

# Medical ICT in Japan

A pivot of the Growth Strategy of the Abe government

Rapid advances through the adoption of  
“My Number” and Regional Health Information Network

Hiroshi Tanaka, Prof., Ph. D, Dr. Med

Tokyo Medical & Dental University

Tohoku University

# Today's topics

- **History and evolution of Medical ICT in Japan**
- **Current Rapid Dissemination of Regional Medical Information Cooperation in Japan**
- **Promotion of Medical ICT in Japan**  
**Revitalization Japan Strategy : A pivot of**  
**“ Growth Strategy” of the Abe government**  
**(“Abenomics”)**
- **Next generation Medical ICT: Big data**  
**Genome/Omics medicine, and Mobile health**

# History and Evolution of Medical ICT in Japan

Adoption of ICT in Healthcare was relatively early in Japan

For a long period (1970s-2000s), Medical ICT has been developed and primarily for administration and medical practice within the hospital.

1<sup>st</sup> generation: **Departmental system** :1970s -

financing (accounting) system, departmental computerized system of clinical laboratory or pharmacy



accounting Laboratory system

2<sup>nd</sup> generation: **CPOE** (Computerized Physician Order Entry): 1980s-

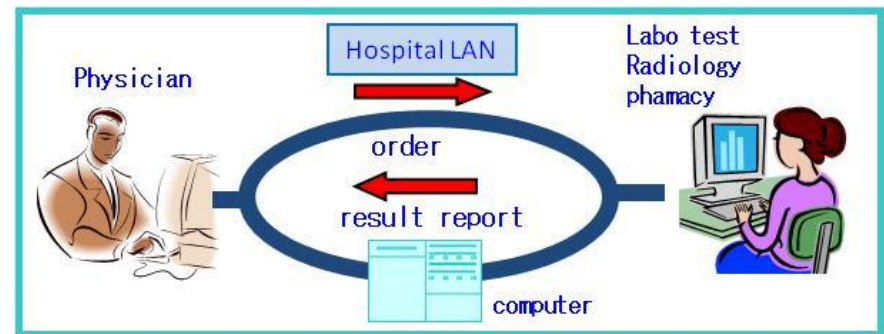
Order-entry/result reporting system of laboratory or radiological test, drug prescription

3<sup>rd</sup> generation: **EMR** : 2000s-

(Electronic Medical Record)

