Involvement of CEs to the IoT in Healthcare

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Agenda

- Japanese Clinical Engineering System

- EMR

- Telemedicine

Japanese Clinical Engineering System

Clinical Engineers : Japan

- Clinical Engineer License System
  Established in 1987
  National License

- Education

  4 years education in university
    or
  3 years education at a polytechnic college

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The Facts

Operating Equipment in the Clinical Environment   40%

- Respiratory therapy
- Perfusion (HEART-LUNG machine)
- Dialysis (Dialysis equipment)
- Operative treatment (Surgical equipment)
- Intensive care units
- Cardiac catheterization
- Catheter abrasion for arrhythmias
- Hyperbaric oxygen therapy
- Other treatment (defibrillators)
- Pacemaker, ICD, CRT

Service Delivery Management   20%

Patient Safety   20%

Healthcare Technology Management (HTM)   20%

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Our Clinical Fields *(a case of Aso Iizuka Hospital)*
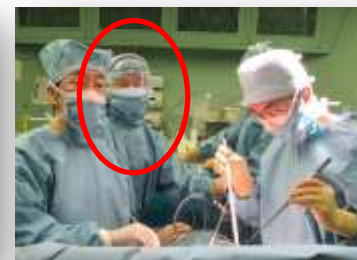

HTM

Haemodialysis

Operation Room

Operation Assistance

Perfusion

Intensive Care

Cardiac Catheter
(intervention)

Hyperbaric Oxygen Therapy

Endoscopy

Capsule Endoscopy
(Interpretation)
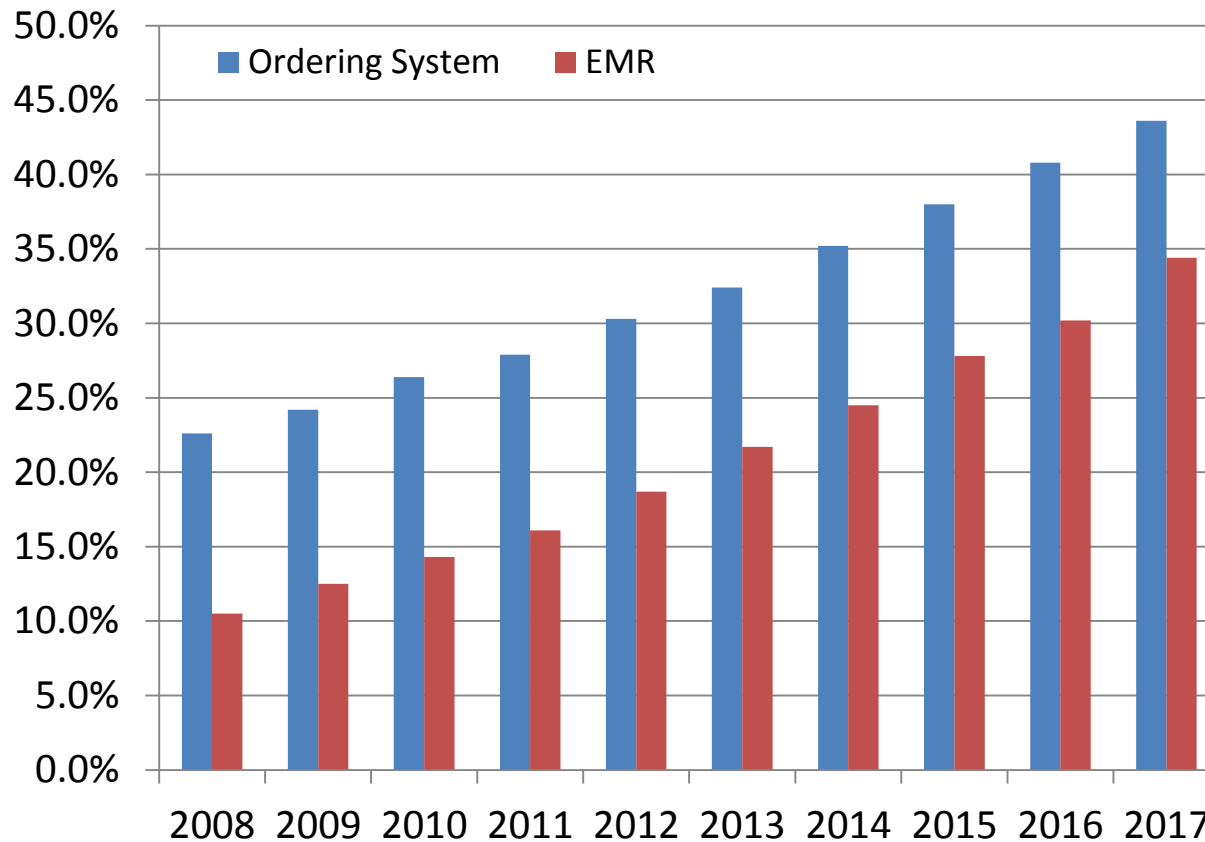
Pacemaker Clinic

