

# AAMI2016

Conference & Expo  
June 3–6, Tampa, FL

The premier industry event  
for healthcare technology  
management professionals

Clinical Engineers and Biomedical Engineers in Japan and the U.S

Environment of medical device development, role of biomedical  
department toward to develop new medical equipment

June 5 | 10:00 AM

**Tamotsu Tsunekage**  
**Sr. Biomedical Engineer**  
**Westchester Medical Center**

# MAJOR DIFFERENCES

- **Direct involvement of patient care (Japan)**
- **Must have government certification (Japan)**
- **Background education, job requirement**
- **Daily task, duty & activities**
- **Salary, pay**

# ADVANTAGE/DISADVANTAGE

(JAPAN)

- KNOWS EQUIPMENT AS A USER – EASY TO IDENTIFY THE PROBLEM
- CAN FOLLOW PATIENT ONE UNIT TO OTHER UNIT – KNOW PATIENT CONDITION
- RESPECT FOR MEDICAL EQUIPMENT
- *LESS TIME FOR MEDICAL EQUIPMENT MANAGEMENT*
- *NOT ENOUGH BACKGROUND FOR TECHNOLOGY ASSESSMENT*

# JAPAN

**The qualification of CE, incorporating both engineering and medicine, was first established in 1987. The CE is a health care professional who ensures the safety and effectiveness of medical equipment.**



## A basic duties guideline for CEs devised in 2010

The main duties of the CE are classified as **respiratory therapy, cardiopulmonary bypass, dialysis units, intensive care units, cardiac catheterization, hyperbaric oxygen therapy, pacemakers** and medical equipment management.

To enhance the ability of CEs to engage in more extensive duties and develop specialties, there is a certification system in each field. The CE plays a role that is socially important by ensuring the safety of medical equipment and its effective maintenance.