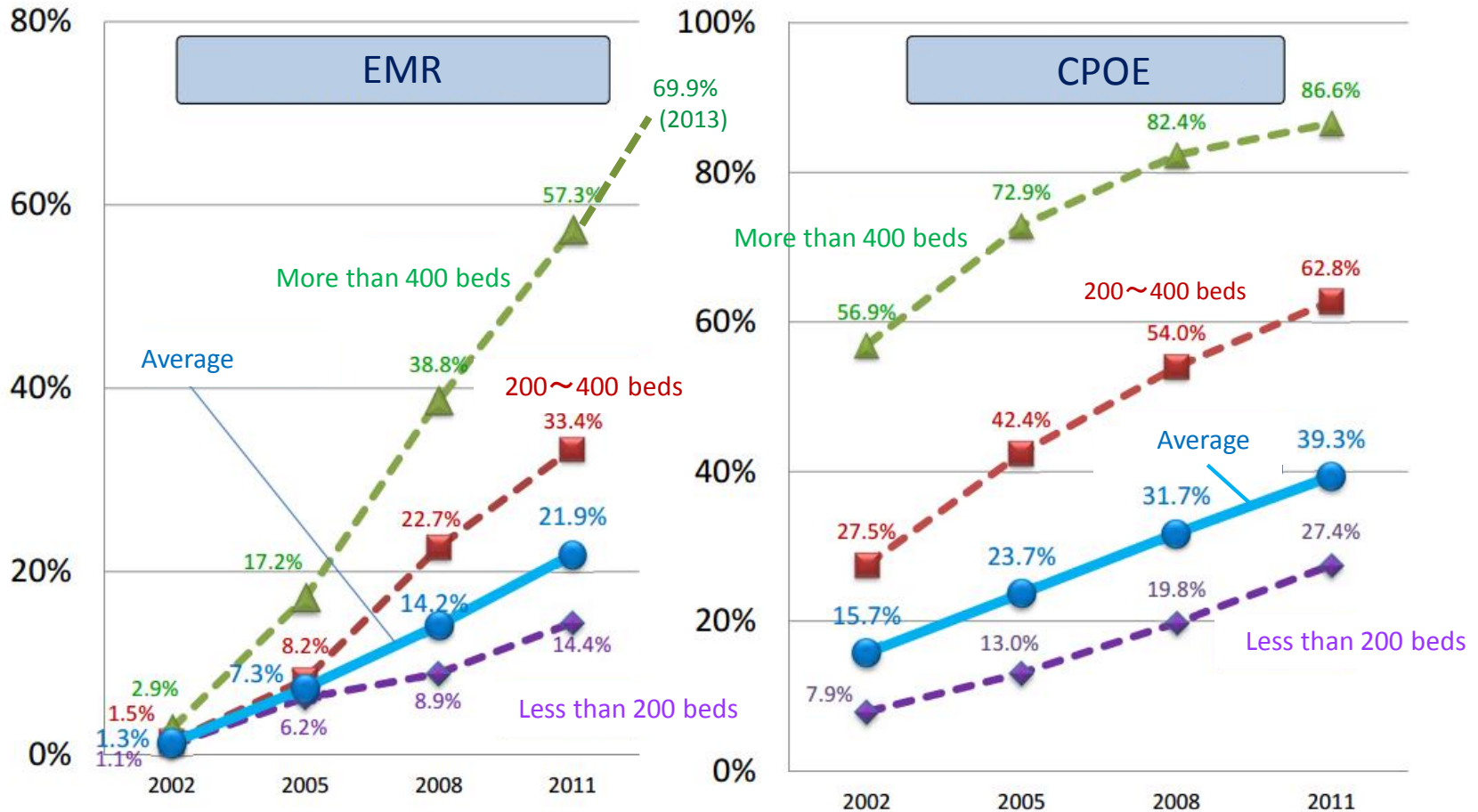


Display Screen of EMR



Concept of CPOE

# Adoption rate of EMR in Japan



In opening a new clinic, **70-80%** of them adopts EMR

# Current Situation of EMR adoption

- Large-scale hospitals (>400 beds: 827 hospitals)  
⇒ High adoption of EMR ≐ 70%,
- Small-scale hospitals (<200 beds: 5908 hospitals) Total number 8540 (about 2/3)  
⇒ Low adoption of EMR < 14%, but many  
Majority of Japanese hospitals are private and of this class
- Clinics : Total rate of EMR adoption is low (≐ 30%)  
⇒ For clinics newly opened, 70-80% of them adopts EMR, specially in urban area almost 100%

## Reason for retardation in small-scale hospital

Remuneration of medical service (universal health insurance) does not covers adoption of EMR

Most of small-scale hospitals are financially struggling.

- Small scale hospital can not afford the initial cost of EMR (60 thousands for my bedz)
- The class of hospitals considerably lowers the average adoption rate of EMR in Japan
- However, in this class of hospital, the effects of adoption of EMR are “remarkable” and brings fairly big economical effects.

