

Healthcare

1 Innovation in Cancer Precision Medicine through Digital Transformation

Cancer genomic medicine has recently begun in Japan, cancer treatment based on genomic information involves detecting genetic abnormalities in cancer cell to select treatment options matched to cancer cell characteristics. Optimal treatment for the patient is investigated by a multidisciplinary team of experts known as a Molecular Tumor Board (MTB). With new relationships between treatment options and genetic abnormalities being found every day, discussion of the latest candidate treatment options by MTB is important for improving patient outcomes.

But heavy workloads of MTB members are required for tasks such as the highly time-consuming searches for the latest treatment options done by physicians. To solve this issue, Hitachi has developed an MTB assistance service through a collaborative creation project with the Personalized Medicine Center of Tohoku University Hospital that provides candidate treatment options and decrease the burden of physicians.

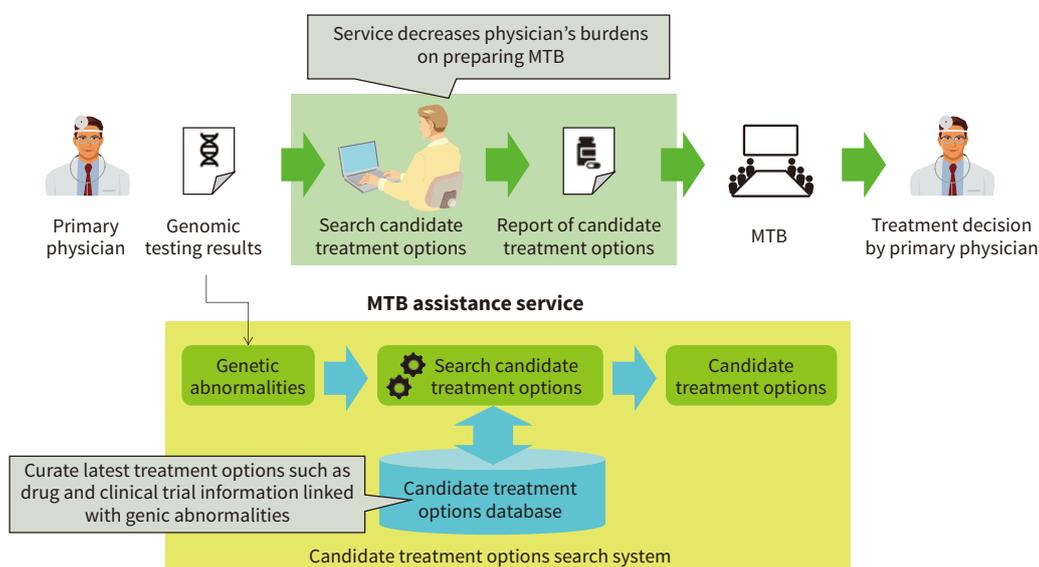
Hitachi will utilize genomic analysis information and artificial intelligence (AI) technologies to create

solutions for big data analysis of genomic medicine. By providing solutions that enable physicians to make efficient clinical decisions on personalized treatment options, Hitachi will contribute to bring advanced cancer precision medicine to as many patients as possible.

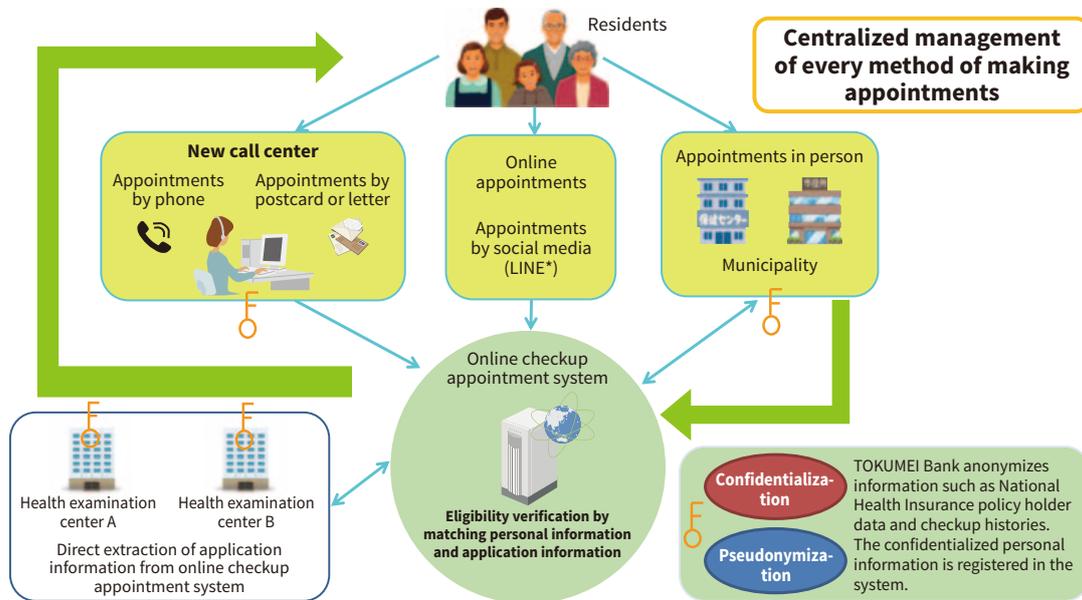
2 Online Checkup Appointment System Service for Municipalities (PoC)

