

2024-2025 Educational Webinar Series

What does “Clinical” mean to you in Clinical Engineering?

June 12, 2025

Speakers

Izabella Gieras

Cedars Sinai Health System

Jennifer McFarlane

Huntington Hospital

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2024-2025 Educational Webinar series by



About the Moderator



Carlos DeSousa, BS, CBET, CCE
Stanford Medicine Children's Health
Cdesousa@StanfordChildrens.org



Senior Clinical Systems Engineer

Stanford Medicine Children's Health / Lucile Salter Packard Children's Hospital

Career Overview:

- Began career in 2009 as an Entry-Level Equipment Technician at the University of California, San Francisco.
- Extensive background in:
 - **Healthcare Technology Management (HTM):** Equipment Acquisition, Installation and Implementation, Maintenance and Repair, Safety and Compliance, User Training and Support, Equipment Life Cycle Management, Request for Proposals, and Construction projects.
 - **Clinical System Implementations:** Including infusion/pharmacy technology, pre/intra-operative technologies, bedside monitoring, ECG diagnostics, and research.
 - **Key Projects:** Leading the expansion of the new hospital wing for inpatient and Perioperative areas, deploying clinic equipment, managing multiple Clinical Applications upgrades, and implementing Bedside Alarm Mitigation strategies.
 - **Medical Device Cybersecurity:** Integral in shaping the cybersecurity program at LPCH.
- Progressed from General Equipment Tech to Senior Equipment Tech, managing preventive maintenance and corrective work orders on Class I-III devices across operating rooms, bedside care, and dialysis.

Education:

Bachelor's Degree in Biomedical Engineering (2009) DeVry University, Fremont Campus

Certifications:

- Certified Biomedical Equipment Technician (CBET)
- Certified Clinical Engineer (CCE)

Personal Interests:

- Enjoys traveling with family.
- Pursuing a lifelong passion for obtaining a black belt in Brazilian Jiu-Jitsu.

Logistics

- ❖ All attendees have their microphones muted during the presentation.
- ❖ Questions to the panelists must be submitted via the “Q&A” feature in Zoom at any time. They will be addressed at the Q&A portion.
- ❖ If there is any urgent issue, please use the “chat” feature to communicate with the host/moderator.
- ❖ Please remember to complete the webinar evaluation after attending. A link will be provided at the end.

About the Speaker



Jennifer started working at the hospital as a Biomedical Technician. She served in that position for 6 years.

Her experience there made her realize she wanted to be a Registered Nurse, so she returned to school and earned an Associate's degree in Nursing and was hired as a new graduate in the hospital's ICU. She continued her education earning a BSN and an MSN. After earning her MSN, she was hired as a Clinical Nurse Specialist (CNS) and has served in that position for many years, often assisting with equipment needs assessments and implementations with the Clinical Engineering department. Most recently she has completed her Doctorate in Nursing. She plans to continue to work in the CNS position.

Jennifer McFarlane, DNP, RN, CNS, CCRN

jennifer.mcfarlane@huntingtonhealth.org



About the Speaker



**Izabella A. Gieras, MS, MBA, CCE,
CSSBB, FACCE, AAMIF**

Izabella.Gieras@cshs.org



Since October 2021, Izabella has served as the director of the Clinical Engineering Departments at both Huntington Hospital in Pasadena and Cedars-Sinai Medical Center in Beverly Hills, CA as part of the affiliation between the two hospitals. Prior to the affiliation, Izabella has been with Huntington Hospital since 2010. Before coming to Huntington, Izabella worked as the ARAMARK Healthcare director of the clinical engineering department at The Mount Sinai Medical Center in New York City. Prior to that, she was with William Beaumont Hospital as the Director of Technology Management.

Izabella leads a team of managers, clinical engineering technicians, project coordinators, clinical engineers as well as administrative staff. The departments support equipment maintenance, technology management, risk assessment, safety and new equipment evaluations and acquisitions as well as medical device integration for over 40,000 devices.

As the past president of ACCE (American College of Clinical Engineering) and her involvement in healthcare technology management, Izabella has been invited to present on medical technology, human factors engineering and healthcare safety at conferences worldwide, including HTAi (Healthcare Technology Assessment International), HIMSS (Healthcare Information and Management Systems Society) and AAMI (Association for the Advancement of Medical Instrumentation).