They are now adopting EMR to meet the trend of increase in regional health information network

# New Stage of Medical ICT (4<sup>th</sup> generation)

## Crisis of Japan Regional Medical Care (2005~)

### 1961 Universal Insurance

Economy  
Rapid growth  
1955~1972  
Stable growth  
1973~1990

support



Japanese styled medicine  
Medical Care Complete  
within Hospital

Expansion Policy  
1961~1982  
Reduction Policy  
1983~

### 1991 bubble burst

Zero growth  
1991~

cause



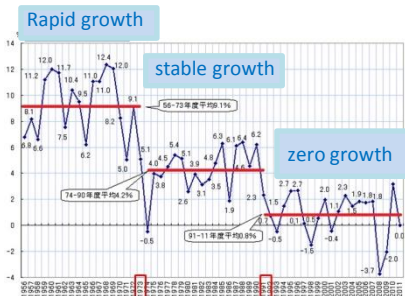
1. Severe Reduction of Healthcare budget by Koizumi Cabin
2. Shortage of physicians due to the new residency program system

2005~

Rapid aging

Recovery of Japan Medical Care

Go beyond the hospital



# Measures and Dissemination of Regional Medical Information Cooperation Network

## Fund for Recovery of Regional Medical Care

**MHLW:** Rebuilding of the regional medical care system

### 1<sup>st</sup> fund: Revised supplementary budget (fiscal 2009)

235 B yen; 2.5 B yen X94: 2 regions for each pref. until 2005

### 2<sup>nd</sup> fund: Revised supplementary budget (fiscal 2010)

210 B yen : 1.5 B yen X52 ( whole pref.+ 6 for Hokkaido) until 2005

### 3<sup>rd</sup> (2011), 4<sup>th</sup> (2012), 5<sup>th</sup> (2013) supplementary budget

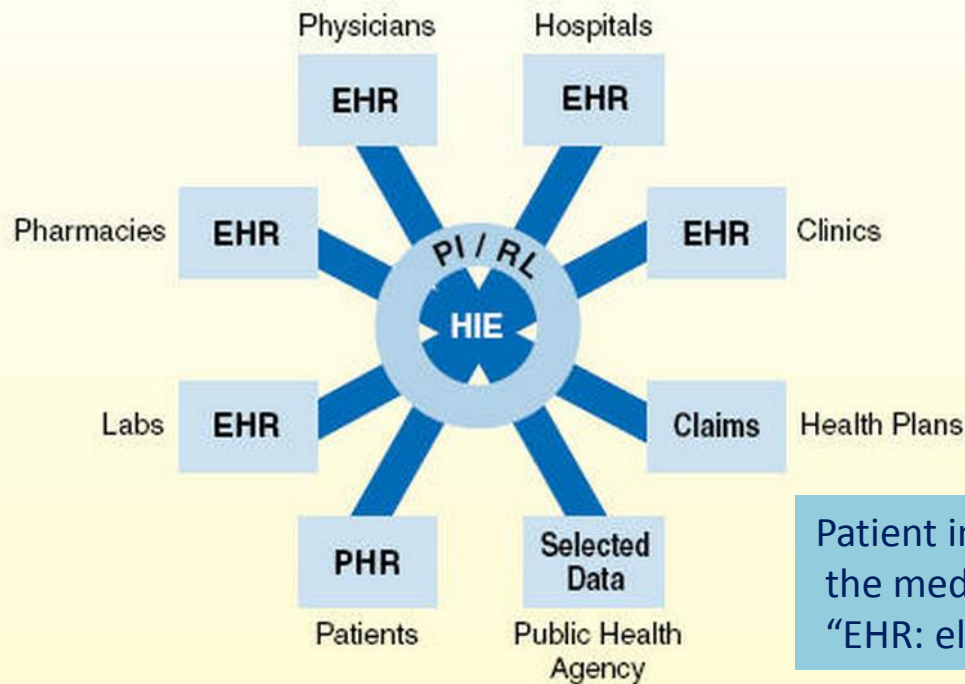
For recovery of damaged medical systems in the disaster area  
Great East Japan Earthquake (Fukushima, Miyagi, Iwate)

These funds were used for mainly facilities and equipments  
But, gradually they become used for **development of Regional  
Medical Information Network**