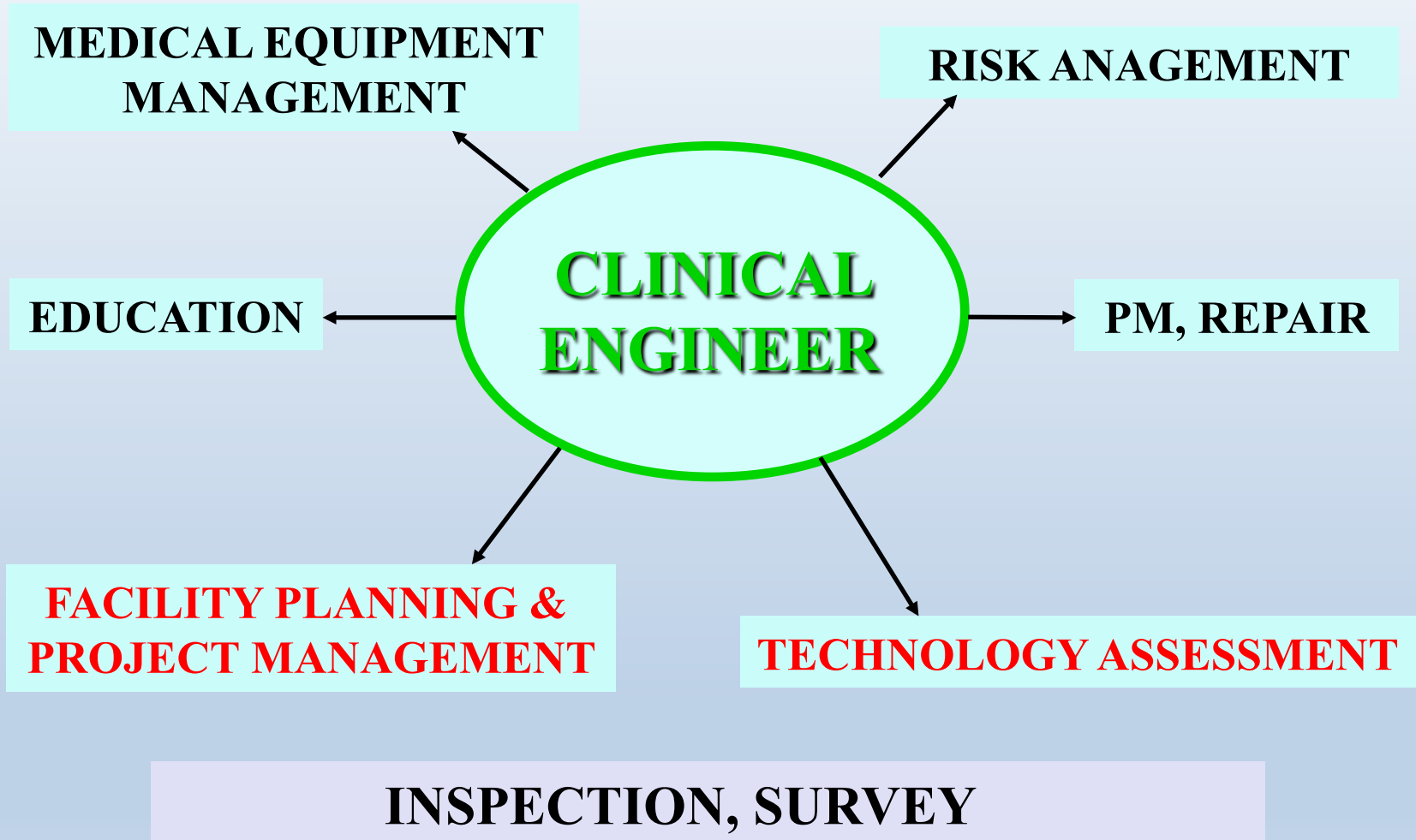
# USA

- Respiratory Therapist (RT)
- Perfusionist
- Dialysis Technician
- Asset Managers
- Hospital IT Specialists
- Other Healthcare Technology Management Professionals
- Etc. Task is separated by Certificate

