-OR equipment to Electronics room C-163	Stryker Communications (0100-224-409) _____	D - Data PMN CMS	Available
7673-005 RTR0014	VIRO-01	1 O/V 2	Router, Surgical Suite Integration SwitchPoint Infinity 3 Included in I-OR system Router, Youch Panel Control Display, cables, hardware VIDEO ROUTER: DIMENSIONS 27.5" W x 29" D x 31 "H; POWER 120V/60Hz/4.75A HD CODEC: DIMENSIONS 5.1" W x 11" D x 13.9"H; POWER 120V/60Hz/3.3A WIRELESS MICROPHONE RECEIVER: DIMENSIONS 8.3" W x 7.2" D x l.93"H; POWER 120V/60Hz/l.5ACONDUIT RUN TO LIGHTING CONTROL BOX LOCATION	Stryker Communications ( ) Stryker Communications ( )	V - Video CVN I-OR	Confirmed
5655-015 SHL0585	C279585	1 O/C 1	Shelving, Wire, Wall, Double Super Erecta Post-Type Chrome 24W x 21D	InterMetro Industries Corporation ((2x)SW43C/(2x)2124NC) InterMetro Industries Corporation ( )	None	N/A

Managing Complexity

- Results – Budget Forecasting
- Results – Smooth Acquisition

Connected Medical Equipment

Clinical Integration Categories	Group	Number of Items		Cost					Priority	Data Source	Comments
		Project	Existing	Included	Gap	Existing	Programming	Project Total		HW/SW	
Source of Information		RTKL	IDS	RTKL	RTKL (HW)	ISD (HW)	ISD (SW)				HW = Hardware, SW = Software
Medical Equipment Care Aware	2.0	**558**	**12**		**$ 92,702.00**	**$ 1,350.00**	**$ -**	**$ 94,052.00**			
Anesthesia, Gases	2.1	16		X	$ -			$ -		RTKL / ISD	
BIS (interoperative EEG)	2.2	3		X	$ -			$ -		RTKL / ISD	
Lab Instruments	2.3	72	6		$ 64,377.00	$ 1,350.00		$ 65,727.00		RTKL / ISD	Ruth - Existing
Lab Terminal Server	2.4	72			$ 16,200.00			$ 16,200.00		RTKL / ISD	LanTronix UDS1100-POE single port
Philips Monitors (Gateway)	2.5	5		X	$ -			$ -		RTKL / ISD	Existing, Replaced by eq Vendor quote.
Pumps - Future Integration	2.6	299		X	$ -			$ -		RTKL / ISD	Existing Wireless and server, Only Software development.
Cerner Accessories (Cables, Adapter)	2.7	91	6		$ 12,125.00			$ 12,125.00		RTKL / ISD	
Alerts Care Aware	3.0	**116**	**0**		**$ 28,500.00**	**$ -**	**$ -**	**$ 28,500.00**			
DECT phones System	3.1	1		X	$ -			$0.00		RTKL / ISD	Budget: 275 handsets, 1 ea Unite 19, 1 ea IMS2, 1ea license Netpage, 500 license for page profiles ($239,000). Alert Programming (Hardware in DECT budget)
Philips Monitors (Connectivity Engine)	3.2	108		X	$ 13,500.00			$ 13,500.00		RTKL / ISD	Utilize a 2nd serial port; included in project cost
Nurse Call System (Responder V)	3.3	1			$ -			$ -		RTKL / ISD	Ascom Unite CFCI, Includes ADT HL7
Nurse Call Messaging Engine	3.4	1			$ -			$ -		RTKL / ISD	AlertLink, CFCI, Engine Includes ADT HL7
Cerner AlertLink	3.5	1			$ 15,000.00			$ 15,000.00		RTKL / ISD	Estimated differential to Unite messaging. Phys Monitor license thru Ascom Unite
Pager System (existing)	3.6	1		X	$ -	$ -		$ -		RTKL / ISD	Alert Programming (Hardware in Telecom budget)
Cerner Sublicense software - CareAware/alert link	3.7	1		X	$ -			$ 79,588.00		ISD / ISD	Cerner 1-2a9xtyt June 2, 2011
Professional services CareAware /Alert link	3.8	1		X	$ -			$ 61,250.00		ISD / ISD	Cerner 1-2a9xtyt June 2, 2011
First year fees CareAware for alert link	3.9	1		X	$ -			$ 47,616.00		ISD / ISD	Cerner 1-2a9xtyt June 2, 2011
Interfaces (HL7) Oracle Egate	4.00	**153**	**0**		**$ 3,825.00**	**$ -**	**$ 400,000.00**	**$ 403,825.00**			
Stryker Room Integration	4.01	9			$ 225.00		$ 25,000.00	$ 25,225.00		RTKL / ISD	
Cardiology Information System	4.02			X	$ -		$ 25,000.00	$ 25,000.00		RTKL / ISD	GE, Mortara or TraceMaster View
Paceart	4.03			X	$ -		$ 25,000.00	$ 25,000.00		ISD / ISD	
Cardiology PACS	4.04			X	$ -		$ 25,000.00	$ 25,000.00		ISD / ISD	
Radiology PACS (Fuji)	4.05			X	$ -		$ 25,000.00	$ 25,000.00		ISD / ISD	
Live Data	4.06	7			$ 175.00		$ 25,000.00	$ 25,175.00		RTKL / ISD	Surginet vs. LiveData discussion
Transport Command Center	4.07			X	$ -		$ 25,000.00	$ 25,000.00		RTKL / ISD	ISIS Pro under consideration
Abbott Glucometer	4.08	3			$ 75.00		$ 25,000.00	$ 25,075.00		RTKL / ISD	Docking Station
Abbott I-Stat	4.09	5			$ 125.00		$ 25,000.00	$ 25,125.00		RTKL / ISD	Docking Station
Medicatioin and Supply Dispensing (Pyxis)	4.10	124			$ 3,100.00		$ 25,000.00	$ 28,100.00		RTKL / ISD	Leased items with connectivity costs
Tissue Tracker (Pyxis)	4.11			?	$ -		$ 25,000.00	$ 25,000.00		RTKL / ISD	EQ need follow up, possible User Change Order , Bar code, refrigerator
Nurse Call	4.12	1		X	$ 25.00		$ 25,000.00	$ 25,025.00		RTKL / ISD	
EndoWorks	4.13	1		X	$ 25.00		$ 25,000.00	$ 25,025.00	1	RTKL / ISD	
Impress-Holter	4.14			?	$ -		$ 25,000.00	$ 25,000.00		RTKL / ISD	Unknown
Heart-Lung Bypass (Anesthesia IS)	4.15	3		X	$ 75.00		$ 25,000.00	$ 25,075.00		ISD / ISD	Perfusion system

Complex Clinical Systems

Summary

- CME Acquisition is COMPLEX!
  - Many Diverse Stakeholders
  - Attention to:
    - Technical Connection detail
    - Interfaces and software – Device and IT
  - Big Budget impacts

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Thank You

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Medical Device Integration: *Acquisition*

Focus on Request for Information and Replacement Planning

Tobey Clark, CCE FACCE
Technical Services Partnership
University of Vermont

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AAMI: Top Ten Medical Device Challenges

#1 - Managing devices on the network

#2 - Integrating data into the EHR

#4 - Cybersecurity

#7 - Wireless spectrum

ECRI: Top Ten Patient Safety Concerns

#1 - Health IT Configurations/and Organizational Workflow That Do Not Support Each Other

ACQUISITION MUST ADDRESS THE ISSUES!

Medical Device Integration:
University of Vermont Medical Center

- Organization wide Philips Bedside monitors, central stations, telemetry access points, telemetry transmitters and associated components.
- Organization wide imaging systems.
- Organization wide B-D Alaris large volume infusion pumps.
- Organization wide endoscope cleaners
- Masimo pulse oximeters on Medical/surgical floors.
- Invasive Cardiology Cathlab, Evoked Potential diagnostic systems, and Pacemaker programmer systems.
- Non Invasive Cardiology EKG carts, Holter and stress test systems.
- Anesthesia Machines.
- Radiation Oncology planning and treatment systems.
- Dialysis Machines.
- Neurology EEG and Sleeplab systems
- Pulmonary function systems.
- Respiratory Ventilators.

Also unidentified equipment in the Clinical Laboratory

Critical Acquisition Step: *Request for Information*

- Technical Standards Questionnaire
  - Purpose of this Document
  - Intended Audience
  - Introduction and Instructions
- Basic Information
  - Name of Organization/Company
  - Name of System
  - Functional Overview of System
  - Technical Overview of System
- Detailed System Information
  - Infrastructure
    - Servers
    - Disk Storage
    - Network
    - -Why does it need to be conn...
    - Desktop Client
    - Devices (printers, scanners, m...
    - Telecommunication
  - Does the system communicate w...
  - Software
    - Architecture
    - Components
    - Web Environment
  - Database
    - Architecture
    - Management System
    - Size and Configuration
    - Backup and Recovery
    - Updates and Patches
    - Schema
  - Security
    - Architecture
    - HIPAA Compliance
    - PCI Compliance
    - Data Security
    - User Authentication and Acco...
    - Application Administration an...
    - Auditing
  - Interoperability
    - Data Transfer
    - Interfaces
  - Cloud and Hybrid System
    - Infrastructure
    - Policy
  - System Maintenance
    - Support
  - Can you provide manuals on phy...
  - Reliability and Performance
    - Availability
    - Fault Tolerance
    - Performance
  - Backup and Recovery
    - System Backups
    - Disaster Recovery
  - Future Direction
    - New Version
    - Product Development

RFI Detail: *Networking Questions*

1. Describe the connection method between end users and supporting infrastructure; include required bandwidth and a network diagram.