Staff Education

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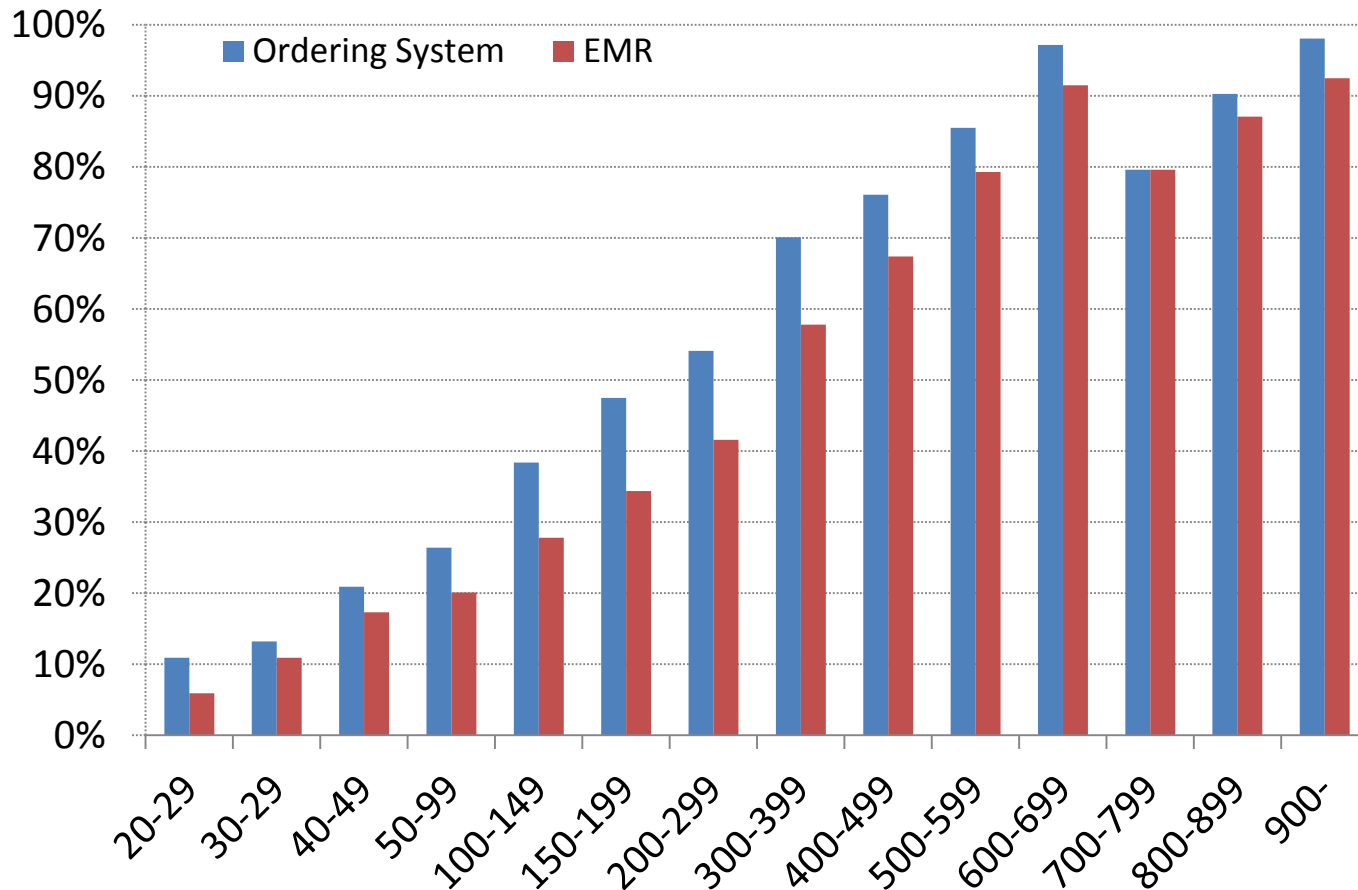ASO IIZUKA
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EMR
(Electric Medical Record)

