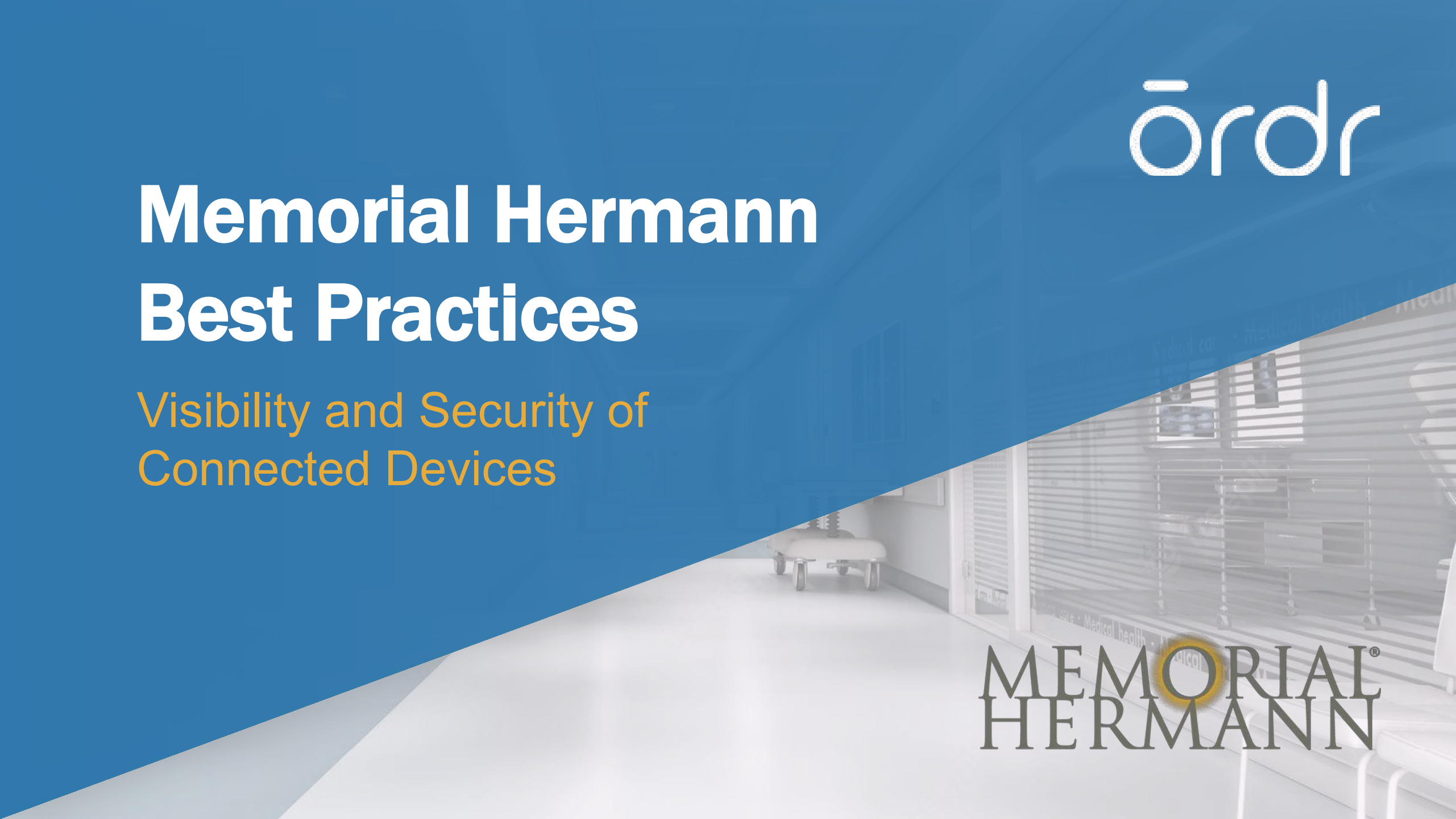
Memorial Hermann Best Practices

Visibility and Security of Connected Devices



Agenda

- Introduction
- Memorial Hermann Security Challenges
- How Ordr Helps
- Deployment Details
- Future Use Cases