2. Does the system require greater than 100 Mbps network bandwidth to the client or 1Gbps network bandwidth to the server? If so, please explain the requirements.

3. Are any network protocols other than TCP/IP required?

4.Do you use IPv6? If so, do you support dual-stack mode with IPv4?

5. Is an isolated network segment required for any servers or workstations associated with this system?

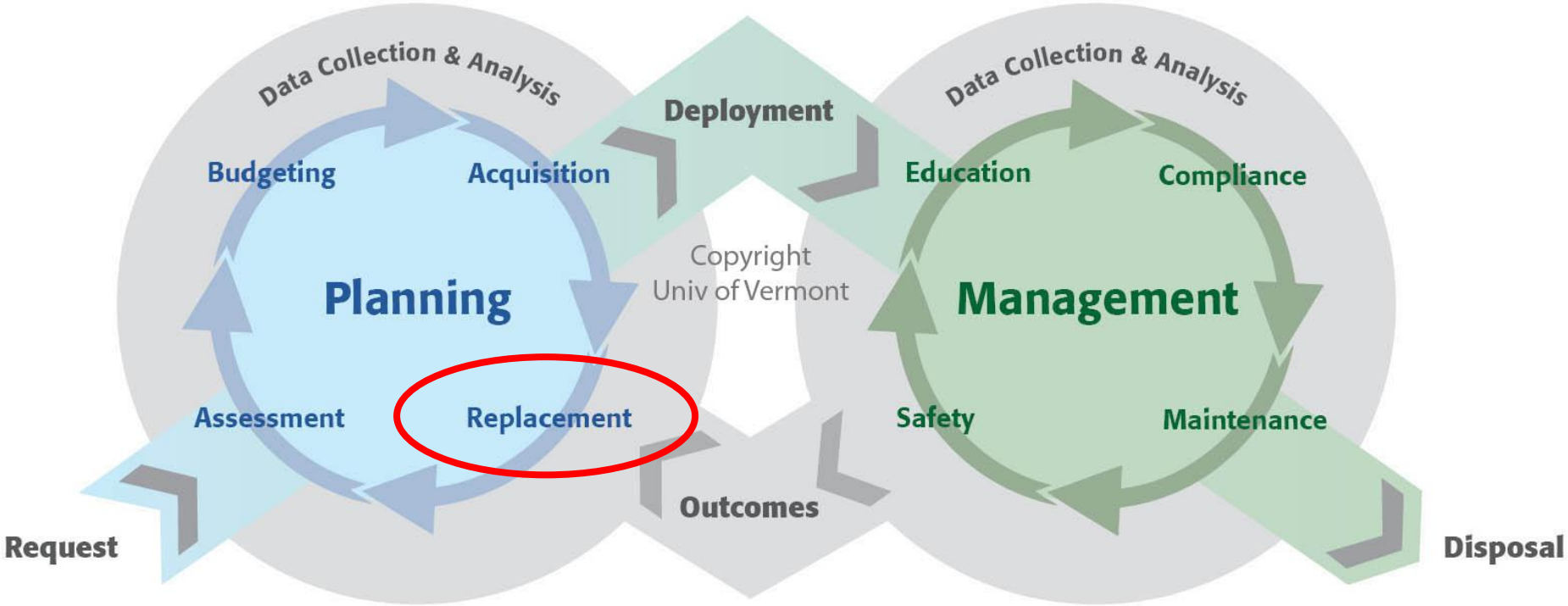
6. Does your system support load balancing? Do you have a preferred vendor?

7. Are there any requirements for wireless network connectivity for servers, workstations, or mobile devices associated with this system? If so, please describe.

8. If you require/support wireless connectivity, what forms of wireless security do you support (WPA/WPA2/WPA Enterprise, 802.11x)?

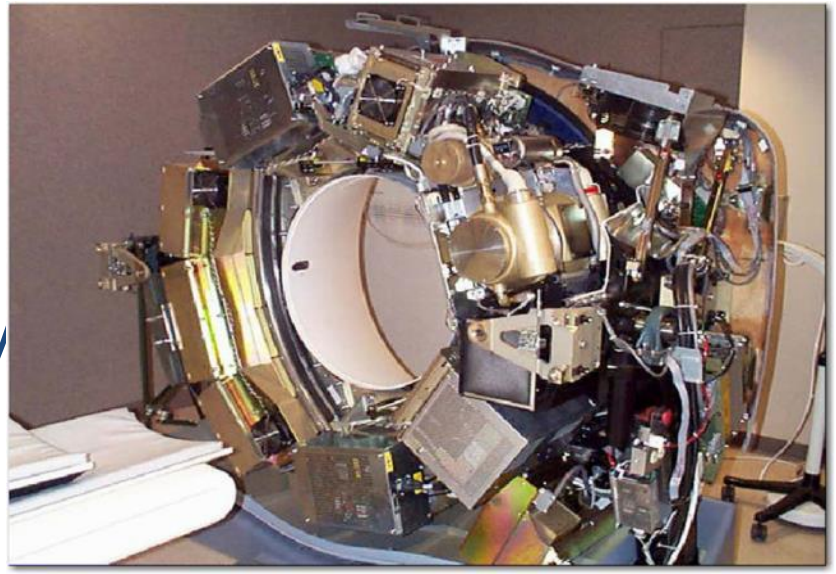
9. What wireless protocols do you support (802.11a/b/g/n/ac)?

Health Care Technology Life Cycle



Technology Replacement

- ***Quantitative Method***
- Analyze technology database for:
  - Obsolescence
    - Technological
    - Clinical
  - Cost-effectiveness
  - Safety and Reliability
  - Support
  - Condition
  - MDI capability



Equipment Database: *Network Integration*

- Will the device data go to the electronic health record?
  - 30+% of medical devices?[1]
  - Legacy devices must be replaced or upgraded
  - I/O port
    - Analog or no output
    - Digital output translatable by middleware to EHR
    - HL7 output

[1] Kaiser Permanente

Technology Replacement – When?

- When it fails at a critical time?
- When the physician returns from a conference and states the current technology is obsolete?
- When the department manager complains ***"my equipment never works right"*** at the capital budget meeting?
- When undergoing repair, it is found that parts and support are no longer available?
- *When you try to interface the device with the network and find that it will need to be replaced?*

NOT! Need a plan for technology replacement!

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Medical Technology Acquisition:
Emerging Process Considerations

Presented by Angela Mulinix, MS, CCE
Department of Veterans Affairs

VA HEALTH CARE | Defining EXCELLENCE in the 21st Century

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Areas to consider during *Acquisition*

Cyber security

Strategic sourcing

Data analytics

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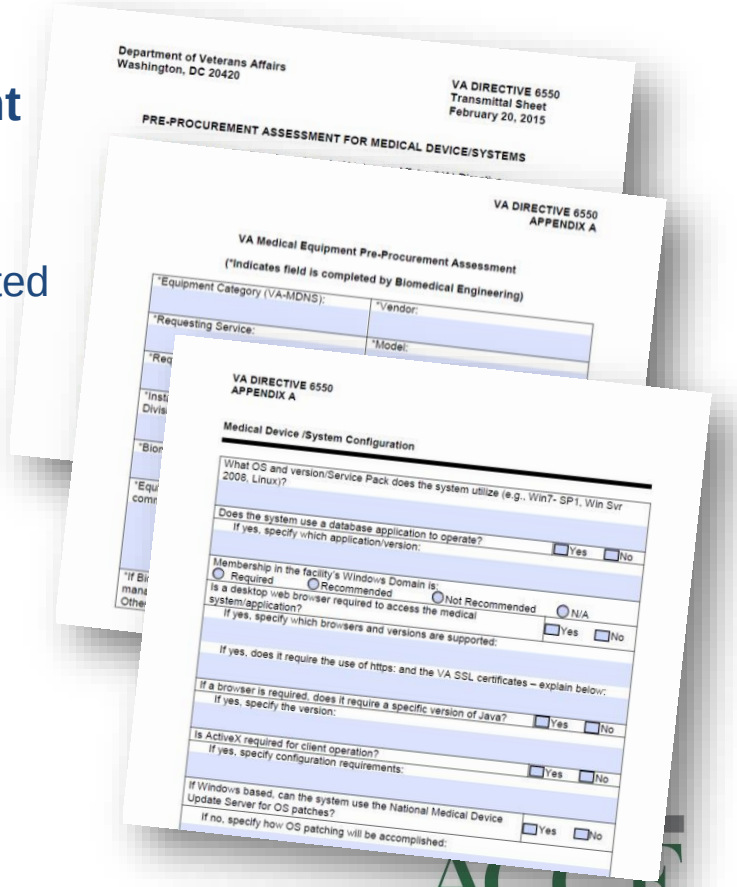
Cyber Security

MDPP
Medical Device Protection Program

- VA-wide initiative to provide a safe and secure operating environment for networked medical devices that provide direct care to our nation's Veterans.