Izabella holds a B.S. in Electrical Engineering from the University of Cape Town in South Africa, a M.S. in Biomedical Engineering from the University of Connecticut and an MBA from Walsh College in MI. Izabella has also received a CSSBB (Certified Six Sigma Black Belt) from the Certification Board of the American Society of Quality and has a CCE (Clinical Engineering Certification) from the U.S. Board of Examiners and Healthcare Technology Certification Commission. Additionally, Izabella received the Healthcare Technology Management Leadership award in 2015 from AAMI and the Professional Achievement in Management/Managerial Excellence Award from ACCE in 2016.

Session Description

Today's healthcare environment is composed of a diverse group of stakeholders. Clinical Engineering/HTM, being one of the key stakeholders, works very closely with clinical and medical staff, IT, Supply Chain, Infection Control and more. The two presenters will discuss how special these partnerships are, especially the one between Clinical Engineering and the end users when it comes to all aspects of medical equipment management.

What to Expect:

Partnerships: Learn from our expert presenters about the special collaboration between Clinical Engineering and end users, focusing on the practical aspects of medical equipment management.

Essential Skills: Understand the key competencies required to support the continued success of these partnerships and its ongoing evolution.

Real-World Applications: Dive into compelling case studies that showcase the cross pollination of "clinical" expertise into the healthcare technology.

We are excited to present this opportunity to enhance your knowledge and contribute to the future success of our field

“Clinical” from the Clinical Engineering Perspective



Affiliation – Cedars-Sinai/Huntington Health in 2021

Huntington Hospital Affiliation with Cedars-Sinai Becomes Official

Published on Wednesday, August 4, 2021 | 12:18 pm



The affiliation between [Huntington Hospital](#) and [Cedars-Sinai Health System](#) became official Wednesday, with the completion of the appropriate regulatory approvals. The affiliation will strengthen Huntington's long-term commitment to providing affordable, accessible, high-quality care to the San Gabriel Valley.



Cedars-Sinai Medical Center - Clinical Engineering



- Located in Beverly Hills, CA
- Licensed for 889 beds
- Over 14,000 employees
- 91,014 patients seen in the ED annually
- Over 32,000 surgeries annually
- Over 105 anesthesia locations
- 4500+ end user computing devices
- 34 members strong (BMETs, CEs, Imaging Specialists, Manager, Director, Support Staff)
 - Over 33,000 medical devices
 - Reports to Enterprise Information Services

Huntington Health - Clinical Technology



- Located in Pasadena, CA
- Level II Trauma Center with 619 licensed beds
- Bariatric & Stroke Center
- 18 Operating Rooms
- 3 DaVinci Robotic Systems
- 6 Cath Labs & IR Suites
- 6500+ personnel
- Affiliate of the Cedars-Sinai Health System
- 12 members strong (BMETs, CE, Manager, Director, Support Staff)
 - Over 11,000 medical devices
 - Reports to Enterprise Information Services

Origins of Clinical Engineering



Clinical engineering is a specialty within [biomedical engineering](#) responsible for using [medical technology](#) to optimize [healthcare](#) delivery.