Introduction – Ben Stock

Benjamin Stock is the Director of Healthcare Product Management at Ordr. Previously, Ben worked as the Director of Clinical Equipment Systems and Project Support at SSM Health St. Louis, MO. With more than 15 years of experience in healthcare technology management, his wealth of knowledge in the Clinical Engineering space allows him to be a wonderful advocate for Ordr healthcare customers. Ben is also a Certified Biomedical Equipment Technician (CBET).

Introduction – Umair Siddiqui

- **AVP Clinical Engineering & Asset Management: Memorial Hermann Health System, Houston TX**
- **Collaborative leader with 20+ years of experience in HTS**
- **Leads the Largest HTS program in Southeast Texas**
- **Responsible to manage of 100K+ owned & 20K+ rental equipment**
- **Strategic Planning, Program development, Safety Compliance, Executive Leadership, Operations Management**
- **Master of Science in Biomedical Engineering from University of Connecticut**
- **Master in Business Administration from University of Houston**

Introduction – Memorial Hermann Health System (MHHS)

Memorial Hermann Health System

- Located in Houston TX
- **114 years**
- **One of the largest** not-for-profit health systems in Southeast TX
- **6,100** affiliated physicians
- **29,000** employees
- **17** hospitals
- **270** care delivery sites
- One of the nation's busiest **Level I** trauma centers
- 100K total connected devices including 20K connected medical devices

Biomed Team Structure

Clinical Engineering Services

crothall healthcare

Umair Siddiqui
AVP, Asset Management & Clinical Engineering

Ryan Sanders
VP Operations

Shelley Lynn Ural
CE Coordinator

Anupama Khandavalli
Data Analyst

Jeremy Ramsey
RRM - Biomed

Nick G. Maltas
RRM - Imaging

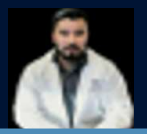
Rick Bowie
Dir, Asset Management & Clinical Engineering

Memorial Hermann

Crothall Healthcare

- Jerry Williams - Nuc Med
- Barry Creasman - Cath Lab
- Albert Hernandez - Cath Lab
- Robert (Chad) Hunt - CT/MRI
- Bruce Bowen - CT/MRI
- Dan Carr - CT/MRI
- Pat Gilmore - CT/MRI

Michael Magee
Amb Unit Dir
Biomed - 3

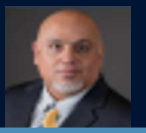


Li Chia
GH Unit Dir
Biomed - 3 Imaging - 1
Biomed - 1 Elect - 1

Jonathan Young
KT/CY Unit Dir
Biomed - 3 Imaging - 1
Biomed - 2

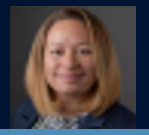
Daniel Clesi
MC Unit Dir
Biomed - 3 Imaging - 1 Elect - 1
Biomed - 1

Joel January
NE Unit Dir
Biomed - 2 Imaging - 1
Elect - 1



Hissman Shakh
SE/PL Unit Dir
Biomed - 4 Imaging - 1
Biomed - 1 Elect - 1

Robin Williams
SW/SL Unit Dir
Biomed - 6 Imaging - 1 Elect - 1
Biomed - 1 Elect - 1 Admint - 1



Angela Perry
TW Unit Dir
Biomed - 5 Imaging - 1
Biomed - 1 Elect - 1 Admint - 1

Adeel Hassan
TMC Unit Dir
Biomed - 12 Imaging - 5 Elect - 2
Biomed - 2 Admint - 1

Advancing Health. Personalizing Care.