- **Directive 6550 - Pre-procurement Assessment**
  - Conducted prior to acquisition of medical devices/systems
    - Medical devices/systems that will be connected to networks
    - Medical devices that store sensitive patient information
  - Multi-disciplinary technical review
    - Biomedical Engineering, Information Technology, Information Security, Privacy Officer, and Contracting
  - Ensure compliance with TJC requirements



Department of Veterans Affairs
Washington, DC 20420

VA DIRECTIVE 6550
Transmittal Sheet
February 20, 2015

PRE-PROCUREMENT ASSESSMENT FOR MEDICAL DEVICE/SYSTEMS

VA DIRECTIVE 6550
APPENDIX A

VA Medical Equipment Pre-Procurement Assessment

(*Indicates field is completed by Biomedical Engineering)

*Equipment Category (VA-MDNS):
*Vendor:
*Requesting Service:
*Model:

VA DIRECTIVE 6550
APPENDIX A

Medical Device /System Configuration

What OS and version/Service Pack does the system utilize (e.g., Win7- SP1, Win Svr 2008, Linux)?

Does the system use a database application to operate? ☐Yes ☐No
If yes, specify which application/version:

Membership in the facility's Windows Domain is:
◯ Required ◯ Recommended ◯ Not Recommended ◯ N/A

Is a desktop web browser required to access the medical system/application? ☐Yes ☐No
If yes, specify which browsers and versions are supported:

If yes, does it require the use of https: and the VA SSL certificates – explain below:

If a browser is required, does it require a specific version of Java? ☐Yes ☐No
If yes, specify the version:

Is ActiveX required for client operation? ☐Yes ☐No
If yes, specify configuration requirements:

If Windows based, can the system use the National Medical Device Update Server for OS patches? ☐Yes ☐No
If no, specify how OS patching will be accomplished:

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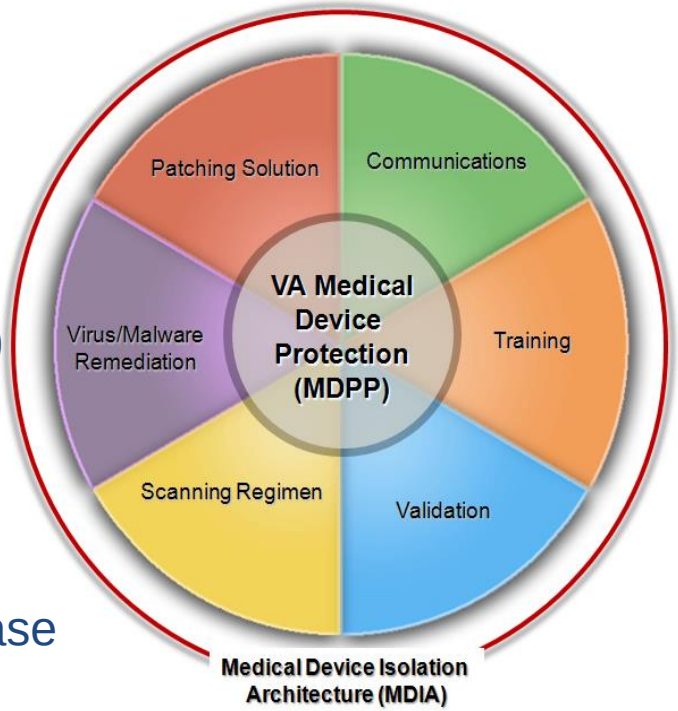
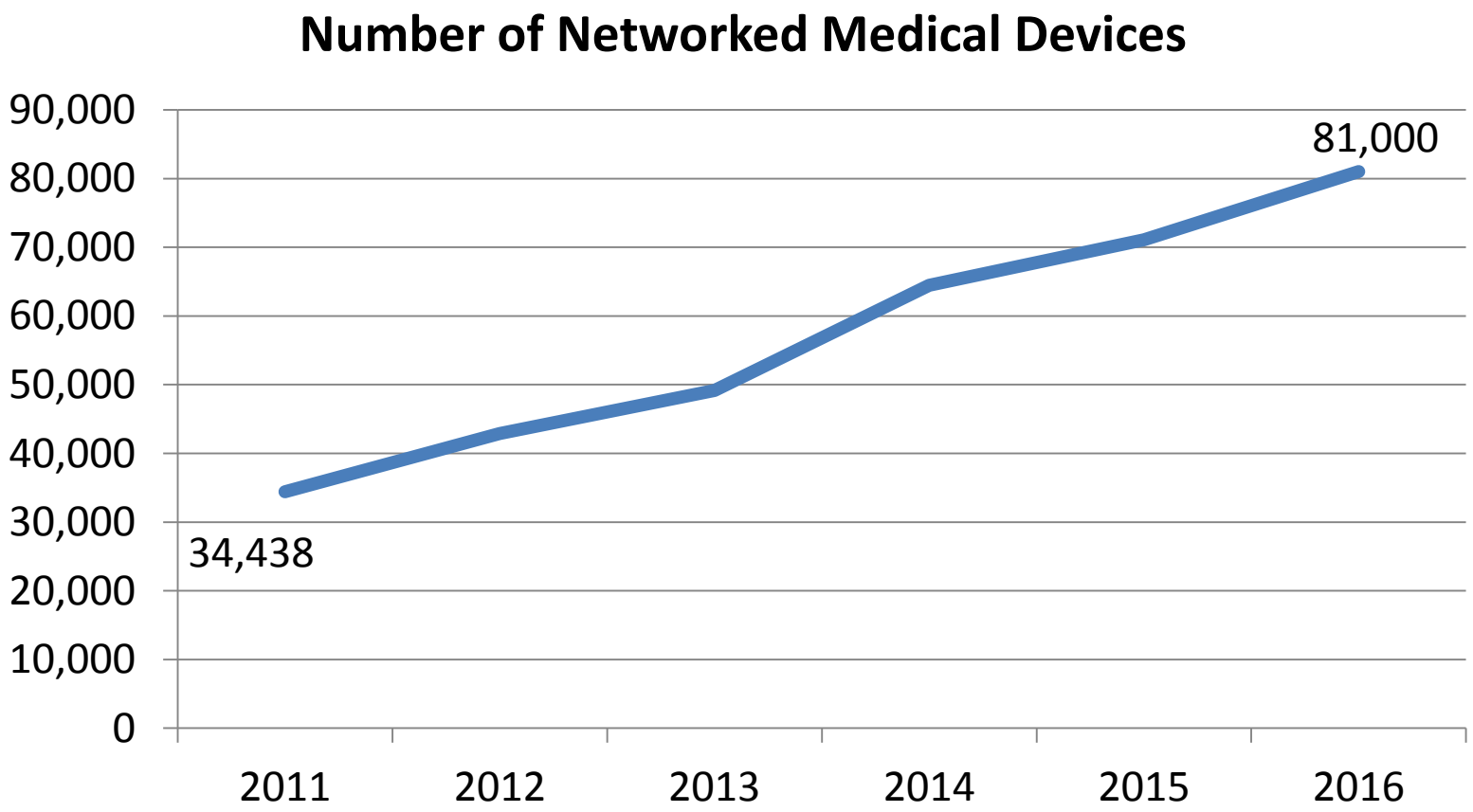
Cyber Security

- **Risk Analysis Process**
- **Medical Device Isolation Architecture (MDIA)**
- **Incident Reporting & Remediation**
- **Ongoing Medical Device Protection**
  - NMDD - Networked Medical Device Database
  - WSUS - Windows service update system
  - Antivirus
  - Mobile media scanning
  - Patching policy
- **End of life decommissioning**

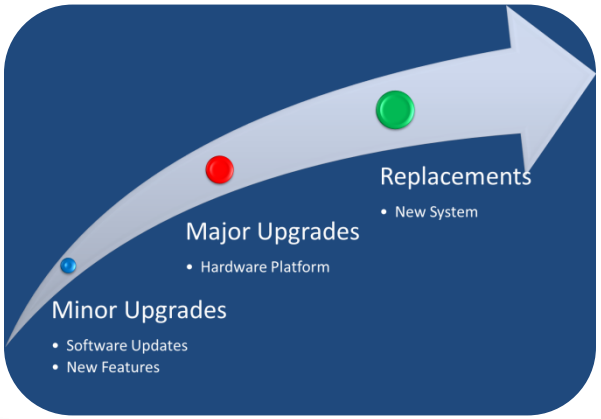


Interoperability



Strategic sourcing

- Making plans, projections, and decisions based upon the life cycle of equipment



Method the VA uses:

- **Step 1:** Analyze current equipment
- **Step 2:** Develop equipment specific lifecycle models
- **Step 3:** Apply lifecycle model to equipment type
- **Step 4:** Align equipment acquisition schedules across VISN
- **Step 5:** Adjust schedule to effectively and practically distribute costs over time and two phase implementation

Data Analytics

- Use data from maintenance histories
  - Assess reliability
  - Safety
  - Use issues
  - Applications training

VA Midwest Health Care Network

Imaging Service Line

Biomedical Engineering

VISN 23 Digital Radiography (DR) Initiative

VISN-wide Evaluation, Implementation, and Optimization of State-of-the-Art Radiographic Imaging Technology

Project AIM

Upgrade conventional radiographic equipment to digital radiographic at all facilities across VISN 23.