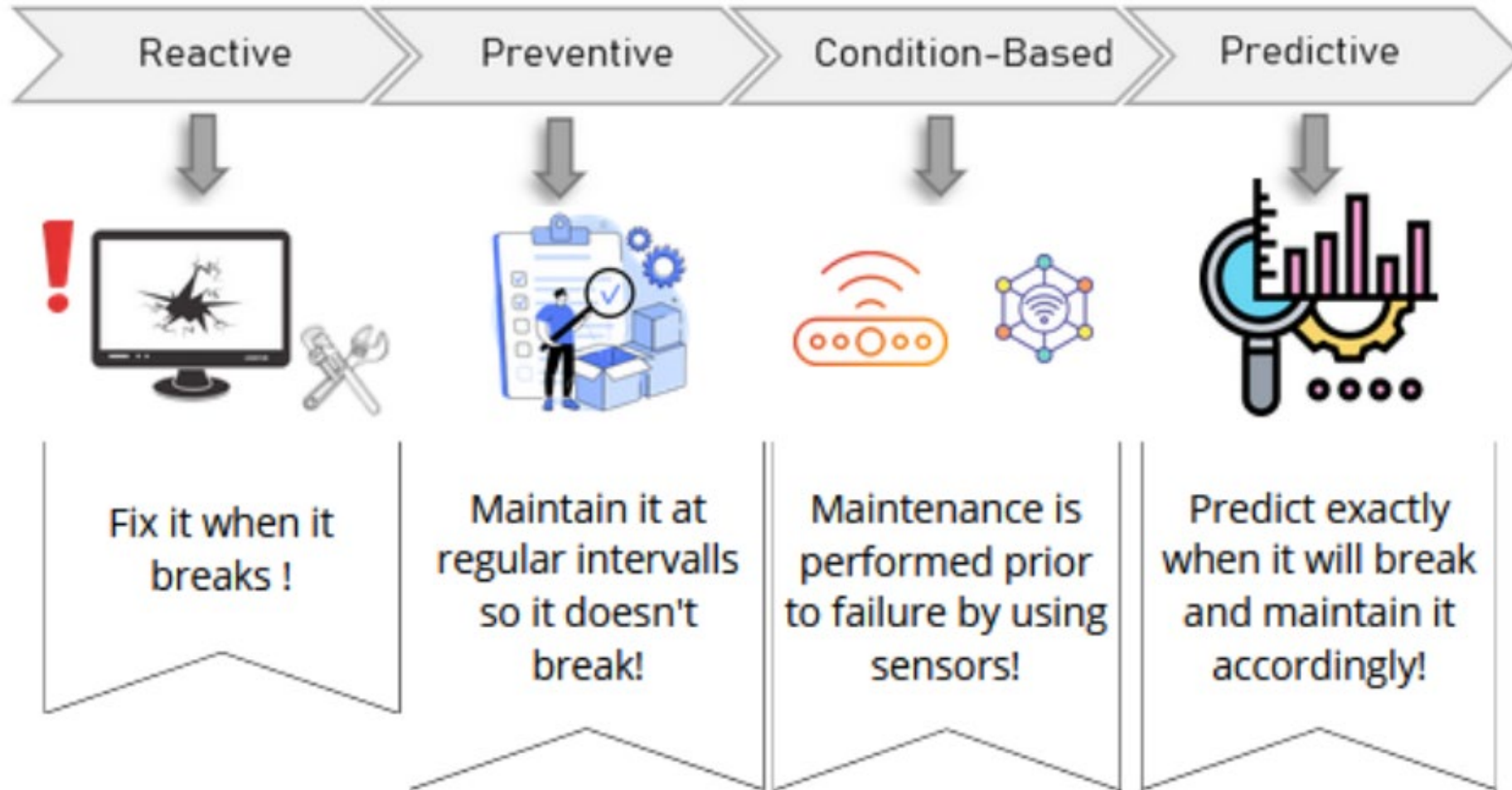
Clinical engineering is a relatively new profession, first recognized in the 1940s, but was not given a title until 1969.

The term *clinical engineering* was first used in a 1969 paper by Landoll and Caceres. Caceres, a [cardiologist](#), is generally credited with coining the term.

In the early 1970s, the profession started to expand, estimated 5,000 to 8,000 clinical engineers, or 1 per 250 hospital beds.