Penetration Rate of EMR

Data from :"Installed Condition Survey of Medical Information System"
Japanese Association of Healthcare Information Systems Industry

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Penetration Rate of EMR

Data from :"Installed Condition Survey of Medical Information System"
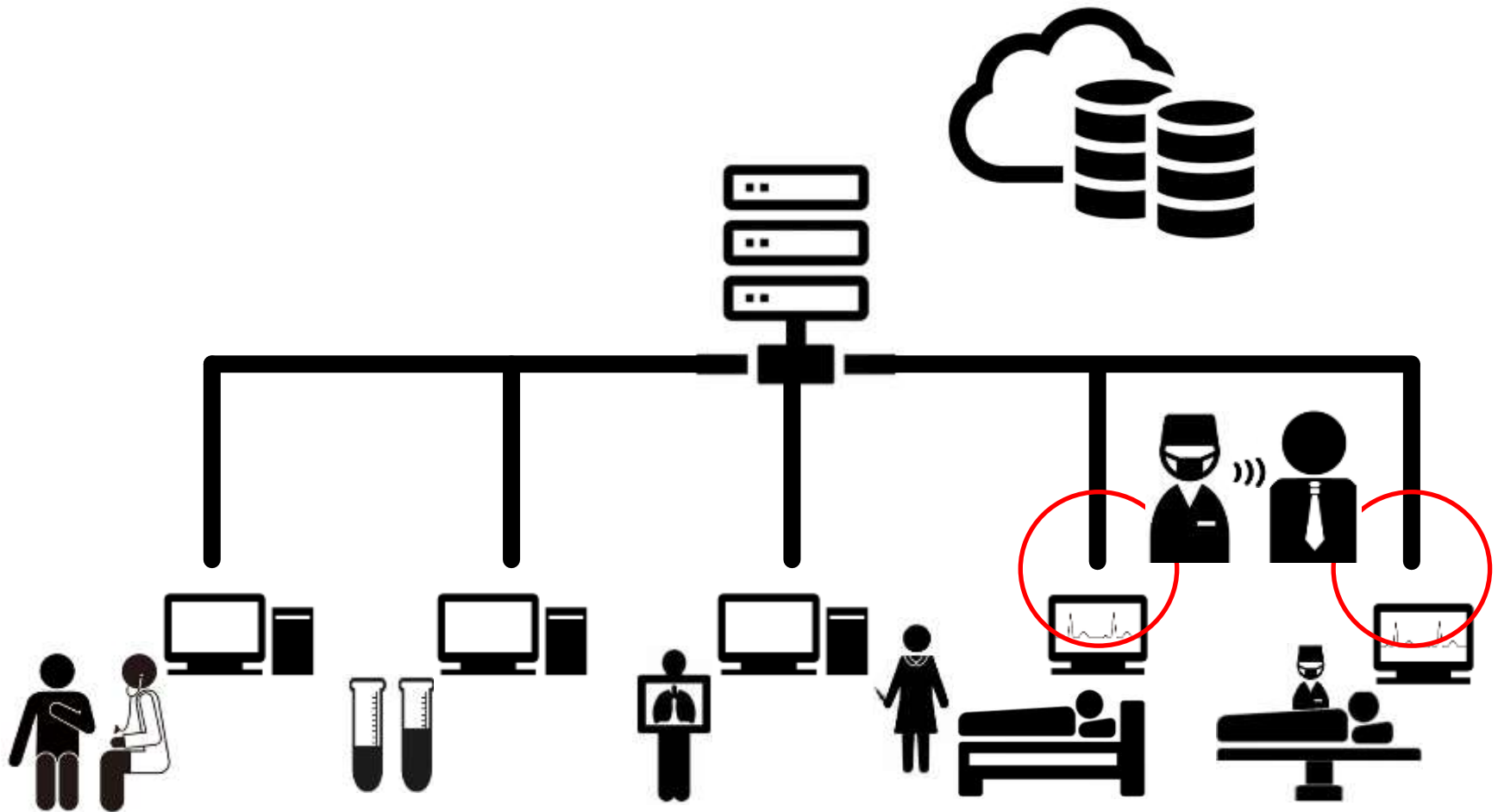Japanese Association of Healthcare Information Systems Industry