Install Equipment

Design & Construct Site Prep

– Project Management – Weekly Conference Calls

Establish Implementation Timeline

Commission Implementation Team

Implementation Team
Radiology
Biomedical Engineering
Construction Engineers
Vendor Partner

– Evaluate Proposals – Clinical Function, Technical Specs, Price, Value – Order Equipment –

Competitive – Procurement – Issue RFP, Obtain Vendor Proposals

Define Clinical and Technical Requirements

– Market Research – Product Demonstrations, Site Visits, RSNA Conference

Commission Multidisciplinary Technology Assessment Team

Initiative Conceived at ISL Meeting

Continuous Improvement

Clinical Applications Training

– Consultant – Optimize Images Physics Training

Continuous Protocol Refinement

Biomedical Expert Group

Establish Maintenance Program

Corrective and Scheduled Maintenance

ACT → PLAN → DO → STUDY → ACT

Results

- 23 Systems Implemented within 2 years
- Standardized Technology Across VISN
- Acquisition Cost Savings over $3.0 Million
- Consistent Image Production & Standardized Processing Algorithms across all Facilities
- Customized Applications & Physics Training
- **50% Reduction of Radiation Dose to Patients**
- **Increased Patient Throughput x2**
- **Images to Radiologist Almost Instantly**
- **High Level of Staff Satisfaction**
- Collaborative Problem Resolution
- Consistent Integration to PACS
- Maintenance Efficiencies

What is DR?

- Digital radiography systems replace the film and cassette used in conventional radiography systems with a digital flat detector.
- The film-less system provides sharper images of patient anatomy – very quickly to radiologist s.

"DR modernized our department. We get through our workload faster; our technical staff has sharpened their skills. There are numerous clinical improvements, such as my ability to resolve bone." -Dr. Orton
Chief of Radiology, NW Healthcare System

"DR enhances the Veterans' experience by rapidly producing excellent images at lower doses of radiation." -Jane Keel
Radiology Supervisor, VAMC Minneapolis

Capital Investment
$10.2 Million
Equipment Cost: $8.5M
Construction Cost: $1.5 M
Consultant/Other: $200k

VISN 23 Biomedical Engineering

Thank You

I would like to publicly acknowledge the following contributors to this presentation:

Kurt Finke
Megan Friel
Jim Witting
Jennifer Gersten

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Sub-Topic 2:
Integrated Systems Support Considerations

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Roberto Torres, Jr., CE Manager, Cedars-Sinai Medical Center
Samantha Jacques, Director CE, Penn State Milton S. Hershey Medical Center

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Integrated Support for Systems

L. Michael Fraai, MS, CCE

Executive Director Biomedical Engineering and Device Integration

BRIGHAM AND WOMEN'S HOSPITAL

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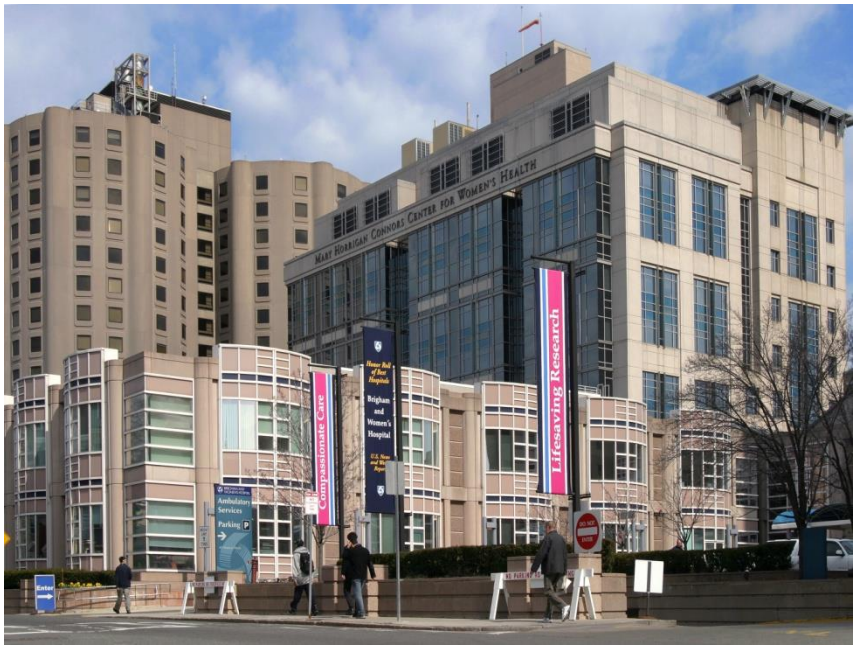
Brigham and Women's Hospital



- 793 Licensed beds
- 146 ICU beds
- Patient care network ~ 1600 devices
- 489 Telemetry beds
- 43 Operating rooms
- BMDI integrated into EHR system

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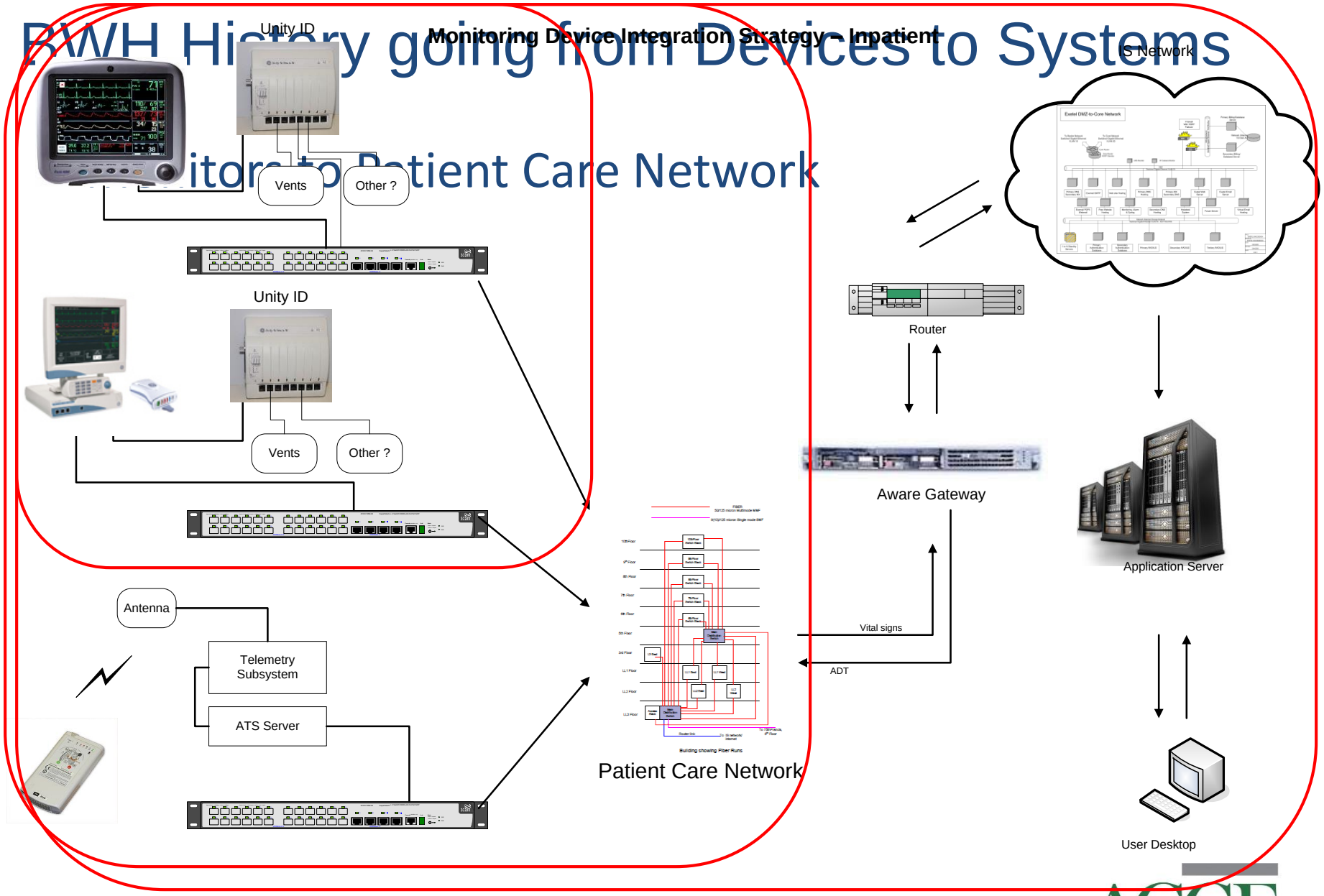
BWH History going from Devices to Systems

itors to Patient Care Network



BWH History going from Devices to Systems

- ECG machines to ECG archival system
  - Results and Billing interfaces, now orders
- Fetal Monitor strip archival system
- Integrated video systems
- IV delivery platforms
  - Wireless connectivity

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Providing Support for Clinical Systems

- Seamless for clinicians
- Multi-disciplinary teams
  - IS & Application teams
  - Multiple vendors
- Clinical competency
  - Workflow understanding
- Technical Competency
  - Knowledge and understanding
    - Device function
      - Parameters & how it works
    - Device output
      - Network, analog output
- Device Redundancy
- Troubleshooting across the BME domain