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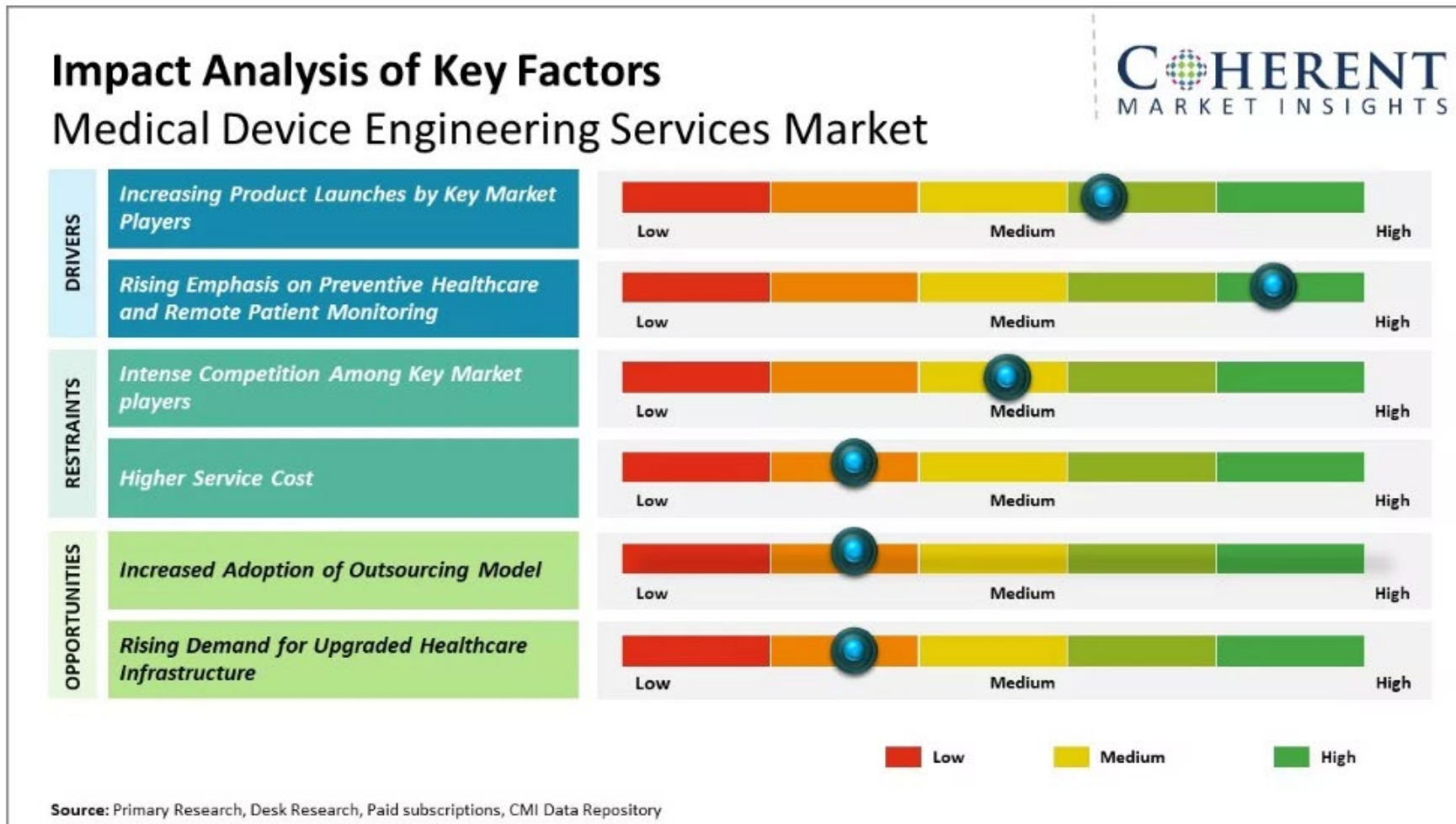
Past, Present and the Future



Discovering the Possibilities

Global Medical Device Market Growth

Global medical device engineering services market is valued at \$6.3 billion in 2025, estimated to grow to \$13.63 billion by 2032