EMR and Manpower

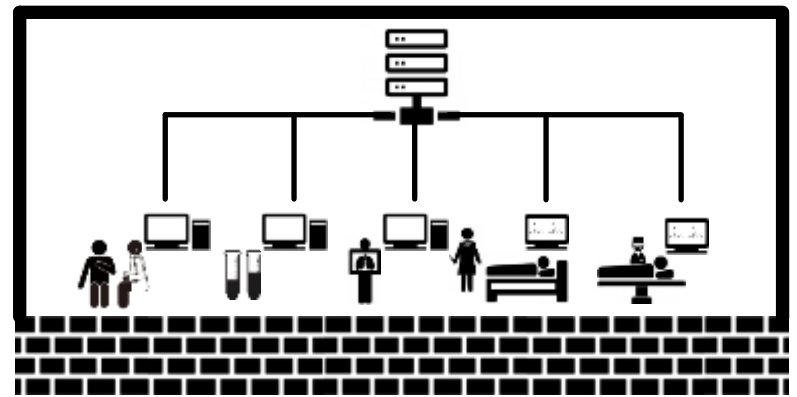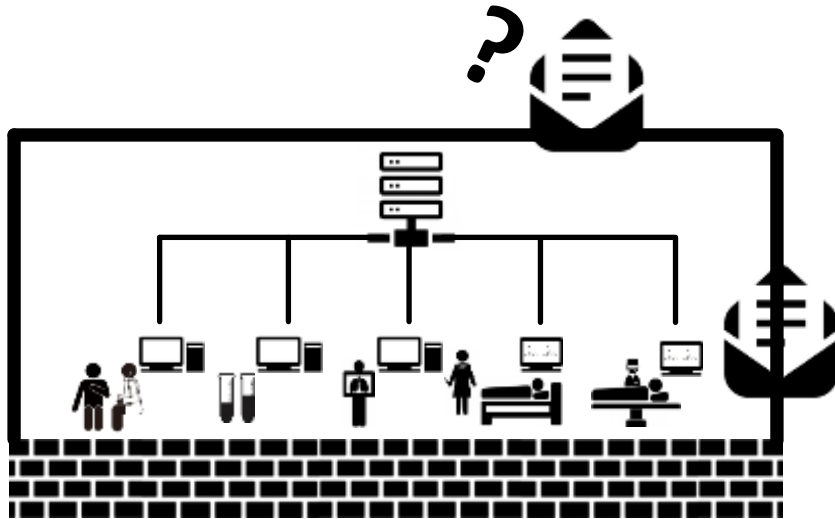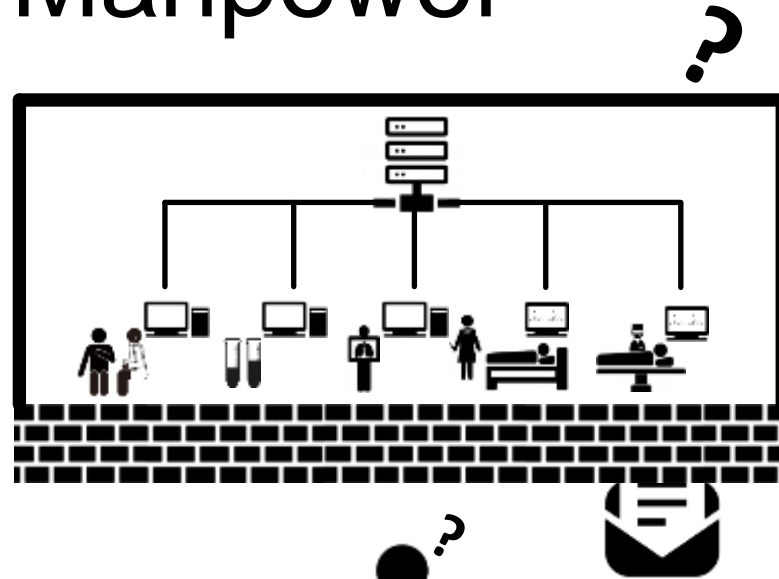|	201-500 (n=10)	501-800 (n=7)	801- (n=5)
No. of PC	690	831	2085
No. of SE	4.4	10.0	15.4
No. of PC/bed	1.8	1.5	2.1
No. of PC/SE	159.7	100.0	161.3
Vendor Staff stationed	0.0%	14.3%	60.0%