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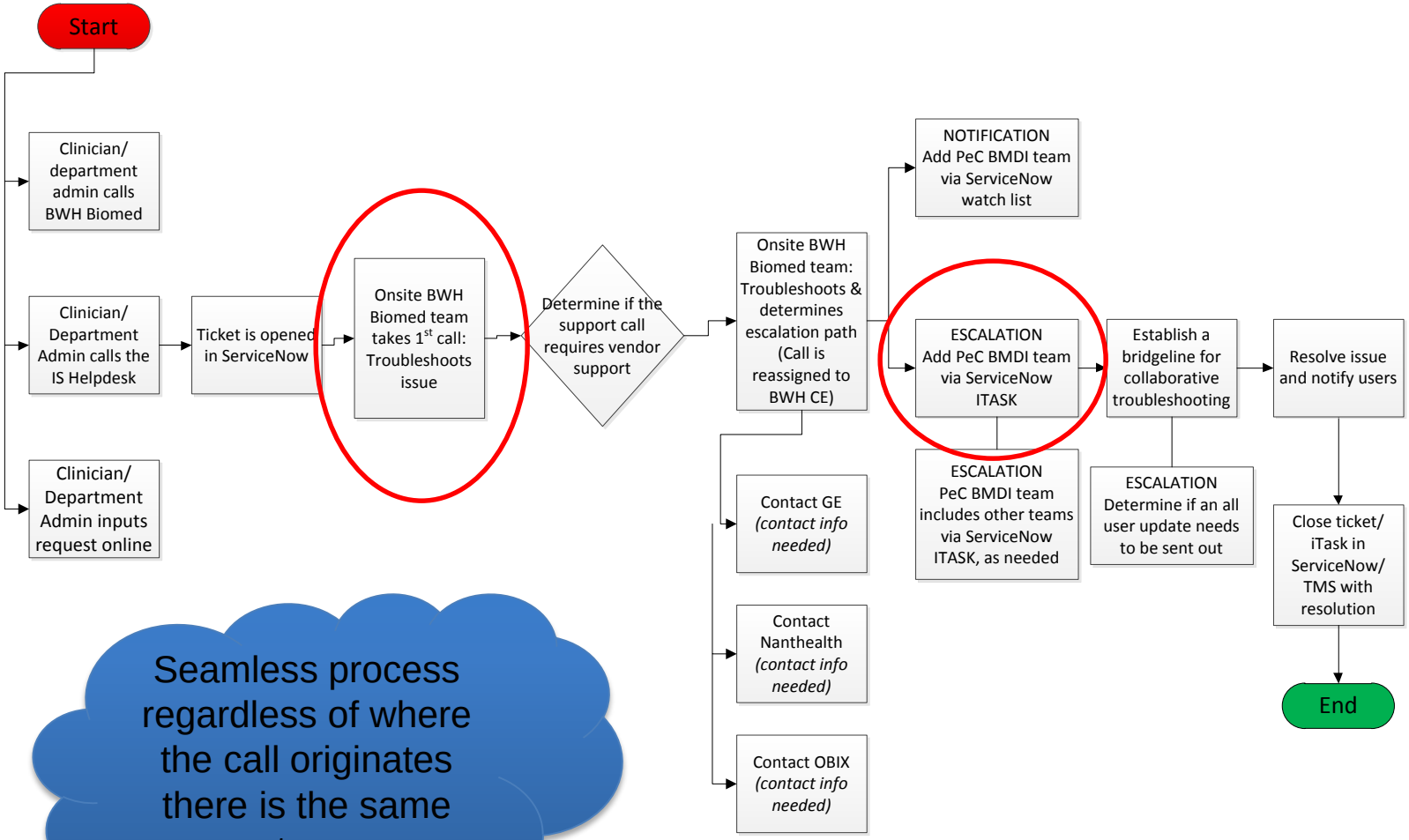
Integrated Workflow Support



Seamless process regardless of where the call originates there is the same outcome

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How do you develop the skills?

- Device competency
  - Technical training on the device
- Device output
  - What is the output?
  - How does the device interface?
    - Network, Analog output
- Network fundamentals
- Integrated network
- Use of data flow
  - Help understanding
  - Troubleshooting tool

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BWH Example

- Technical Training
  - Network basics
  - Data flow schematics
- Scenario based training
  - Use a clinical call to learn the skills to troubleshoot

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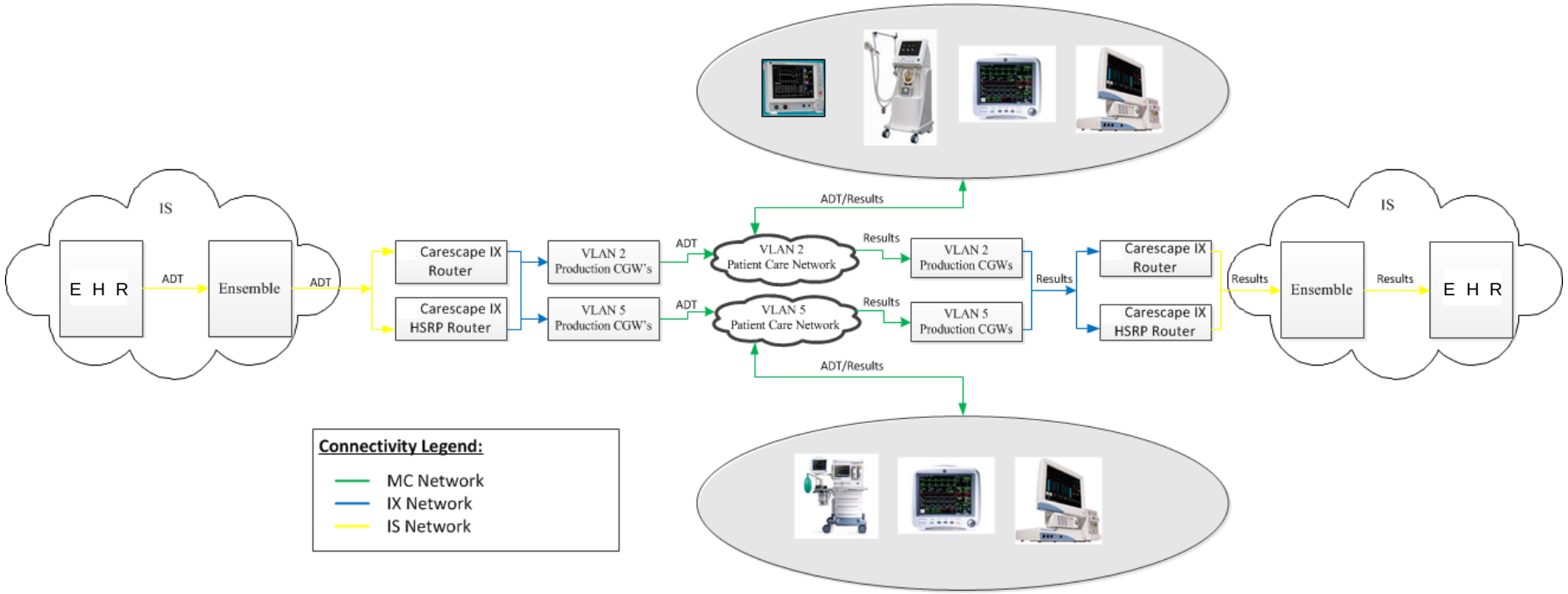
Systems Data Flow



Example of a scenario

- Telemetry Scenario #2: Nursing staff call helpdesk due to tele patient data not populating in the patients flowsheet. Information on ticket states “Patient returned from being off-unit and telemetry data is no longer showing in their flowsheet”.
- Biomed Checkpoint: Demonstrate ability to check patient admit location in EHR. Once conflict identified (patient moved in EHR, but left admitted to old location in tele) move patient @ CIC and show data transfer over. Verify data showing in patients chart before leaving
- Follow-up Questions with Scenario: Did staff move patient @ central or discharge/re-admit. Make sure staff knows different approaches and implications with respect to data @ CIC/bedside monitor.
- Once patient moved, staff asks about pulling demographics to monitor/CIC. Also ask about data for last 10 minutes that was going into wrong patients chart.
  - Biomed Checkpoint: Demonstrate knowledge/ability of pulling ADT to the CIC.
  - Biomed Checkpoint: Identify data flowchart fix as non-biomed . Direct user to EHR analyst team (verify correct team this type of issue should go to).

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Challenges

- Sustain knowledge of systems
  - As calls ↓
  - In addition to the other Biomed expectations
- Resources to develop, maintain, implement and track a training syllabus
- Staff turn over

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Take Away

Teach me and I shall forget

Show me and I shall remember

Let me do it and I shall understand

~ Adapted from Benjamin Franklin

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Thank You

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A Collaborative Approach to Supporting Integrated Devices

Presented by:
Roberto Torres, Jr.
Manager, OR Clinical Engineering
Cedars-Sinai Medical Center

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Cedars-Sinai Medical Center

- Established in 1902 and located in Los Angeles, CA.
- 886 licensed beds, Level I Trauma Center
- Expanding scientific and medical knowledge through research that benefits patients
- Educating healthcare professionals for the future
- Improving the health status of the community
- HIMSS Analytics Stage 7 facility
- Primary service area includes 3.3 million people

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Clinical Engineering & Device Integration (CEDI) Mission Statement

In close collaboration with clinicians, administrators, and other technology groups, Clinical Engineering and Device Integration (CEDI) promotes quality patient care through the appropriate and safe use of medical device technology.

Clinical Engineering and Anesthesiologists meeting to discuss the hardware mounting related to CS-Link Anesthesia Record implementation.

We strive to be a center of excellence for innovative and robust solutions that promote leadership in delivering healthcare related services.