The **average** biomed tech is responsible for up to **1,200** devices



The CEO Magazine

THE IMPORTANCE OF MEDICAL DEVICES IN MODERN HEALTHCARE

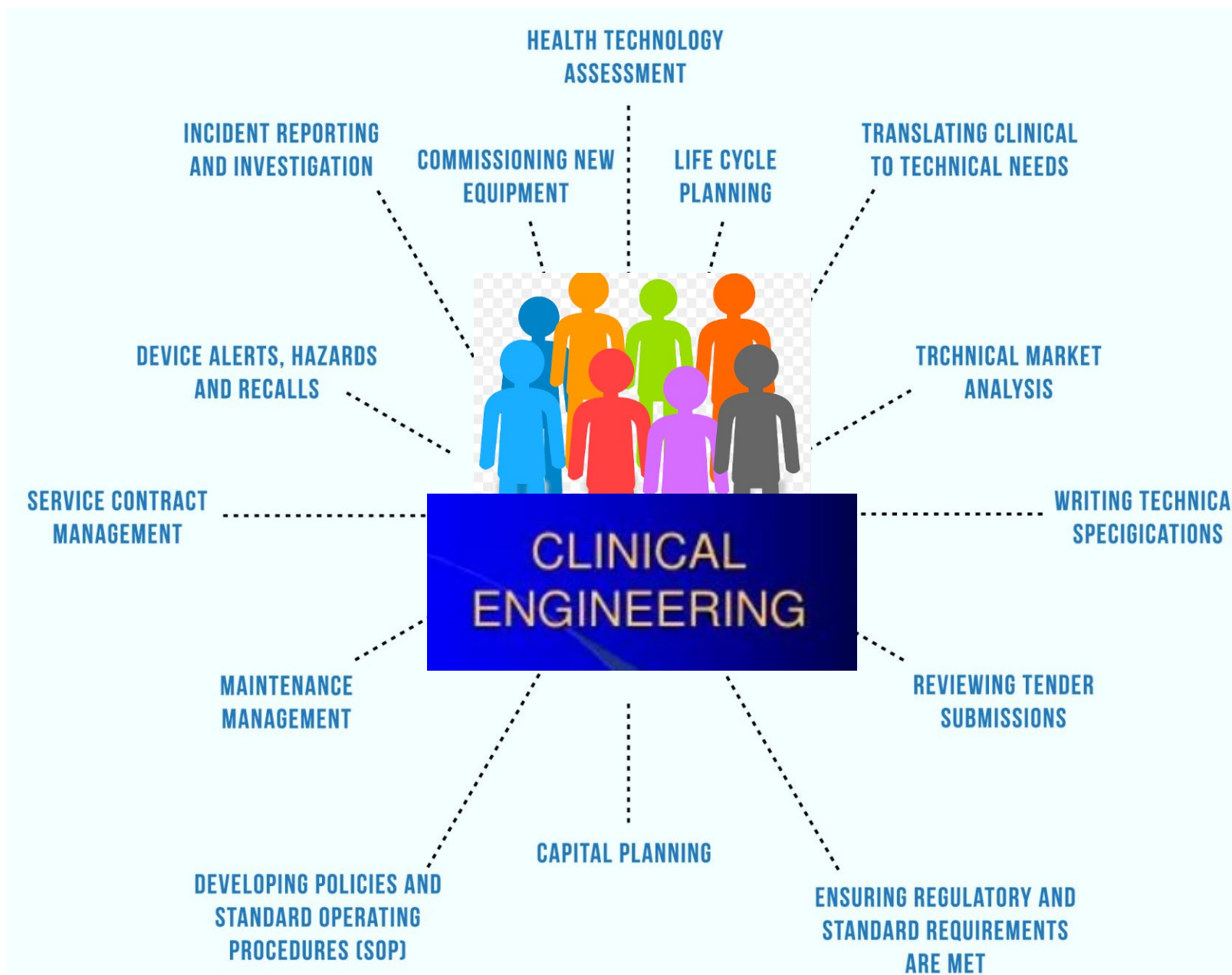


The Future Outlook for **Biomedical Equipment** Technicians



The need for skilled technicians to maintain life-saving medical equipment is increasing rapidly, driven by an aging population and continuous technological advancements. This means a bright future awaits biomedical equipment technicians, with the U.S. Bureau of Labor Statistics projecting a *13% job growth from 2022 to 2032*.