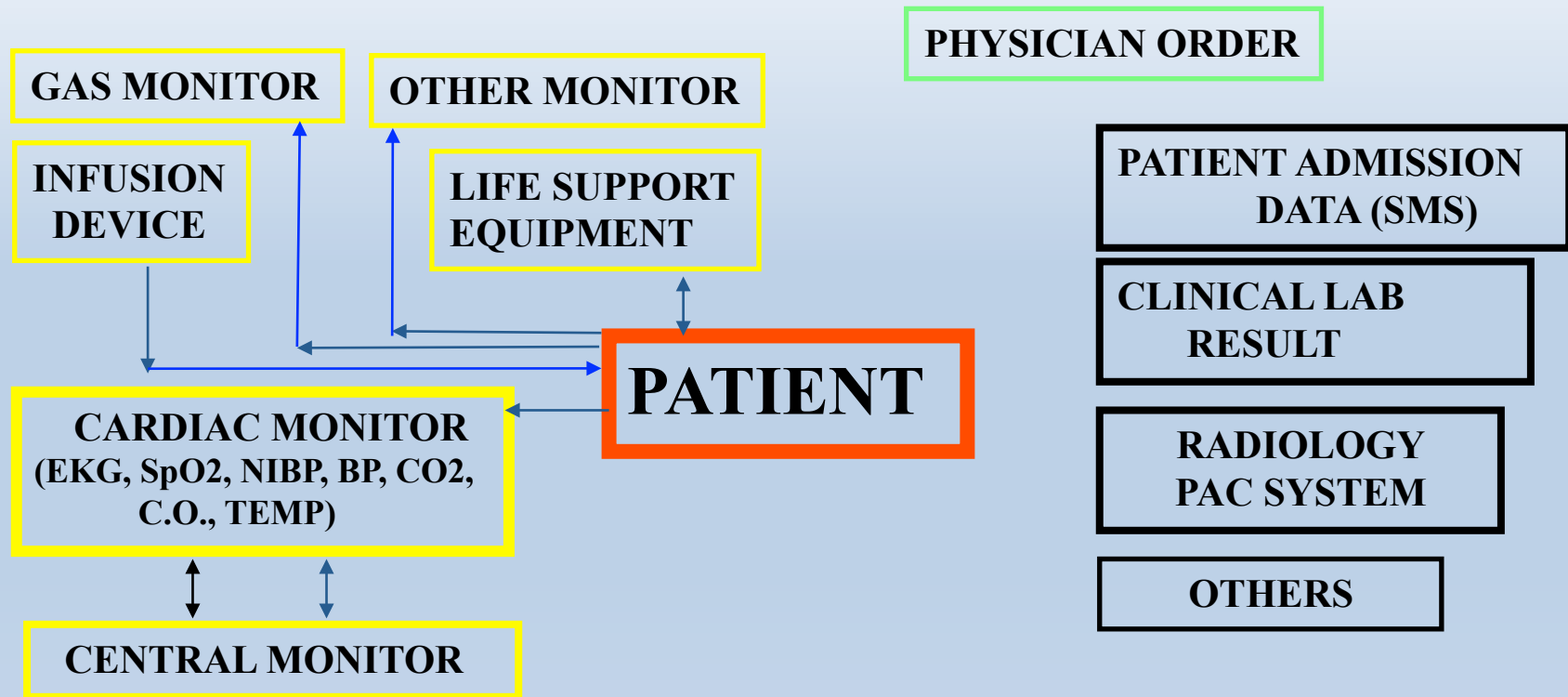
# Vision Statement

**Biomedical Engineering makes an effort so that the patient care is economical and more effective by offering services of the highest level to users so that equipment may be technically and safely operated.**