Undergoing specific health checkups to address medical issues early before they become severe ensures the maintenance of public health and helps cut medical costs of insurers such as municipalities. But the utilization rate for specific health checkups provided by Japan's municipalities was only 37.2% (early estimate for FY2017), far below the 60% target set by the national government.

But with the healthcare industry slower than other industries to embrace the use of IT, difficult-to-understand and inconvenient application procedures are becoming one of the major causes of the low checkup utilization rate. Improving them will be the first hurdle for improving the checkup utilization rate.



1 Overview of MTB assistance service



* See "Trademarks" on page 151.

2 Checkup appointment system that improves convenience and increases work efficiency

Hitachi is responding by providing a proof-of-concept (PoC) nudge-theory-based online appointment system that uses Hitachi's TOKUMEI bank to provide an eligibility check function while securely managing personal information. The company is working on improving the checkup utilization rate by providing a system designed to improve resident convenience and increase municipality work efficiency.

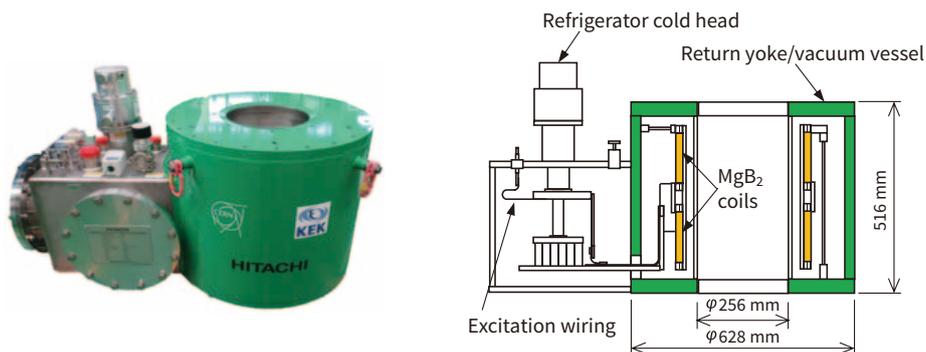
The superconducting magnet will be used in a microwave generator (klystron) in an accelerator system being planned by the European Organization for Nuclear Research (CERN). It is a prototype model that enables a major reduction in power consumption and a dramatic improvement in klystron efficiency. CERN's klystron currently uses water-cooled copper coils. The new magnet will be able to reduce its power consumption to one-seventh or less of its current value. By using MgB₂ wire, the magnet can generate a 0.8 T magnetic field when powered at its rated value of 57.1 A and with the coil cooled to about 20 K by conduction cooling.

3 Delivery of Superconducting Magnet Made with High-temperature Superconducting MgB₂ Wire

Hitachi has developed a superconducting magnet made with Hitachi-produced high-temperature superconducting magnesium diboride (MgB₂) wire. It has been delivered to the High Energy Accelerator Research Organization (KEK).

The magnet was manufactured by using MgB₂ wire with suitable performance. A total of 8,000 m was manufactured, and 5,600 m of this length was used.

Hitachi is planning to develop a number of different MgB₂-based superconducting magnets designed to eliminate refrigerants and reduce power consumption.



3 Photograph and structure of MgB₂ superconducting magnet for klystrons