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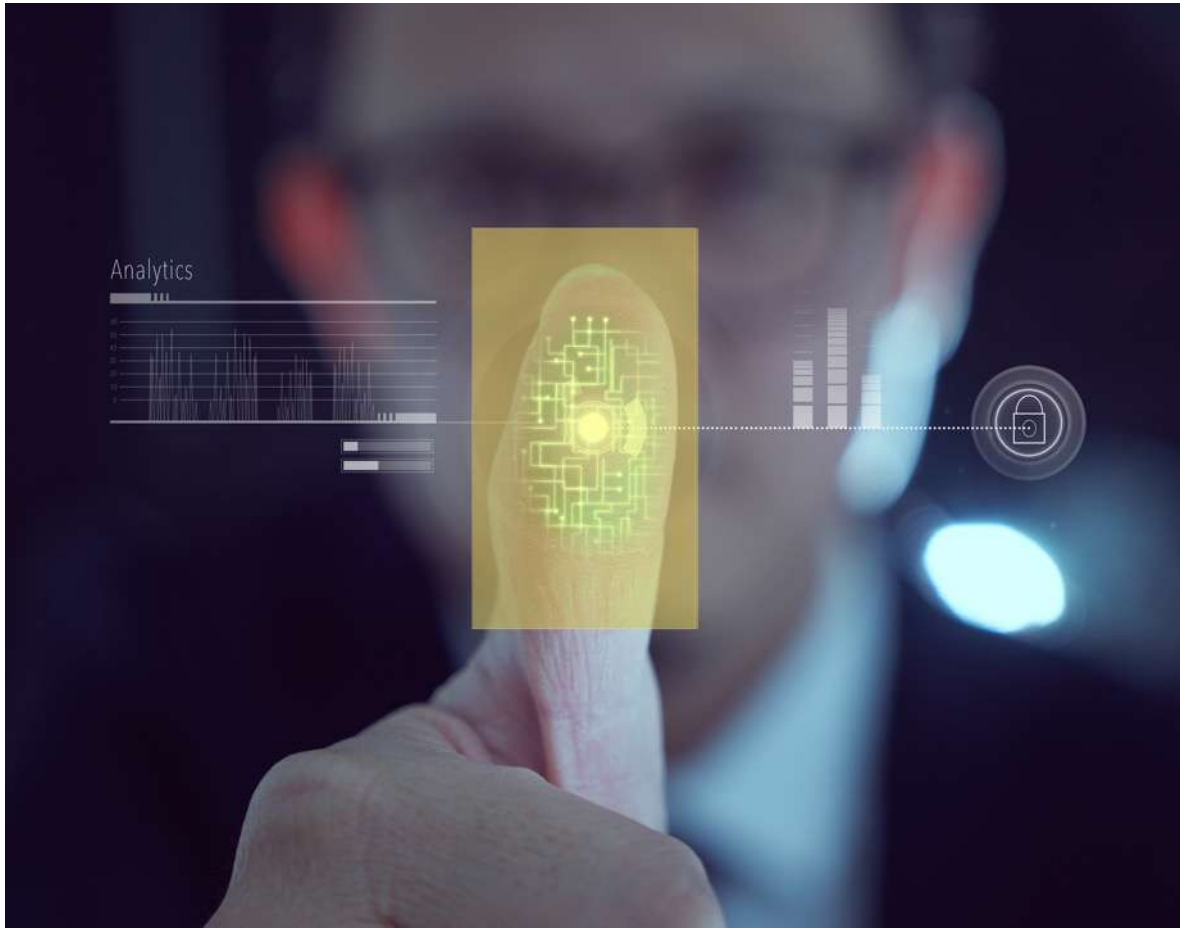
MHHS Cyber Security Team

MHHS Cyber Security Team

Technical Security Controls

- **Web Filter**
- **Email Filter**
- **EDR**
- **SIEM**
- **Firewalls**
- **Remote Access**
- **Application Whitelisting**
- **Incident Response**
- **Vulnerability Management**
- **Medical Device Security Monitoring - Ordr**