# Regional Medical Information Network (4<sup>th</sup> generation of Medical ICT)

Concept of regional medical information cooperation system



**EHR** - Electronic health record. Data is stored at each provider location, not in a central location.

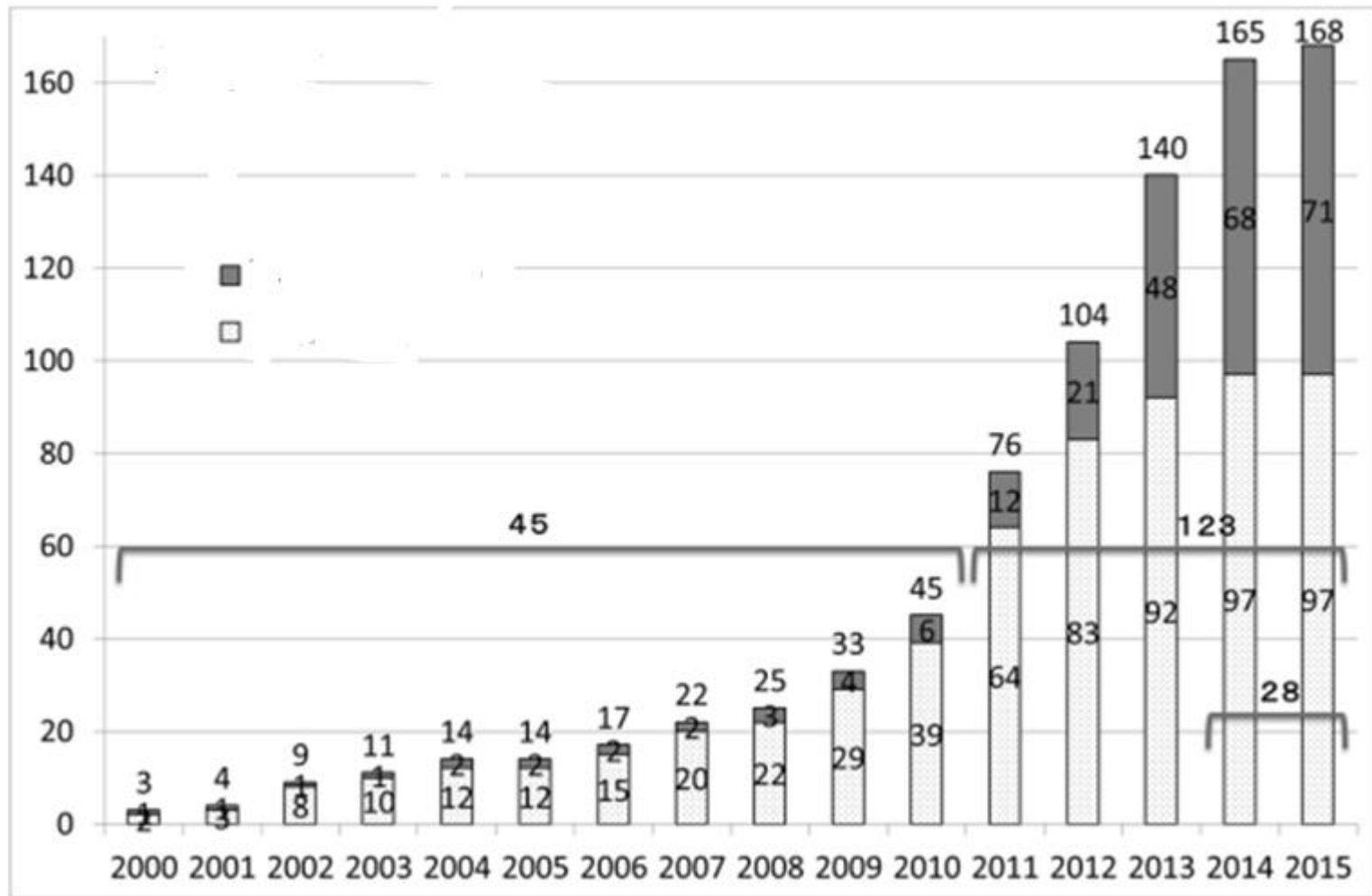
**PHR** - Personal health record. Enables individuals to access their health records.