The Foundations

- Education
- Customer Satisfaction
- Communication
- Technically savvy
- EQ

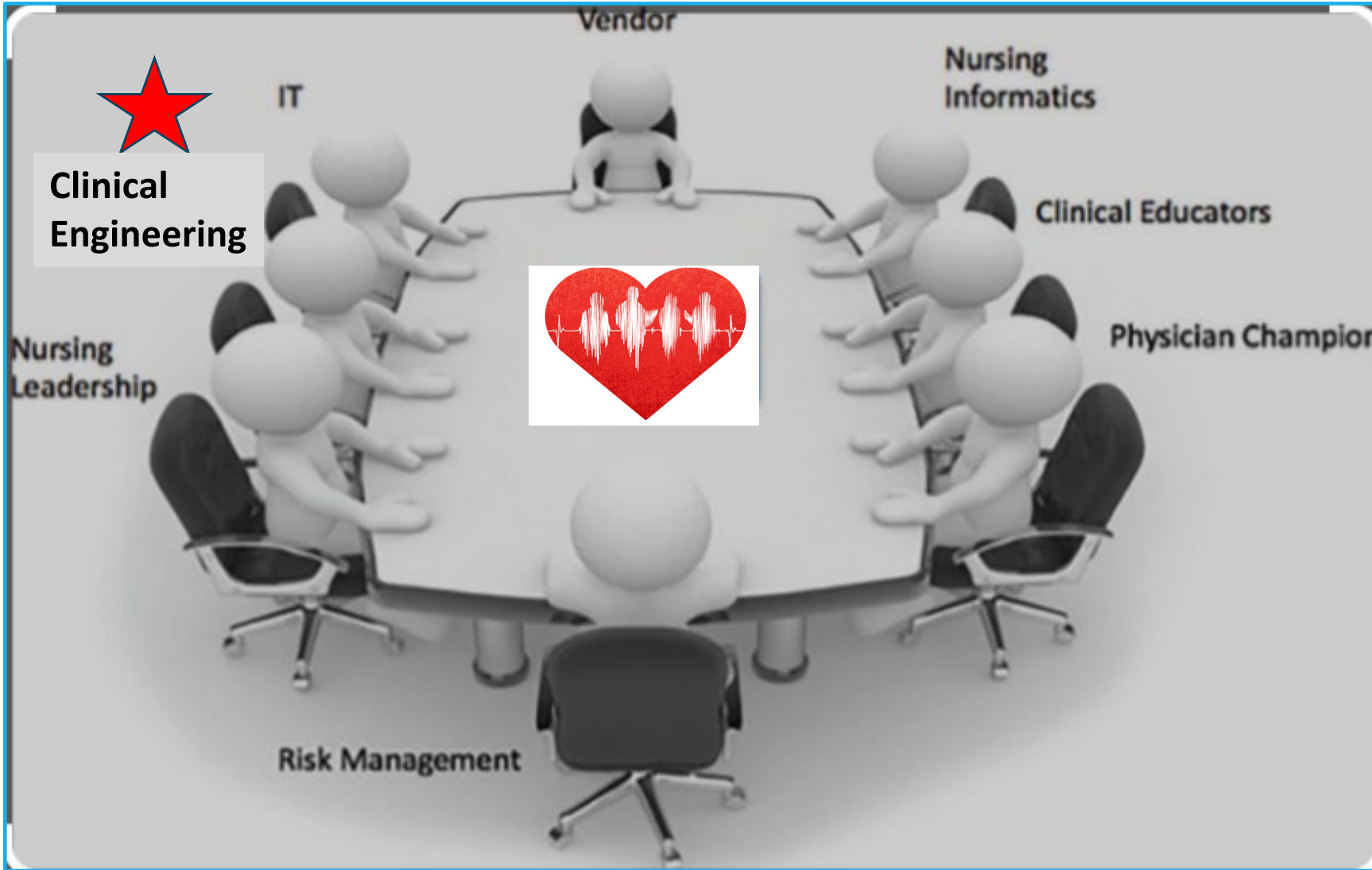


“Clinical” in Daily Operations

- Partnership with clinical stakeholders
 - Equipment Evaluations
 - Product Fairs
 - Simulations
 - Clinical Evaluations
 - Risk Assessments
 - Education
 - Alarm management
 - Incident investigations
 - Recalls
 - Financial Analysis



Relationship Building with Clinical Engineering



CLINICAL ENGINEERING DEPT.
SAFETY CHECKED

BY _____
DATE _____

This equipment is in storage.
Contact Biomedical/Clinical
Engineering Department
before using.