MHHS Security Challenges

Cyber Security Needs

Visibility of East/West traffic

- **Inter-campus traffic can be challenging**
- **Identification of devices**
- **What is it**
- **Where is it**
- **Is it healthy**
- **Is it's behaving**

Biomed/Clinical Engineering Needs

Genesis for Crui at Memorial Hermann

- **Biomed needed visibility into device inventory**
  - **What is it**
  - **Where is it**
  - **What is it doing (how is it being utilized)**

How Ordr Helps – Device Insights

Traffic Visibility

- See East/West flows at a campus

Vulnerability Information

- Identify devices needing patches

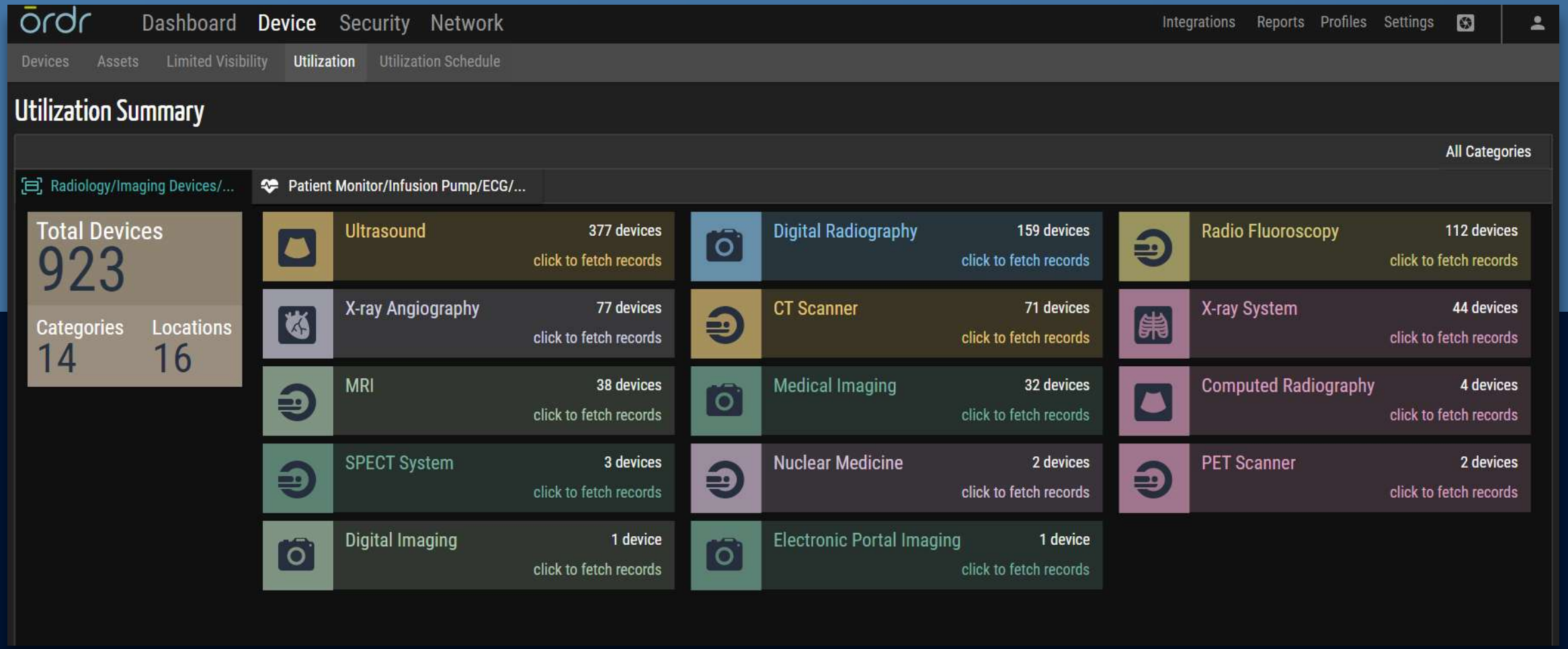
Device Classification

- Workstation (laptops & desktops)
  - OS
  - Manufacturer
  - Model
  - Serial
  - Mac Address
- Office devices (IP phone, printers)
- Facility devices (UPS, cameras)
- IoT devices (more cameras, pneumatic tube systems)
- Medical devices (MedStation systems, ultrasound, infusion pumps, Imaging modalities)