CEs usually do not take care of EMR and IT system

EMR and Network

EMR and Manpower

EMR

- In-house Record
    Patients cannot see their medical record
    Other institutions can see their original medical record only
    No common system for EMR (very limited)
    Private-sector initiative

- Cloud service in healthcare is not common for hospitals
    No clear official guidelines from the government

- Duplication of medical examinations and prescription
    e.g.) Waste of leftover medicine cost could be 500 million USD a year
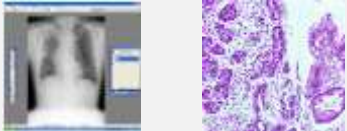
Telemedicine

Background of Promoting Telemedicine

- Escalation of medical costs (about 400 billion USD a year)
    Promoting an integrated community care system
        Clarification of the roles of hospitals
        Shifting to Home-care

- Shortage of medical professions especially physicians

- Aging society
    Decreasing of mobility
    Caring of the elderly by the elderly

Reimbursement on Telemedicine

	Types of telemedicine	Reimbursement

D to D
(Doctor to Doctor)
	Consulting with specialists using IT devices
	(e.g. Image transmission-reception)
		On-line image diagnosis fee
		On-line pathological diagnosis fee
		  for rapid diagnosis during surgery
		  for pathological image diagnosis

D to P (Doctor to Patient)	On-line Consultation	On-line consultation fee **7 USD** On-line patient management fee **10 USD** On-line home medical care fee **10 USD**

	Remote Monitoring	**CIEDs remote monitoring fee**
		Remote monitoring fee
		  for home oxygen management **15 USD**
		  for home respirator management **15 USD**

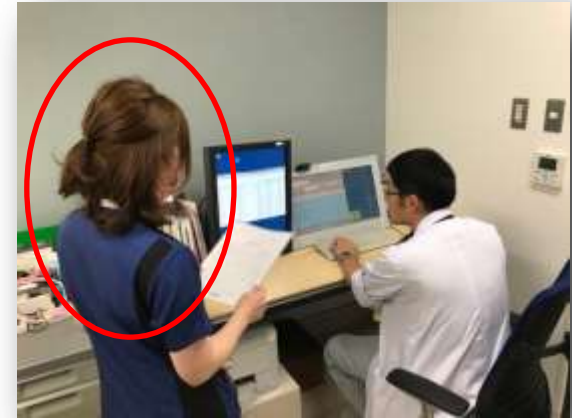From : website of Japanese Ministry of Health, Labour and Welfare

