

## News Release

Developing competencies relating to information science and technology in Japanese undergraduate medical education

### Key Points

- The Model Core Curriculum for Medical Education in Japan underwent a revision to incorporate “the ability to use information science and technology” as a new competency. We aimed to identify precise learning objectives that medical students must achieve to acquire this new competency.
- As a result of the literature survey and two rounds of expert panel surveys, 13 learning objectives were identified.
- Learning objectives were classified conclusively into three categories: “Ethics and rules for dealing with information science and technology,” “Principles of information science and technology necessary for medical care and surrounding society,” and “Application of information science and technology in clinical practice.”

### Summary

In response to the growing expectation and recognized potential for integrating information and communication technology (ICT) into medicine, the Model Core Curriculum for Medical Education in Japan incorporated “the ability to use information science and technology” as a new competency in its 2022 revision. This study aimed to identify specific learning objectives that medical students should achieve to acquire this competency. The research team developed an initial list of 107 learning objectives through a literature survey. Subsequently, two rounds of expert panel surveys were conducted to refine these objectives. Seventy-four medical education stakeholders participated in the expert panel, including medical and non-medical faculty, medical students, graduate students, and university staff. Through the expert panel surveys, 13 learning objectives were finally established from the initial list, consisting of three categories: “Ethics and rules for dealing with information science and technology,” “Principles of information science and technology necessary for medical care and surrounding society,” and “Application of information science and technology in clinical practice.” Our investigation effectively identified essential components of competencies for integrating ICT into medical

education. The identified learning objectives would provide valuable insights for designing curricula for undergraduates in the new era of information and artificial intelligence.

## **Research Background**

In response to the growing expectation and recognized potential for integrating information and communication technology (ICT) into medicine, “the ability to use information science and technology” was incorporated as a new competency domain into the 2022 revision of the Model Core Curriculum (MCC) for Medical Education in Japan, which is Japan’s competency model for medical education. As with most other competency models, the MCC is composed of competency domains and, under them, more specific learning objectives. To make the curriculum based on this new competency domain feasible in the educational setting, it was necessary to identify more specific goals as learning objectives required to acquire the competency. Therefore, in this study, as part of the process of developing the MCC, we aimed to clarify ‘What are the learning objectives that medical students should achieve to acquire the ability to use information science and technology?’ in the context of integrating this competency domain into the national competency model.

## **Research Results**

The research team developed an initial list of 107 learning objectives through a literature survey. Subsequently, two rounds of expert panel surveys were conducted to refine these objectives. Seventy-four medical education stakeholders participated in the expert panel, including medical and non-medical faculty, medical students, graduate students, and university staff. Through the expert panel surveys, 13 learning objectives were finally established from the initial list (Table 1), consisting of three categories: “Ethics and rules for dealing with information science and technology,” “Principles of information science and technology necessary for medical care and surrounding society,” and “Application of information science and technology in clinical practice.”

Table 1. Finalized list of Learning Objectives.

Ethics and rules for dealing with information science and technology
<ul style="list-style-type: none"> <li>• Understand the importance and social significance of using information science and technology in medicine.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand an overview of the regulations, laws, and guidelines related to information science and technology in medicine.</li> </ul>
<ul style="list-style-type: none"> <li>• Discuss ethical issues, such as social disparities caused by the digital divide, that may arise in the use of information science and technology in medicine.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the principles of medical data management and storage, including electronic medical records, and comply with relevant regulations, laws, ethical standards, and provisions for protecting personal information.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand and practice appropriate use of social media as a healthcare professional.</li> </ul>
Principles of information science and technology necessary for medical care and surrounding society
<ul style="list-style-type: none"> <li>• Use digital devices, such as PCs and smartphones, to make use of information science technology, such as the internet and apps, in medical practice.</li> </ul>
<ul style="list-style-type: none"> <li>• Solve problems using the information and data collected using information science and technology.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand information science and technology related to medical care (medical information systems, wearable devices, applications, artificial intelligence, telemedicine technology, and the Internet of Things [IoT]) and discuss their potential applications.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the role required of medical professionals when applying information science and technology to medical care by working together with relevant specialists.</li> </ul>

Application of information science and technology in clinical practice
<ul style="list-style-type: none"> <li>• <b>Demonstrate effective documentation and use of features unique to electronic medical records.</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Understand the pros and cons of remote communications, and select and use appropriate tools (e-mail, video conference systems, and social media) according to the intended purpose.</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Use appropriate digital devices and applications (e-learning, mobile technology, etc.) for self-learning and cooperative learning.</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Develop flexibility in using new information science and technology in one's own learning and medical practice.</b></li> </ul>

## Research Summary and Future Perspective

Our investigation effectively identified essential components of competencies for integrating ICT into medical education. The identified learning objectives would provide valuable insights for designing curricula for undergraduates in the new era of information and artificial intelligence.

## Publication

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