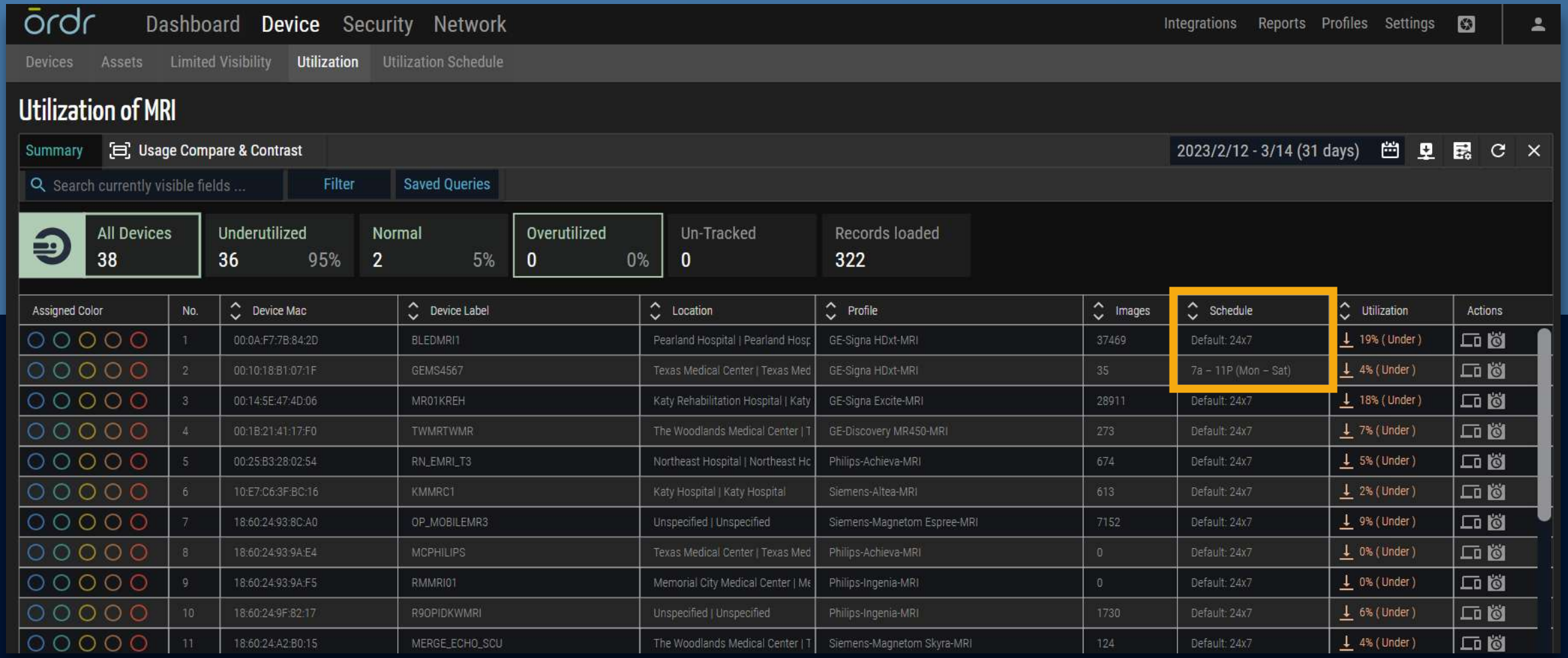
Behavioral Violations

- Provide context of normal device traffic

Device Utilization Summary

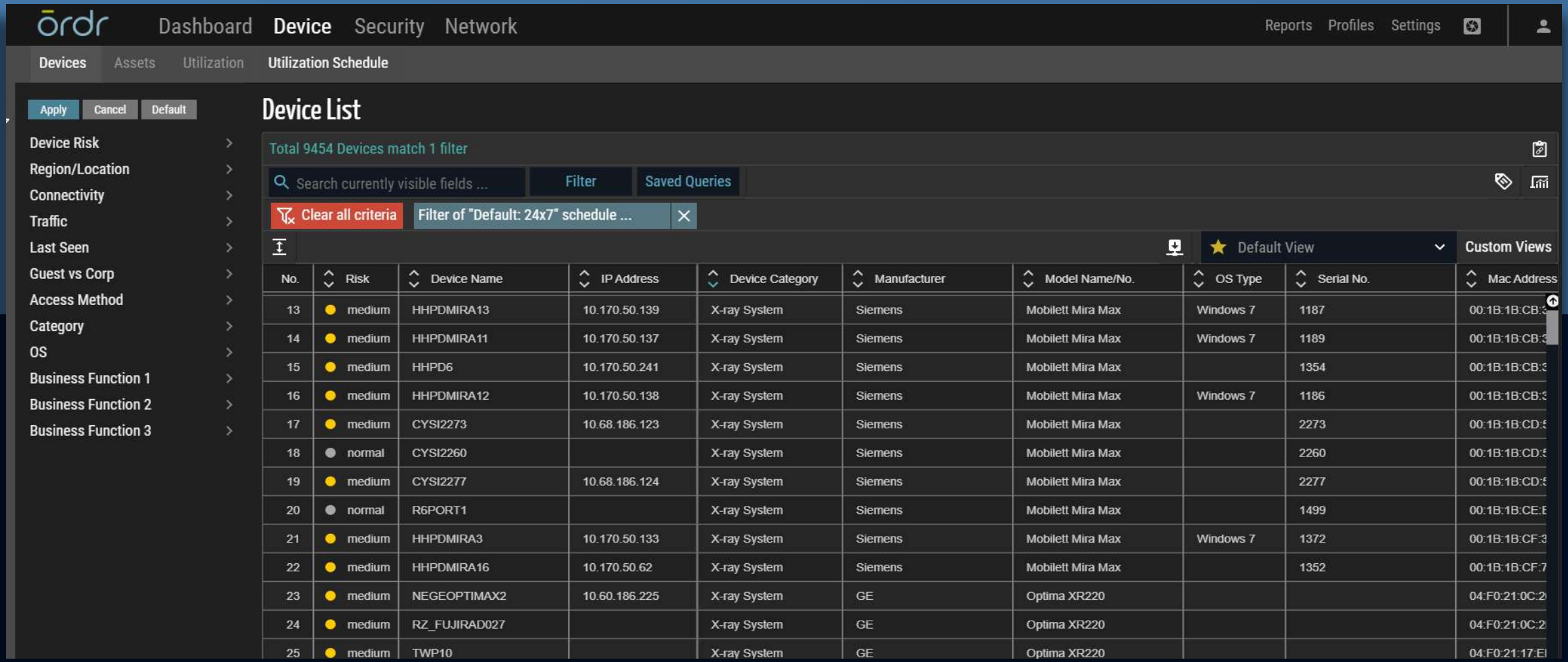


Identify MRI Devices With Over/Under Utilization



Assigned Color	No.	Device Mac	Device Label	Location	Profile	Images	Schedule	Utilization	Actions
	1	00:0A:F7:7B:84:2D	BLEDMRI1	Pearland Hospital | Pearland Hosp	GE-Signa HDxt-MRI	37469	Default: 24x7	19% (Under)	
	2	00:10:18:B1:07:1F	GEMS4567	Texas Medical Center | Texas Med	GE-Signa HDxt-MRI	35	7a – 11P (Mon – Sat)	4% (Under)	
	3	00:14:5E:47:4D:06	MR01KREH	Katy Rehabilitation Hospital | Katy	GE-Signa Excite-MRI	28911	Default: 24x7	18% (Under)	
	4	00:1B:21:41:17:F0	TWMRTWMR	The Woodlands Medical Center | T	GE-Discovery MR450-MRI	273	Default: 24x7	7% (Under)	
	5	00:25:B3:28:02:54	RN_EMRI_T3	Northeast Hospital | Northeast Hc	Philips-Achieva-MRI	674	Default: 24x7	5% (Under)	
	6	10:E7:C6:3F:BC:16	KMMRC1	Katy Hospital | Katy Hospital	Siemens-Altea-MRI	613	Default: 24x7	2% (Under)	
	7	18:60:24:93:8C:A0	OP_MOBILEMR3	Unspecified | Unspecified	Siemens-Magnetom Espree-MRI	7152	Default: 24x7	9% (Under)	
	8	18:60:24:93:9A:E4	MCPHILIPS	Texas Medical Center | Texas Med	Philips-Achieva-MRI	0	Default: 24x7	0% (Under)	