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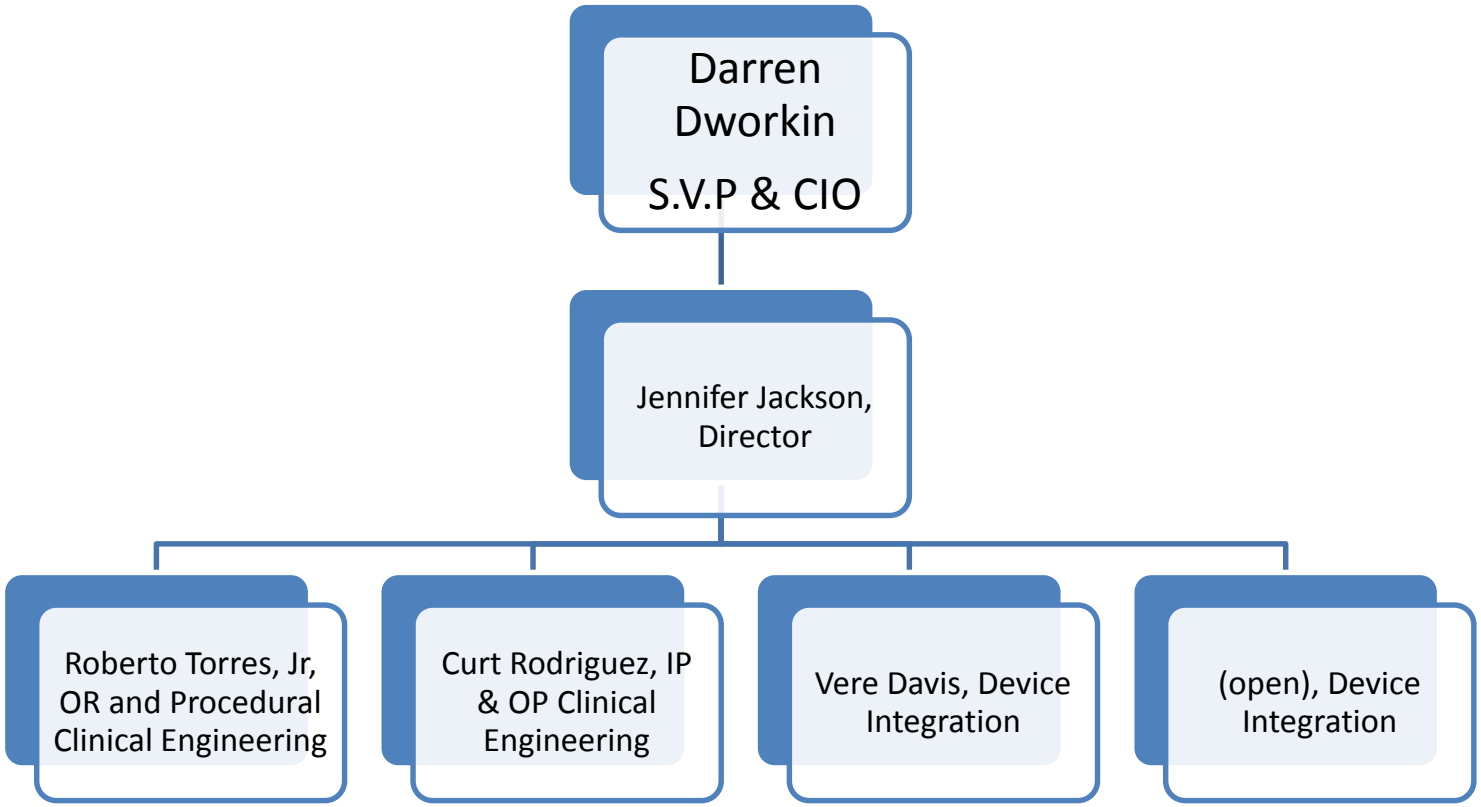
Clinical Engineering & Device Integration (CEDI) Mission Statement



Cedars Sinai
Not All Our Heroes Practice Medicine

From the HIMSS Analytics Press Release:
"Cedars-Sinai is one of the most fully deployed and automated facilities we have encountered in the HIMSS Analytics Stage 7 program. With all of their progress on device integration, including fully integrated smart pumps, Cedars-Sinai has approached a new level of patient safety, even among stage 7 facilities."
-John Hoyt, executive vice president of HIMSS Analytics

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Agenda

- Review a case study in supporting an integrated device system - Anesthesia Record in the OR's
- The Challenge
- The Approach
- The Outcome

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The challenge

- Deploy Anesthesia Record
  - Add a workstation, keyboard and mouse to an already crowded anesthesia device system. Total of 95 anesthesia machines.
  - Develop a cross-functional support solution.
  - Train anesthesiologists (approx. 180) and anesthesia techs (approx. 16)

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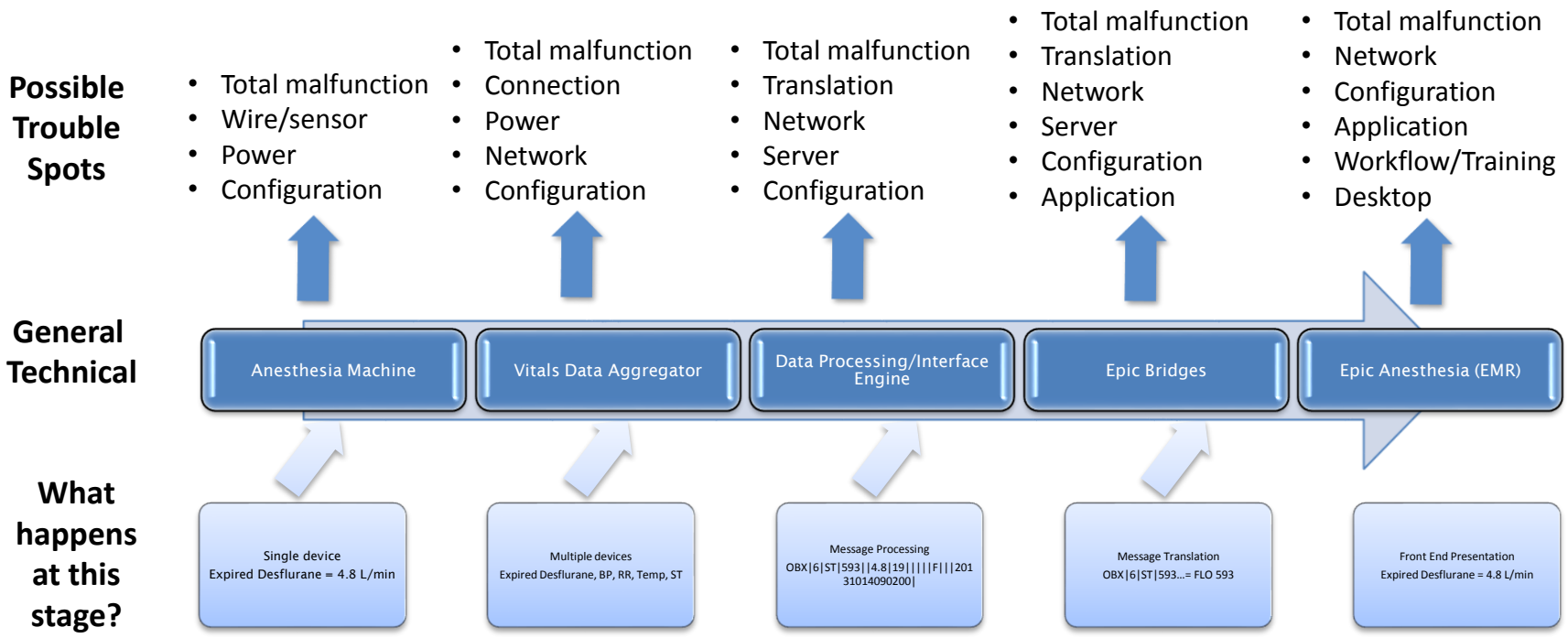
The Approach

Device integration overview – understanding the path of the data.