SERVICED

Date _____ By _____

Due _____

Service Performed CAL PM PT ST

DO NOT REMOVE LABEL

Recommendations to Optimize “Clinical” in Clinical Engineering

- Involve Clinical/Nursing Education dept soonest
 - Develop a new technology calendar
 - For each calendar year
 - Multi year if projects span more than one year
- Invite clinical representatives to staff meetings
- Partake in clinical rounds
- Attend clinical related committees such as Nursing Council, Patient Safety, Medication Safety, etc

Recommendations



Collaborative Projects - Examples

- **Infusion Pumps**

- System wide multidisciplinary committees
- Product Fairs and Simulations
- Education

- **Patient Monitoring**

- Multi year roadmap
- Technology needs assessment
- Technology configurations



“Clinical” from the Clinical Perspective



The Clinical Side



The average ICU or ED RN needs to know how to operate 50+ types of equipment



Fundamental importance of including end users



Nurses manage multiple patient problems and multiple patients at once



Collaboration and Respect are key drivers of the relationship between engineers/engineering technicians and nurses

Planning Equipment Evaluations



- Starts with an evaluation by ECRI
- Meet to discuss options
- Determine which criteria will determine which devices to bring in for interaction with nursing
- Determine the best way to show nurses the devices and how they will be evaluated
- Conduct evaluation with CNS, Educator or another leader rounding with reps or and introducing them and explaining what we care doing

Zoll Defibrillator

- When evaluating which defib to purchase to replace defibs house wide, we noted it had a double hose BP cuff
 - Rep stated we could purchase a single hose and use that
 - Went live with it and immediately had problems when the patient was hypotensive.....
 - Changed to double hose and used double hose cuffs 7/2023-7/2024
 - Received letter saying we could use a 2:1 adapter, that it had met their testing requirements and...



ZOLL

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January 17, 2024

Isabella Gieras
Director, Clinical Engineering
Cedars-Sinai Medical Center
8700 Beverly Blvd., South Tower, Suite A931
Los Angeles, CA 90048

Dear Ms. Gieras:

Thank you for your interest in the ZOLL® X Series® Monitor/Defibrillator. ZOLL has tested the device for use with an adapter from the dual lumen blood pressure hose to a single lumen cuff and verified that it meets the published specifications as indicated in the X Series Operator's Guide.