**PI/RL** - "Patent Index" and "Record Locator" software. These tools guide data requests through the network to the relevant information about the correct patient.

**HIE** - Health information exchange network. Information technology structure that enables health data transfer.



# The Effect of Fund for Recovery of Regional Medical Care



Since introduction of the fund for recovery of regional medical care (2010.1), number of regional medical care information system has increased fourfold

# Integration of Regional Medical Information Cooperation Networks


- **“Common ID for medical use” for all the people in Japan**

– Patient Medical information would be **integrated laterally** through the country by communicating various sources among the different regional healthcare systems by using **national ID**

- **Minimum sets of patient healthcare information sharing**

– Minimum set of medical information is defined so that at least these information can be shared inter-regionally, making **National-wide EHR**

Minimum dataset (example)



items	inter-medical institutes	hospital ↔ nursing home	emergency care
<b>【basic information】</b>			
names	○	○	○
birth date	○	○	○
common ID	○	○	○
gender	○	○	○
blood type	○	○	○
address	○	○	○
Tel number	○	○	○
disease	○	○	○
disease	○	○	○
regularly used medicine	○	○	○
allergy	○	○	○
infectious disease	○	○	○
clinics regularly visiting	○	○	○
summary	○	○	○
<b>【physical measurement】</b>			
height	○	○	
weight	○	○	
temperature	○	○	
pulse	○	○	
pressure (systolic/diastolic)	○	○	
<b>【labo-test】</b>			
blood count(red/white blood cell, Ht, Hb)	○		
serum cholesterol(total, HDL, LDL, TG)	○		
liver function(AST, ALT, YGPT)	○		
kidney function(BUN, Cr)	○		
urine(protein, occult blood)	○		
glucose tolerance(glucose, HbA1c)	○		
ECG	○		
<b>【ADL】</b>			
nursing	○	○	
diet	○	○	
excretion	○	○	
bathing	○	○	

# “My Number” (social security and tax number) system will start from next year

They will promote the Medical ICT and regional health information system

**Each resident will be notified of his or her own 12-digit Individual Number (nicknamed “My Number”) beginning in October 2015.**

- Your municipality will send a notification card showing your Individual Number to the address appearing in your resident record.
- If you receive a notification card, you can receive an Individual Number Card at your municipal office after sending in the application form that will arrive with the card.



**Your Individual Number will be used for administrative procedures related to social security, taxation, and disaster response beginning in January 2016.**

- Individual Numbers will be used only for legally stipulated tasks, such as procedures for the national pension, unemployment insurance and medical insurance, receipt of public assistance and welfare benefits, and the filing of income tax returns and other tax procedures.
- Private businesses will also handle Individual Numbers within a scope stipulated by law. Applicable tasks will include those related to social insurance and tax withholding.

**Use of Individual Numbers for any purpose that is not stipulated by law and providing numbers to others are prohibited.**



- Inappropriately obtaining the Individual Number of another person and providing a number to others without justifiable cause are punishable acts.
- Various measures will be implemented to protect personal information that is linked to Individual Numbers.

Individual Numbers represent a form of social infrastructure designed to improve administrative efficiency, enhance public convenience, and realize a fairer and more just society.

## Improved administrative efficiency

The system will greatly save time and labor needed to compare and input various types of information in administrative organs, local governments, etc., and bring better precision and accuracy to those tasks.

## Enhanced public convenience

The system will simplify administrative procedures and lessen the burden on residents by reducing the number of accompanying documents, etc., needed for procedures. Number holders will also be able to use services for confirming and supplying information that are based on the Disclosure System of Personal Information Cooperation Record.

## A fairer and more just society

Because it will make it easier to ascertain people's income and receipt of other administrative services, the system will prevent tax evasion and unfair receipt of benefits, and facilitate the provision of fine-tuned assistance to those who really need it.