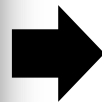# Remote monitoring of CIEDs
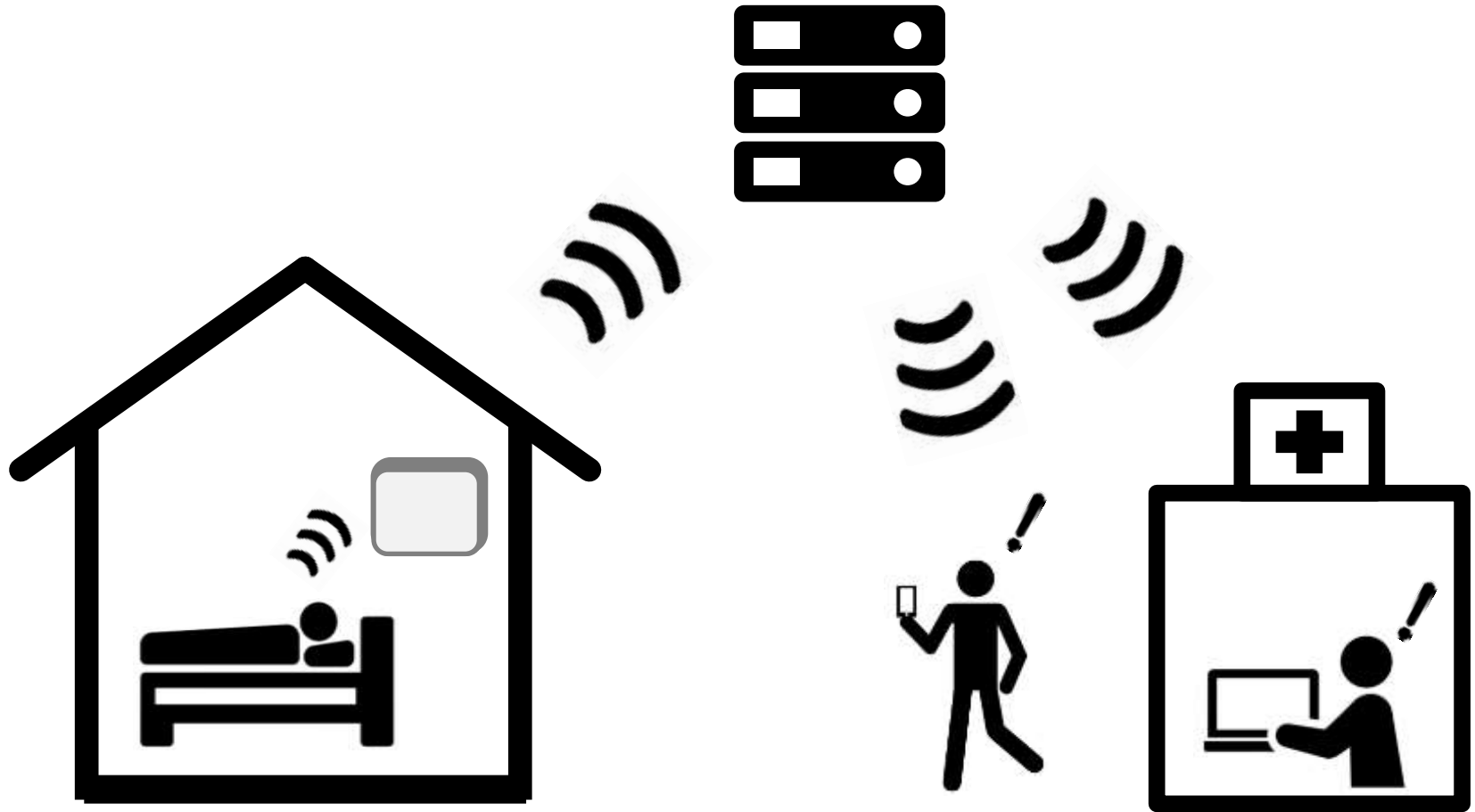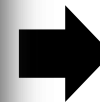
Roles of CEs in CIEDs management

Implantation

CIEDs Clinic

Patient Education

Remote Monitoring

Reporting to physician

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Roles of CEs in Remote Monitoring

- Escalation of medical costs

  Promoting an integrated community care system
  Clarification of the roles of hospitals
  Shifting to Home-care

  Providing reports of conditions and/or remarkable events obtained by the remote monitoring system to local physicians

- Shortage of medical professions especially physicians

  Reducing the time of consultation without reducing face to face time by pre-analysing of data and/or arrhythmia ECGs

- Aging society

  Decreasing of mobility
  Caring elderly by the elderly

  Reducing the number of hospital visits

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Potential of Telemedicine

- ## Prevention Medicine

  Mobility and activity recording

  DM management

  Nutritional management

  Sleep monitoring

  Asthma attack prediction

- ## Home Visit

  Device monitoring and reporting system

  (e.g. ventilator, home oxygen therapy, vital sign monitor)

  Automatic care report creation system

  Route planning system

  On-line consultation service for medical professions and/or patients

  On-line interpretation service

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Conclusion

- Japanese CEs practicing in the clinical fields

- EMR system isn't open to the patients and other medical institutes

- CEs are not involved in EMR and IT systems much

- Telemedicine is being strengthened through the reimbursement system

- CIEDs management is one of the telemedicine fields where CEs can play the main role

- Rate of reimbursement for telemedicine is not high

- Many types of IoT healthcare devices will be available in the clinical fields soon

- JACE needs to consider cultivating human resources for IT expert CEs.

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Thank you for your attention

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