# TASK OF CLINICAL ENGINEERING DEPARTMENT IN USA



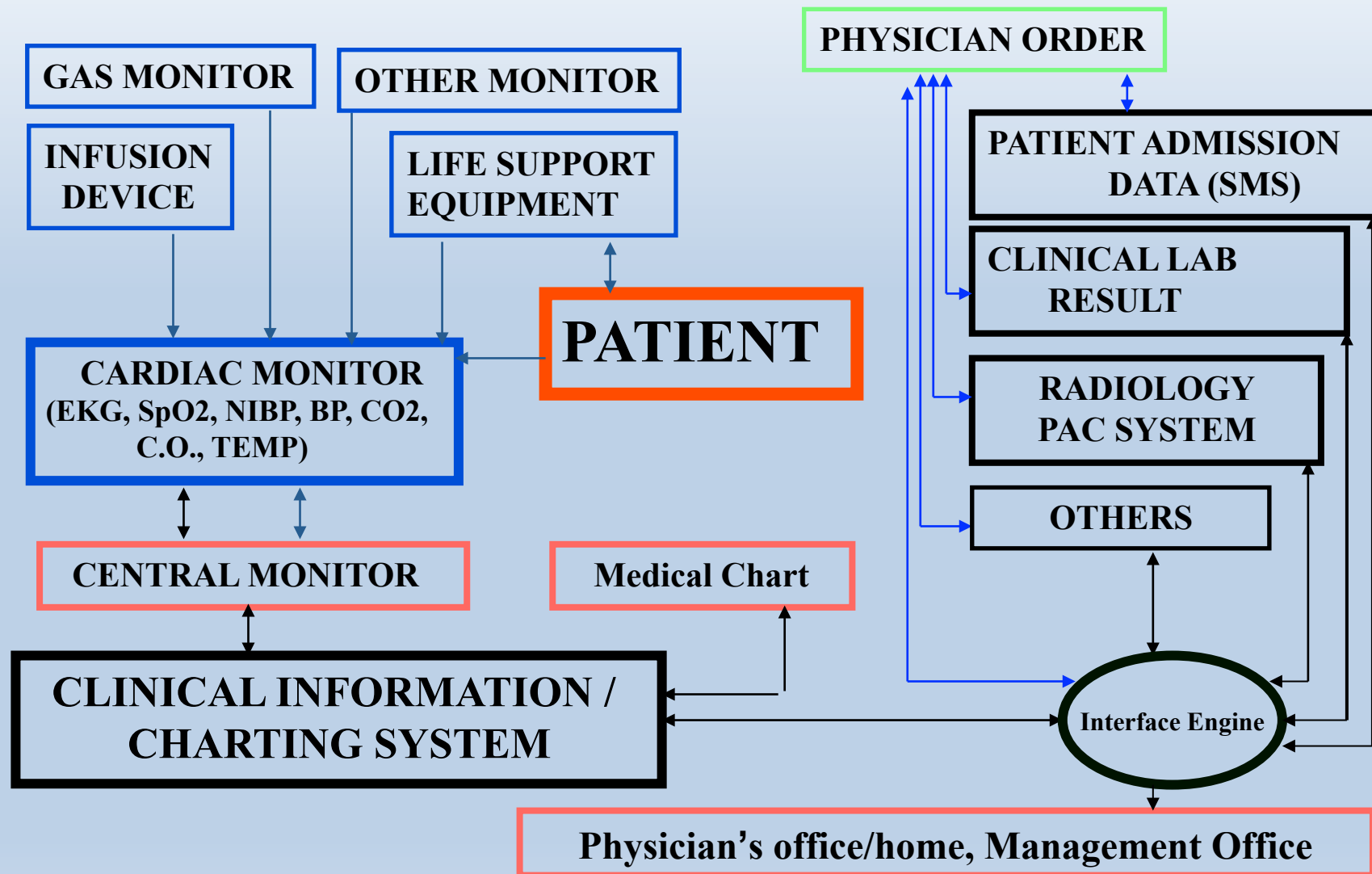
# POINT OF CARE



# WMC Biomed Involvement

- Developed interface program between monitor & Ventilator, blood gas analyzer, infusion pump (1993) – Exhibited at PGA
- Infusion pump drug simulation for Anesthesiologist (1994)
- Interface between hospital information system, clinical lab system & physiological monitoring system (1995)
- Display PAC image at bedside monitor(1998)
- Design transport incubator for helicopter