Sincerely,

Kristin Spang
Senior Manager
Global Product Management



IV Pumps

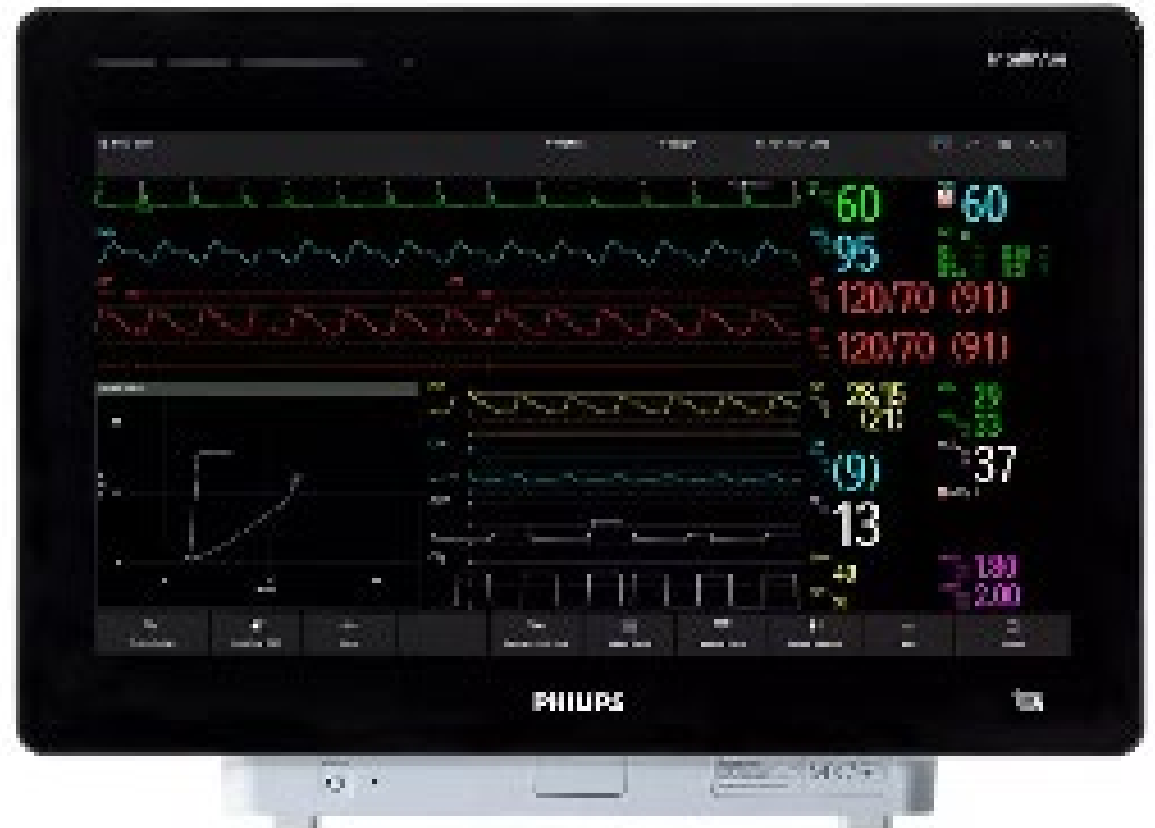


- Sigma pumps purchased in 2008
 - Air in line issues
 - Volumes left in bag after delivery of medication or fluid
- Replacement Planning started in 2015
- December 2023 “pump fair” where 4 vendors were invited to show their large volume IV pumps
 - Alaris was selected
- 2025 Planning for implementation began
 - GoLive 4/8/25

Noninvasive BP Monitoring

Collaboration

- What nurses know:
 - The MAP formula is $2 \times \text{diastolic} + \text{systolic} / 3$
- What engineers know:
 - It's more complicated than that



Updating Monitors Housewide

- Clinical Technology: Identified the need and obtained funding for multiyear project to replace monitors housewide.

Dept	Classification	Tele	Total Patient Monitors	VS30	
2W	1	Y	9	4	
4E	1	N	3	1	
4W	2	Y	6	2	
5E	1	Y	0	9	
5W	1	Y	8	1	
6E	1	N	0	7	
6W	2	Y	3	5	
St25	2	N	0	0	
St31	1	Y	5	0	
St35	2	N	2	4	
St41	3	N	0	3	
St45	2	Y	3	5	
Total			39	41	

Legend		
Classification:		
1 - high acuity		
2 - moderate acuity		
3 - low acuity		
Proposed future VS30s:		
1 per 8 patients		
Proposed future MX450s:		
Tele & class 1 - 2 per 8 patients		
Tele & class 2 - 1 per 8 patients		
Non tele - 0		

<https://nurseengineer.com/>

NURSES & ENGINEERS

An initiative to unite interdisciplinary professionals to foster collaborations between nursing and engineering

GOALS OF THE INITIATIVE

- o Promote, foster and enable partnerships between nurses and engineers as they seek to improve healthcare
- o Improve working conditions for nurses and support nursing practice
 - Ensure devices and technology enable nursing practice and allow patients to benefit from the nurse-patient relationship
 - Find ways engineers can assist nurses in their work

Articles of Interest

[Calls to Unite Nursing and Engineering](#)

Kester KM, Hatton J, Kelly J, Carroll M, Lindsay M, Jordan N, Fuchs MA, Patel MR, Engel J, Granger B. Moving nursing innovation to prime time through the use of creative partnerships. Nurs Outlook. 2022 Nov-Dec;70(6):820-826. doi: 10.1016/j.outlook.2022.07.002. Epub 2022 Sep 22. PMID: 36154773. [\[PubMed\]](#)

Zhou Y, Li Z, Li Y. Interdisciplinary collaboration between nursing and engineering in health care: A scoping review. Int J Nurs Stud. 2021 May;117:103900. doi: 10.1016/j.ijnurstu.2021.103900. Epub 2021 Feb 7. PMID: 33677250. [\[PubMed\]](#)

Nurs Outlook. 1986 Jul-Aug;34(4):196-8. Needed: nurse engineers to link theory and practice. Harrell JS. [\[PubMed\]](#)

Thank You

Any question?

Please type your questions to the Zoom Q&A window

Please complete the online evaluation form at
<https://www.surveymonkey.com/r/ACCE2025-session10>



Complete this survey to help us select topics for the 2025-2026 webinar series:



<https://www.surveymonkey.com/r/2025-2026Topics>