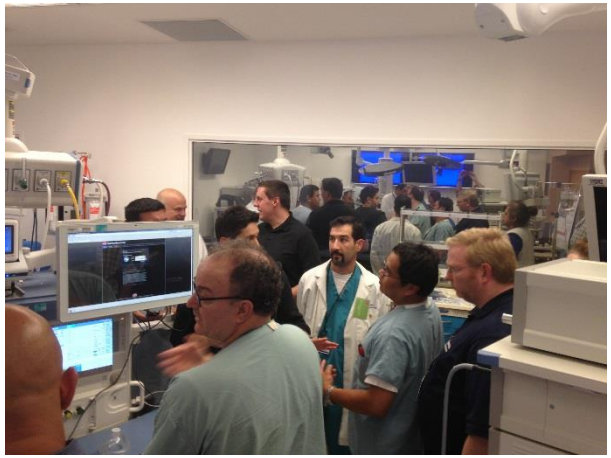


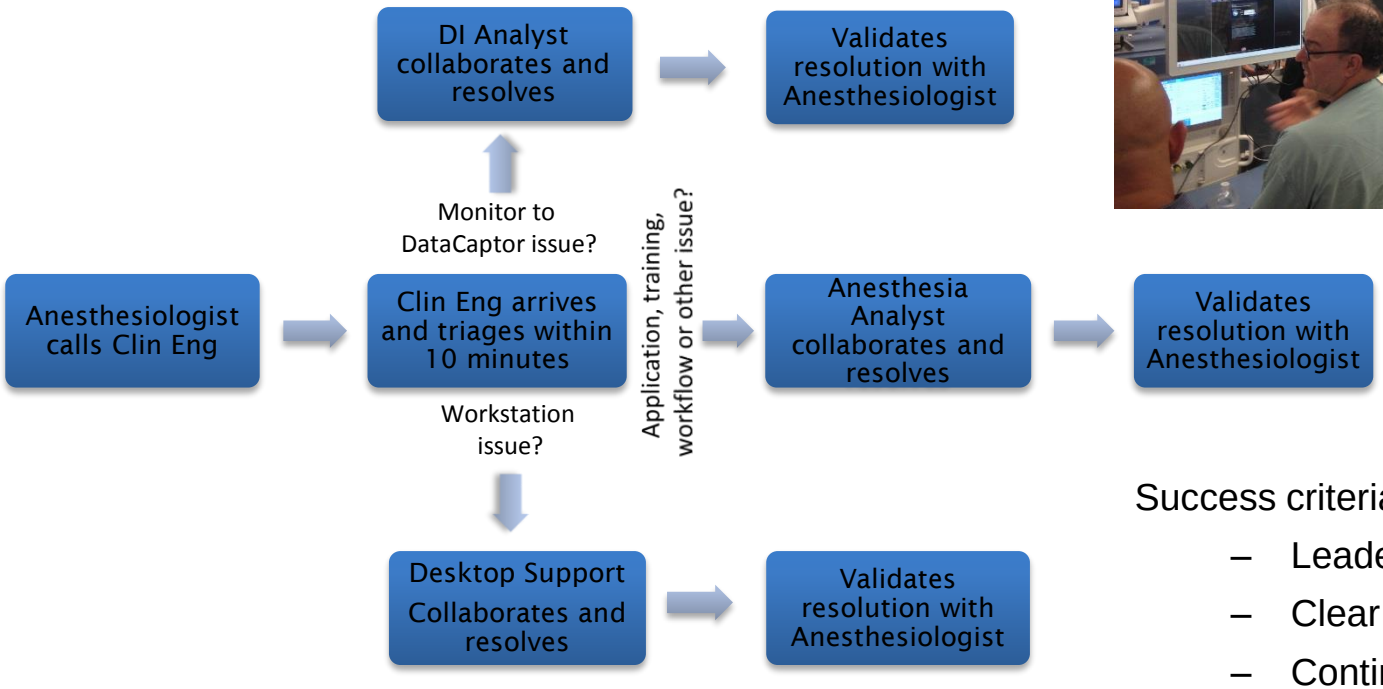
The Approach

- The Support Team

- Continuum was critical for success
- Implementation team members were retained in active roles
- Clinical Engineering Team
  - OR Clinical Eng
  - Device Integration Team
- Epic Optime/Anesthesia Team
- MD Champion, ad hoc collaborators
- Help Desk
- Epic Team (vendor)
- Ad-hoc resources from Desktop Engineering, Bridges, Systems Integration

Leveraging Clinical Engineering for in-OR issue triage





Success criteria:

- Leadership support
- Clear expectations
- Continuous training
- Clin Eng on-site

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The Outcome

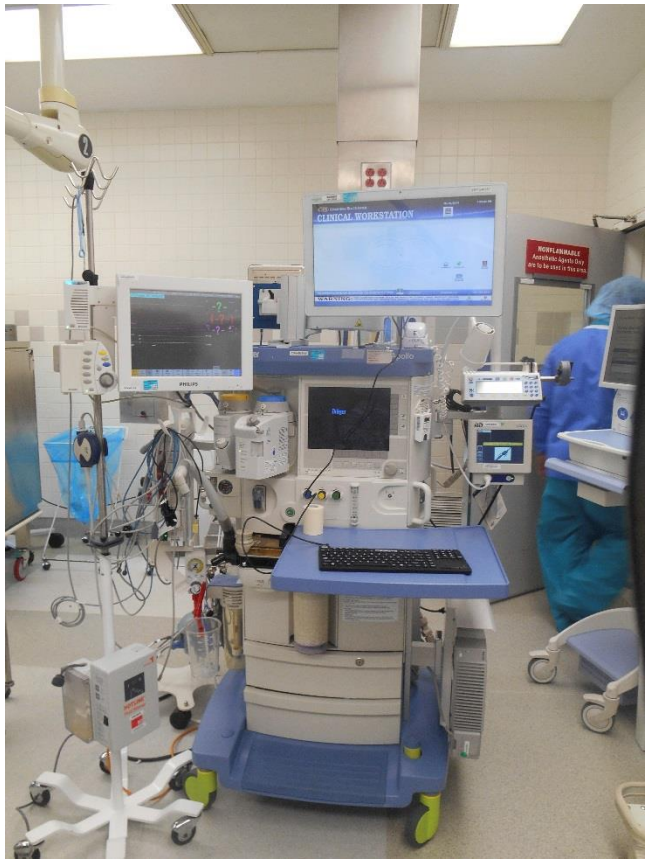
Devices integrated per machine:

- Philips monitor
- Anesthesia machine
- BIS monitor
- CCO monitor
- INVOS monitor
- Tangent workstation
- Neuron (as the data concentrator)

Total devices integrated/communication with EPIC – 490

In the first 3 months - total calls since go-live – 132

Tangent computer issues – 65
Neuron reset – 24
Server – 12
Neuron failure – 12
Damaged cables – 11
Operator Error – 8



A specific phone number was deployed to the end users for first call support and a quick reference card was installed on all anesthesia machines providing instructions on how to access device on/off/reset buttons.

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The Outcome

- Clinical Engineering is able to respond faster to calls than the I.T. staff
- Because the workstation was on an anesthesia machine the Clinical Engineering staff were seen as the responsible team for this new computer.
- Clinical Engineering staff have access to the read-only template in Epic.
- Our Clinical Engineers were taught how to resolve the most common issues to include user errors and navigating the application.
- This additional training allowed our Clinical Engineering team to resolve over 95% of calls related to this new application both from hardware and user sides.
- Supporting the application even at a limited capacity educated and empowered our staff and raised their confidence levels.
- Clinical Engineering is now seen not only as a hardware support team but a system support team.
- An unexpected outcome was that other Applications teams have reached out to us for support for their systems such as PACS and Imaging support.
- Collaboration is good for everyone.

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Thank You

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Pre-Procurement Support Considerations for Integrated Systems