# POINT OF CARE

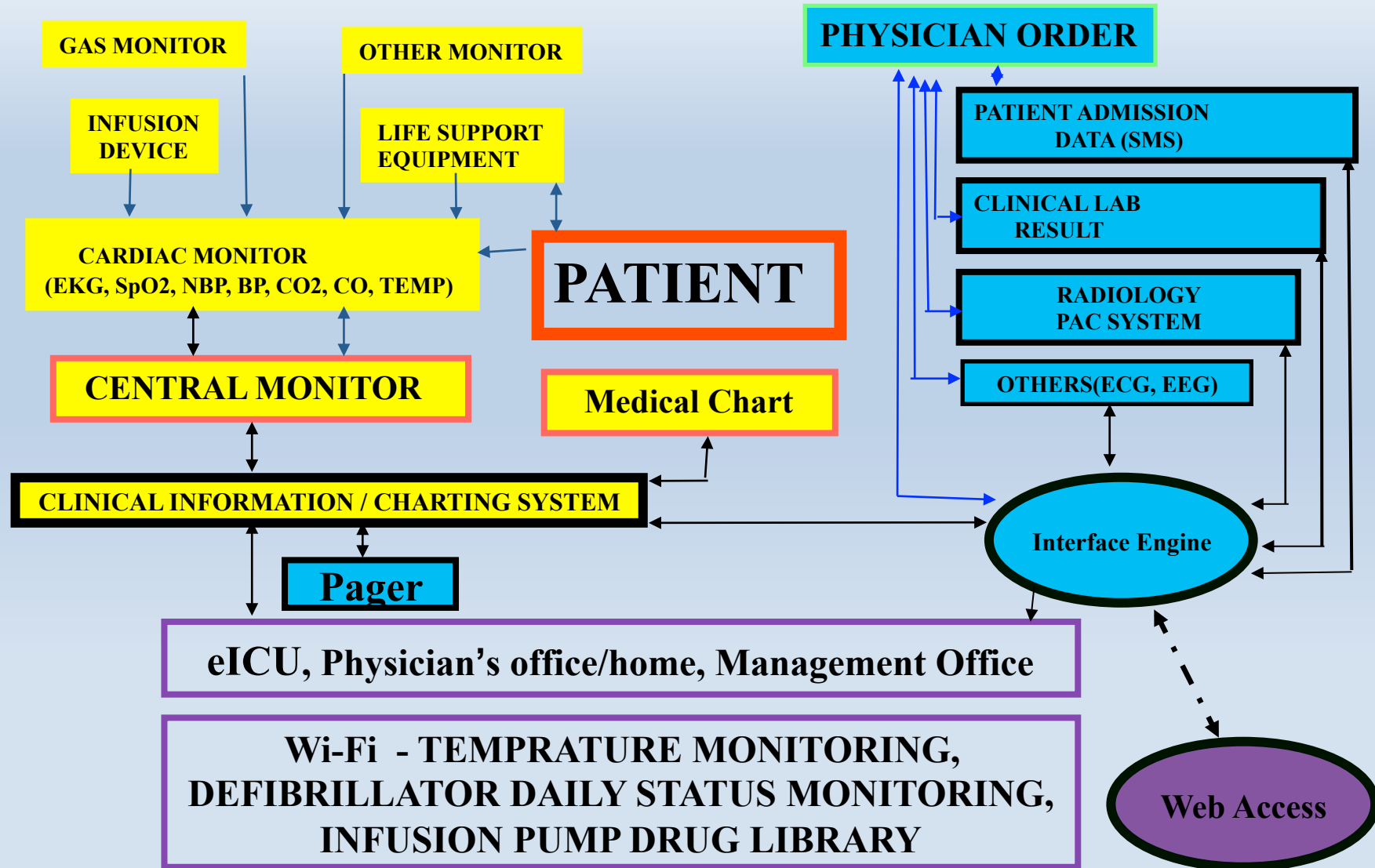


# WMC Biomed Involvement in medical device development

- Concept – Point of care
- Safety oriented idea
- Provide best tool to care givers
- Reduce human error
- Increase readiness of equipment
- Monitor environment to ensure the product, performance



# POINT OF CARE



# TECHNOLOGY ASSESSMENT

- ▶ **Defibrillator Auto test monitoring – Wi-Fi**
- ▶ **Refrigerator Temp/Room Temp/CO2/  
Humidity/etc. real time monitoring – Wi-Fi**
- ▶ **eICU – LAN/Web**
- ▶ **Infusion Pump Drug Library – Wi-Fi/Web**

# Biomedical Technician I

## Job Description

Provide technical knowledge and the ability to test, repair and maintain medical devices. Equipment includes electronic test equipment and various types of medical equipment. Testing will be done in our facility and will involve staff interaction.

# Biomedical Technician II

## Job Description

The Biomedical Tech II works independently on preventive maintenance, safety inspections and will make repairs on moderately sophisticated clinical medical equipment with little or no supervision and will make repairs on highly sophisticated clinical medical equipment under the supervision of a BMET Supervisor. Maintains records, makes reports, and coordinates outside repairs.

# Biomedical Technician II

## Position Requirement

Associates degree in biomedical instrumentation technology, biomedical equipment technology, biomedical engineering technology, electronics

or  
related field, plus 5 years' experience in a healthcare environment repairing patient related equipment, and eligible for certification as a CBET, CLES, or CRES by AAMI  
(Association for the Advancement of Medical Instrumentation)

or  
a High School Diploma, plus seven 7 years' experience in a healthcare environment repairing patient related equipment and eligible for certification as a CBET, CLES, or CRES by AAMI.

# Biomedical Technician III

## Job Description

The Biomedical Equipment Technician III will perform highly skilled work and preventive maintenance of considerable difficulty on very sophisticated clinical equipment with minimal supervision. The Technician III will perform repairs on all facets of medical, diagnostic and therapeutic equipment and perform scheduled preventive maintenance and electrical safety inspections on medical, diagnostic and therapeutic equipment used in the treatment of patients at -----.

# Biomedical Technician III

## Position Requirement

Associate's degree in Biomedical Instrumentation Technology, Biomedical Equipment Technology, Biomedical Engineering Technology Electronics or related field plus 4 years preventive maintenance experience, plus certification as a CBET, CLES, or CRES by AAMI (Association for the Advancement of Medical Instrumentation)

or

# Biomedical Technician III Position Requirement

Equivalent Military Training, plus 4 years experience working in a hospital or other healthcare environment performing preventive maintenance, plus certification as a CBET, CLES, or CRES by AAMI (Association for the Advancement of Medical Instrumentation)

or



# Biomedical Technician III

## Position Requirement

High school diploma/GED plus 6 years experience working in a hospital or other healthcare environment performing preventive maintenance, plus certification as a CBET, CLES, or CRES by AAMI (Association for the Advancement of Medical Instrumentation)