# Japan Revitalization Strategy

The second stage of “Abenomics”

## Growth Strategy 2015

- Two and half years ago when the Abe government started, the **Japanese economy was unable to get out of the morass of deflationary economy.**
- In order to overcome such a situation, the Abe government, after the inauguration, launched the first arrow of bold monetary policy and the second arrow of flexible fiscal policy in a rapid succession aimed at supporting and stimulating demand from the macroeconomic side. Right now, it is “**in the midst of implementing**” boldly and speedily the third arrow of the Growth Strategy as a structural reform aiming to eliminate the deflationary mindset.

# Medical ICT is one of pivotal measures in Growth Strategy of “Abenomics”

## Acceleration of the preparation to the new era (“4<sup>th</sup> Industrial revolution”)

### ② Utilization of ICT to the maximum extent, reinforcing the measures against cyber threats

Reinforce **cybersecurity initiatives**, indispensable for stable activities of the government and companies  
Promote industries and enhance QOL of the population **by enlarging the utilization of ICT and the introduction of “My number system” (Social security and Tax number system)**

### **Reinforce the measures against cyber threats to protect the population and society**

- Enhance abilities to respond cyber threats (government and public institutions etc.)/ Protect “My number system”
- Encourage the actions of companies, creation of new industries, human resource capable to respond to cyber threats

### **Utilization of “My number system”**

- **Enlarge the application scope**
  - Census registration, residence report, transaction of stocks, in addition to deposit/saving accounts, and medical examination (after 2019)
- **Promote utilization of “My number card”**
  - able to receive certificates such as resident card, seal impression, or family register, at convenience stores from FY2016
  - use as health insurance card, and integrate with credit card
- **Introduction of online monitoring system**
  - provide one-stop service on the procedures such as change of residential information, notice of death etc. through electronic post office box system, after Jan. 2017



Image character  
“Maina-chan”

### **New legal framework to be prepared**

- **Creation of an institution** in charge of safe and security-ensured distribution of personal information
- **Shift from the principle of documents /face-to-face interaction to that of ICT utilization**
- **Promotion of sharing economy, drones, automatic travelling vehicles etc.**



### **Promotion of ICT utilization in medical and nursing sectors**

- **Introduction of different number system** in medical and nursing sector, Online confirmation of qualification for medical insurance early but not before Jul. 2017
- Diffuse **electronic clinical record** in 90% of large hospitals by 2020, Form nationwide Regional Medical Information Cooperation Networks by 2018 FY
- Examine methods to **evaluate effects of information exchanges at the next revision of medical treatment fees by ICT**
- Utilize to the maximum extent medical care related data-base of the government etc., to enhance the quality of treatment/service, R&D, reduction of medical expenses


### **Diffusion of ICT to the whole society**

- Promotion **of education on programming** at the primary/secondary/higher education
- Vitalization of **competition in mobile phone sector**, extension of **the frequency band for Iot or drones**

## Medical / Health care

- **Creation of a "Healthcare corporation system based on alliances in a region"** ; enable integrated management of multiple medical and social welfare corporations to provide efficient medical and nursing care.
- **Creation of a "Patient-requested cure system"** ; combining insured and uninsured medical services which allows the utilization of non-approved medicines (shortening assessment period from **current 6 months** to **6 weeks** in principle)
- **"A system for priority examination"** applied to innovative medicine
- Shortening assessment period for **the cutting-edge medical services (e.g. regenerative medicine and medical devices)**

(In addition, a special consultation system of medical device approval in the National Strategic Special Zones will be created to expedite development of innovative medical devices )