Penn State Health
Milton S. Hershey Medical Center

Samantha Jacques, PhD, FACHE

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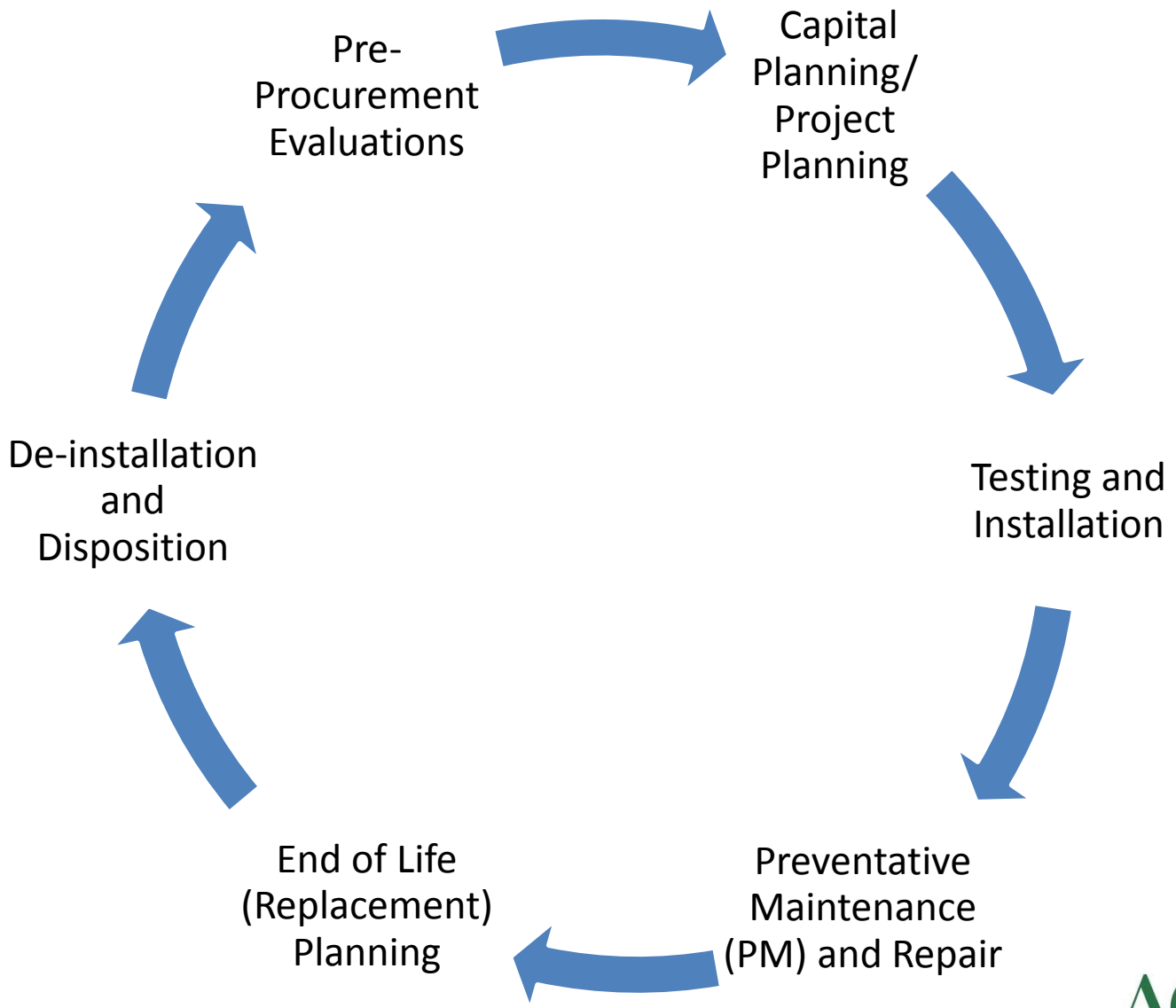
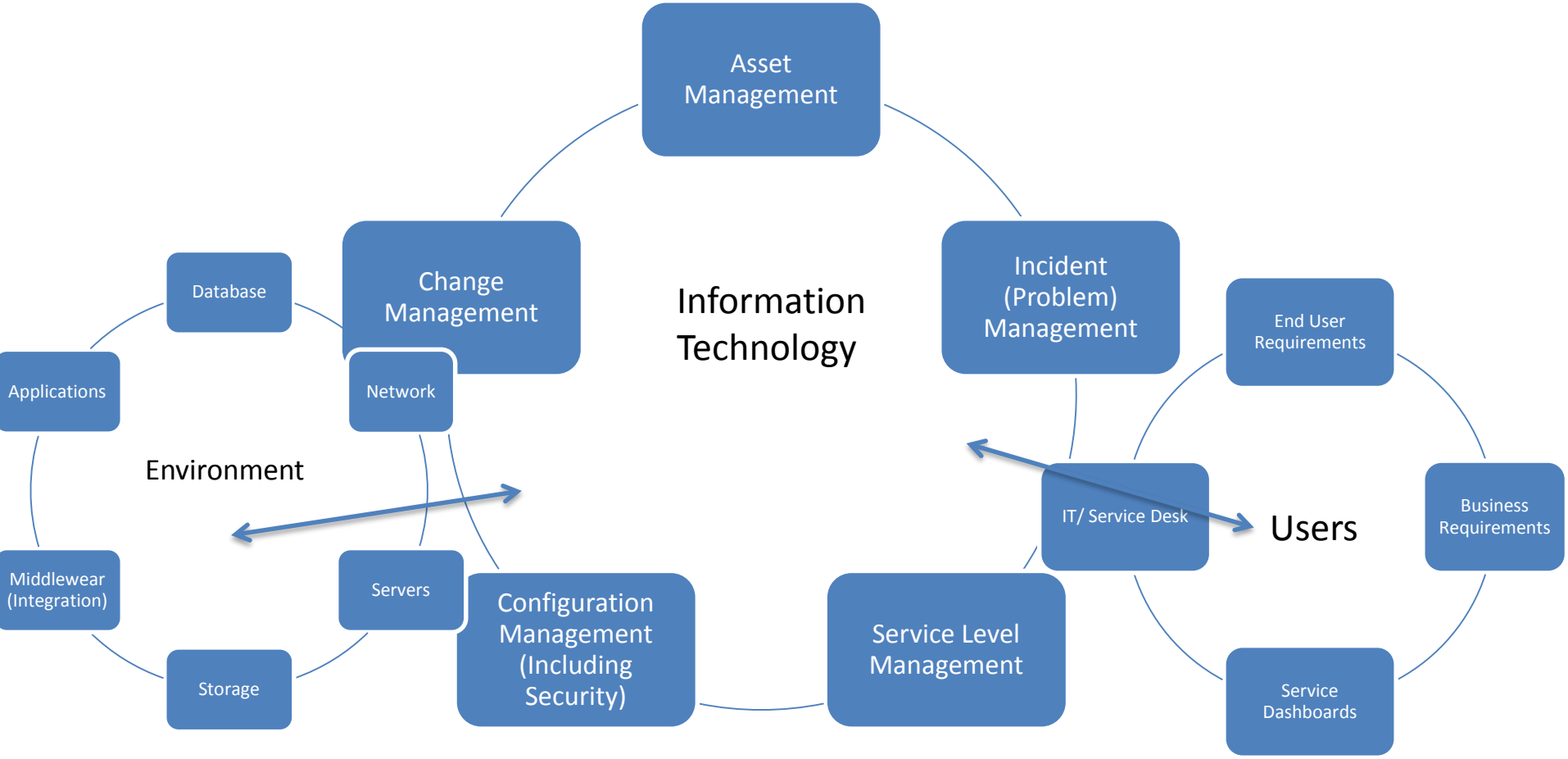
Equipment Lifecycle



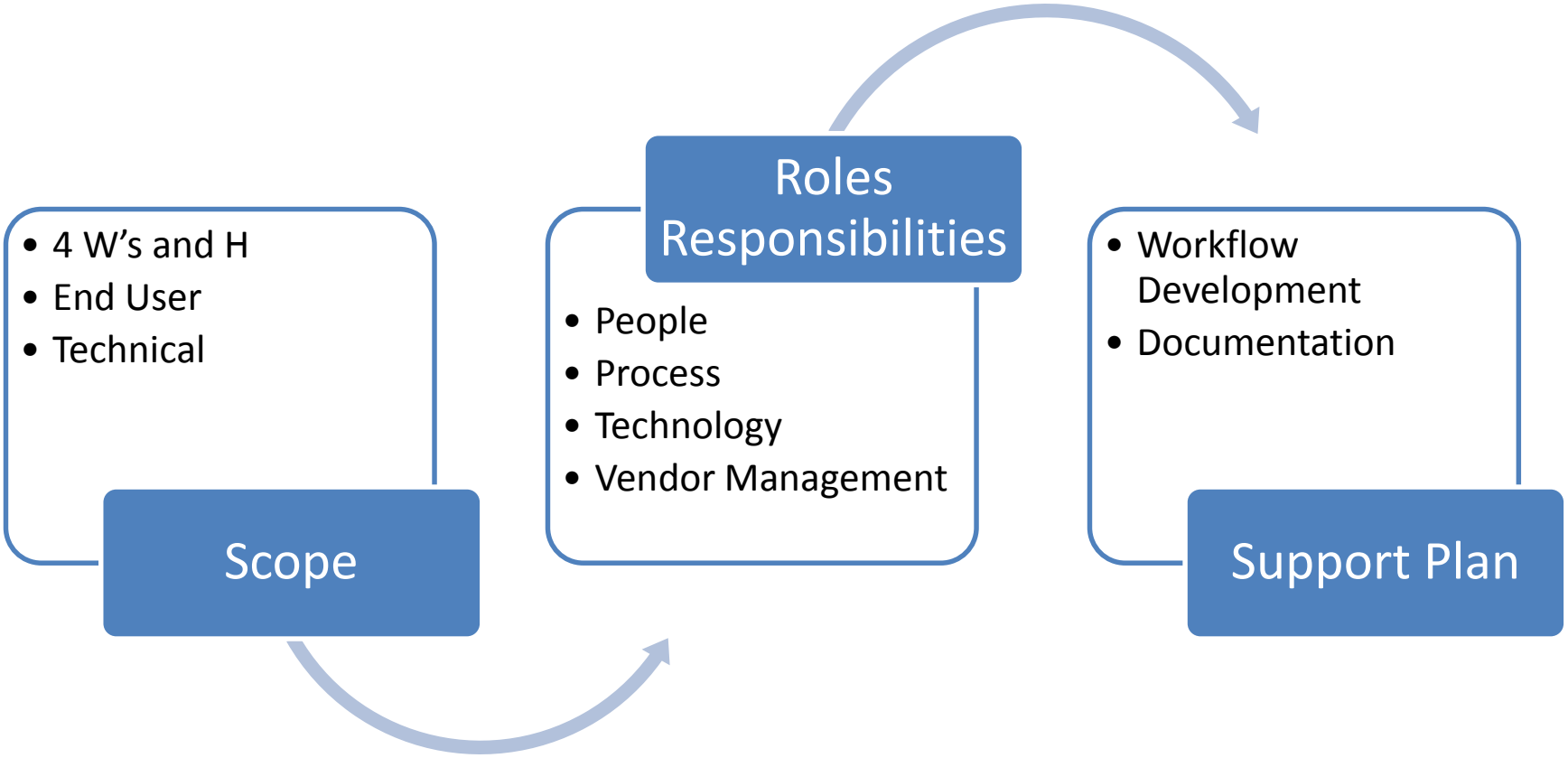
IT Systems Management



Normal Support Plans

SO, NOW WE HAVE ASCERTAINED WHO IS RESPONSIBLE....

Roadmap for Support Plan



Getting Scope Understood

- Who, What, Where, When, How of system needs
- End User Scope – processes, regulatory requirements, business needs, support needs
- Technical Scope - Servers, Database, Interfaces, Hardware, Software, Security, Access, etc.
- Take-Away
  - Ideal State Workflows and Architecture Diagrams

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Defining Roles/Responsibilities

- People
  - System Admin, IT Help Desk, Clinical Engineering, IT 2nd Tier Support, Vendor Support
- Process
  - Ordering supplies, add users, run reports, escalating issues, replaces hardware, downtime process
- Technology
  - Upgrades, Lifecycles, System Enhancements

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Understanding Vendor Management

- Ultimately one owner for vendor management
  - Vendor negotiation
  - Project Management and Implementation
  - Contract Management (T'&C's as well as $$)
  - Support Management
  - Vendor Scorecards

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Draft Support Plan

- Document History and Revisions
- System Application Overview/Vendor Contacts
- Technical Information
  - Server/Appliance Overview
  - Database Overview
  - Interface Overview
  - VPN/Firewall Overview
  - Network Overview
  - Workstation Overview
  - Application Overview
  - Storage Overview
  - Biomedical Equipment Overview
- Technical/Application/Architecture Diagrams
- Data Flow Overview
- Roles/Responsibilities
  - IT Service Areas
  - Clinical Engineering
  - End User
  - Vendor
- Support Processes
- Knowledge Articles
- Sign Offs

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Thank You

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Q&A

Come to the microphone OR
Submit questions to:

acce.aami16@gmail.com

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Closing Remarks & **Thank You!**

…And thanks again to our breakfast sponsor:

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