# Education Requirements to BMET in US

Although prospective candidates with a high school diploma may be able to secure an entry-level job, those who have completed an associate's degree program in biomedical technology or biomedical engineering may have an easier time finding employment and may begin with a higher pay level. Coursework in an associate's degree program for this major consists of classroom lectures that focus on electronics and equipment troubleshooting. Students also complete hands-on laboratory work on equipment repair and preventative maintenance.

# NY State CSEA

(35 Hours per week)

- **Biomedical Technician (C09)**  
**\$47,163 - \$66,641**
- **Sr. Biomedical Technician (C10)**  
**\$52,102 - \$73,439**
- **Biomedical Engineer (C12)**  
**\$61,878 - \$93,483**
- **Sr. Engineer (Biomedical) (C13)**  
**\$68,574 - \$102,634**

# US

- Clinical Engineer (CE) : Salary \$ 80,000 ~ 120,000
- Biomedical Engineer (BME) : Salary \$ 54,000 ~ 98,000
- Biomedical Equipment Technician (BMET) : Salary \$ 45,000 ~ 58,000

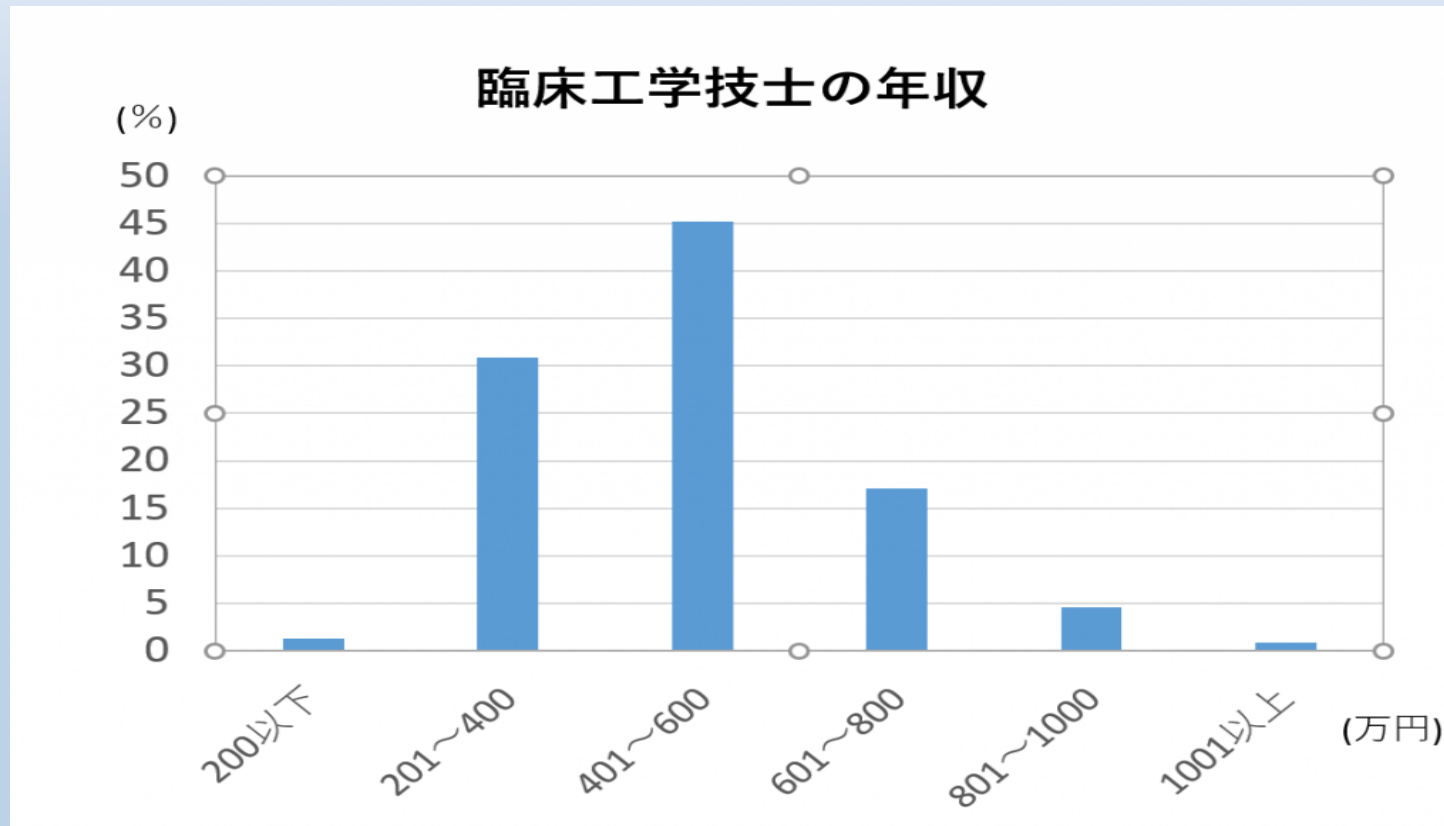