- 
- Accelerate ICT utilization in health care ;
    - to **eliminate the duplication of the medical check and prescription** , diffuse electronic clinical record in 90% of large hospitals (more than 400 beds) by 2020
    - Form nationwide **Regional Medical Information Cooperation Networks** by 2018 FY
  - Utilize 'My Number card' as **health insurance card** early but not before Jul. 2017, diffuse **Electronic Medicine Notebook** around 2018
  - Establish **a "dedicated institution"** collecting and managing personal information on medical and healthcare.
  - Provide information on hospital which accept foreign patients (**"Japan International Hospitals" (tentative name)**)
  - Certify agents which support foreign patients

# Revised Growth Strategy 2015 (August 2015)

Included in the **growth strategy** this time is that, from the standpoint of improving the convenience of people, the Government will thoroughly advance the **use of ICT in the healthcare fields** by **setting 5 years of intensified effort period** until 2020 by ensuring security.

(1) Support for the creation of **next-generation health care industry**

(2) Introduction of a numbering system in healthcare related areas

**Utilize the infrastructure of the My Number system** to introduce a numbering system in healthcare related areas

(3) Promotion and widespread introduction of **Regional Medical Information**

## **Cooperation Networks/Electronic health record**

1. Achieve **nationwide expansion** of the **regional medical information sharing network** by the **2018** fiscal year. **By fiscal 2020**, raise the national diffusion rate of **electronic medical records** to **90%** at general hospitals with **400 or more beds**, which are expected to **play a central role in regional medical care**.

2. To achieve the above objective, take measures to provide **support for network creation via the fund** for specialization/coordination of hospital beds. Additionally, at the time of the **next revision of remuneration for medical services**, discuss **evaluations of medical information sharing** that utilizes ICT within remuneration for medical services.

(4) **Further promotion of data utilization** in **policy for medical care** and similar fields

# New trends for Medical ICT

## Medical BigData, Genome/Omics medicine, mHealth

- Achieving both the satisfaction of patients' various needs and the provision of cutting-edge technologies and services by substantially expanding the system for **combining insured and uninsured medical services**.

- Genome/Omics medicine:**

- Promotion Council of implementation of genomic medicine issued the report this July
- Clinical sequencing to identify the disease causative gene at POC
- To identify the cancer driver gene to assign the patient to clinical trial of anti-cancer drug. National Cancer Center

- Utilization of Big data in medicine**

- Plans to promote nation-wide collection of EMR
- Promotion of utilize National Database
  - Collected national health insurance data
- Revise of personal information protection law

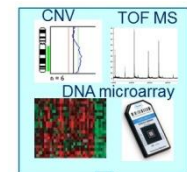
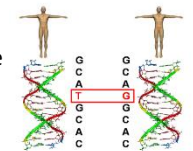
- Mobile Health (mHealth)**

- Various wearable devise to measure vital sign
- Unobstrusive sensing



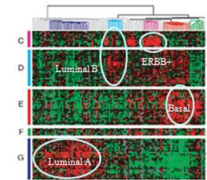
1000 \$ genome  
Illumina X

1<sup>st</sup> generation  
genomic medicine

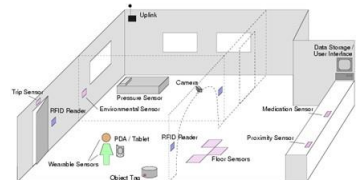


3<sup>rd</sup> generation  
systems medicine

2<sup>nd</sup> generation  
omics medicine



Patient specific network aberration



ECG, EEG, Skin Conductivil

light from the Shoulder  
John M. Kistner, M.D.  
PG&P#2  
www.pgandp.org  
The New England Journal of Medicine

IBM Watson  
Learning Big  
Data





# Conclusion

- Promotion of Medical ICT in Japan is now accelerated by the government support taking the Medical ICT as one of pivotal policies in Growth Strategy of Japan Revitalization Strategy of Abe government.
- “My Number” system and Promotion of Regional Healthcare Information System accelerate diffusion of Medical ICT in Japan.
- Next generation Medical ICT such as Medical Big Data, Genome/Omics medicine, mobile Health are already prepared to start to be implemented in ordinary medical practice.