	9	18:60:24:93:9A:F5	RMMRI01	Memorial City Medical Center | Me	Philips-Ingenia-MRI	0	Default: 24x7	0% (Under)	
	10	18:60:24:9F:82:17	R9OPIDKWMRI	Unspecified | Unspecified	Philips-Ingenia-MRI	1730	Default: 24x7	6% (Under)	
	11	18:60:24:A2:B0:15	MERGE_ECHO_SCU	The Woodlands Medical Center | T	Siemens-Magnetom Skyra-MRI	124	Default: 24x7	4% (Under)	

Show Devices With 24/7 Utilization Schedule



How Ordr Helps - MDCSOC

Medical Device Compliance and Security Oversight Committee (MDCSOC)

Biomed/Clinical Engineering & Cyber Security are now meeting

- Monthly cadence
- Cross talk team actions relating to security events
- Validation of Inventory – CVEs, Win Patching, OS Verification, Recalls & Remediations
- Equipment Utilization Dashboard
- Imaging Equipment Planning & Replacement Analysis

Establish and enhance how we respond to incidents

- How do we Detect, Notify, Remediate

Measure and remediate medical device vulnerabilities in the environment

- What needs attention
- Who owns the remediation
- What is current state and are we making progress

How Ordr Helps – Threat detection

Detected a very real threat and allowed the combined teams to neutralize its impact

Unexpected traffic

Mapped to Medical Device Type

Mapped to facilities

Allowed for fast remediation and long term solution

MHHS – Ordr Deployment

Management Console (“Painless”):
- Ordr provided OVA
- Ordr support facilitated the configuration

Sensor Deployment (“Straight Forward”):
- Get the ports from Net Engineering
- Rack, connect the power, and span ports then verify in Ordr

Trouble shooting:
- If a sensors didn’t sync, a reboot generally solved the problem.
- Ordr sent the sensors pre-configured
  - Only by exception did IPs need to be changed because our network needs
- One instance where the sensor was showing the span ports were not connected but Ordr assisted and the issue was fixed quickly.

2
Sensors
spanning
29 campuses
100K+
Observed
Devices
30K+
Medical Devices

ordr

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Future Use Cases with Ordr

Integrations:

GE Healthcare

Monitoring devices and traffic on the Carescape network

nuvolo

Enrich device data for enhanced IT component

BD

Infusion Pumps Utilization Dashboard

INTUITIVE

Utilization Dashboard for Lease Program

Questions?

Ben Stock
bstock@ordr.net
https://ordr.net/

Umair Siddiqui
Umair.Siddiqui@memorialhermann.org

Thank You!