

## Department of Innovation for Medical Information Technology

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### General Summary

This course deals broadly with ICT (Information and Communication Technology), an area that has seen remarkable development in recent years, including everything from basic research on its development to clinical application, with the aim of using ICT in medical care.

We are studying the development of wearable devices and AI (artificial intelligence) that link with telecommunications. We are also conducting research and development toward implementing ICT medical care in a wide variety of areas, including health management, emergency care sites, intra-hospital networks, and chronic-phase rehabilitation and nursing care.

### Research Activities

#### *Research and development of a communication application for medical personnel*

We are researching and developing a piece of software called “Join,” the first such software to be covered by insurance in Japan. The research investigates factors including the cost-effectiveness provided by communication in the field of stroke treatment, in which the time leading up to diagnosis and treatment is especially important.

#### *Research and development of a health support application*

We are researching and developing a piece of software called “MySOS.” When an emergency arises, this app seeks help from nearby people, and helps make the decision whether or not to go to a hospital, referring to emergency manuals for adults and children. Future development will focus on enabling linkage with hospitals.

#### *IoT (Internet of Things) development (checking blood pressure by smartphone, etc.)*

We are going forward with the development of IoT wearable devices as a means of accumulating large quantities of data. In the development of wristwatch-type blood pressure meters and band-type EEGs, we are advancing development from the standpoint of storing large amounts of personal medical information in the cloud via smartphone, and defending against illness.

#### *Mobile phone electromagnetic wave effects*

We are doing research relating to the effects of smartphones on medical equipment. The research will determine whether there really are no issues with using smartphones at medical care facilities. We are publishing a paper on this subject.

*Medical equipment development (intracranial stents, etc.)*

We are conducting discussions on the development of medical equipment, as well as the practical development of intracranial stents. Currently, the Japanese medical equipment industry is heavily dependent on imports. Our ultimate goal is to contribute to the advancement of the domestic health care industry by offering various types of support and holding actual physician-led clinical trials, so that the health care industry in Japan can be self-sufficient.

*Introducing ICT medical care*

We are doing various studies on the introduction of ICT medical care. It is said that using ICT in various aspects of nursing and caregiving would improve work efficiency in these areas. The aim is to put this into practice.

*Medical results of using robots*

We are conducting research, using Pepper, on interaction between robots and people. We are studying what changes occur in health care facilities when people see and come into contact with robots.

**Publications**

**Fujimura S, Takao H, Suzuki T, Dahmani C, Ishibashi T, Mamori H, Yamamoto M, Murayama Y.** Hemodynamics and coil distribution with changing coil stiffness and length in intracranial aneurysms. *J Neurointerv Surg.* 2018; **10**: 797-801. Epub 2017 Dec 19.

**Fujimura S, Takao H, Suzuki T, Dahmani C,**

**Ishibashi T, Mamori H, Yamamoto M, Murayama Y.** A new combined parameter predicts re-treatment for coil-embolized aneurysms: a computational fluid dynamics multivariable analysis study. *J Neurointerv Surg.* 2018; **10**: 791-6. Epub 2017 Dec 15.