# US

Clinical Engineer average salary is \$70,193, median salary is \$69,784 with a salary range from \$48,415 to \$109,637.

Clinical Engineer salaries are collected from government agencies and companies.

Low	48,415
Average	70,193
<b>Median</b>	<b>69,784</b>
High	109,637

# Japan



**\$37,130 – \$55,556**

**20<sup>th</sup> 25.7%、30<sup>th</sup> 40.5%、40<sup>th</sup> 19.7%、50<sup>th</sup> 12.3%**

(日本臨床工学技士会誌2015No.55P28より引用) \$ = 108 Yen

# **Thank You**

## **Tamotsu Tsunekage**

# Transforming Healthcare



## NEW 11 BED MICU







Phase 1



Phase II

## Labor and Delivery Expansion and renovation



Phase III



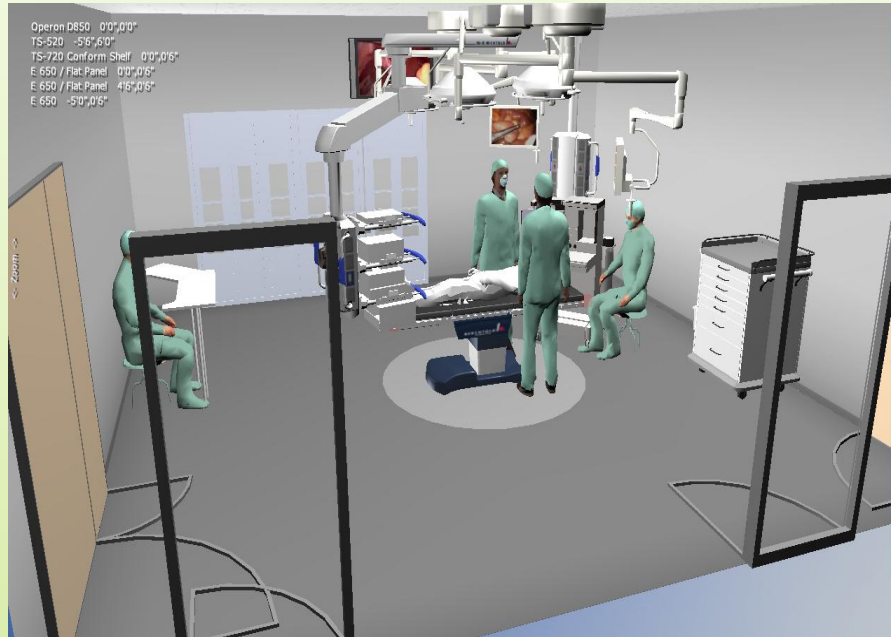
Phase IV



# Special Procedure Labs



# MFCH OR /Procedure Room #1



Concept



To

Reality



# Infrastructure Wiring & Networking



# Patient Monitoring





# Technology- Continuation of Transformation

## Operating Room-Audio / Visual Integration



# Technology- Continuation of Transformation

## Infant Transport System / Internal / external





# Thank You

## Tamotsu Tsunekage

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