



**FUJIWARA, Michitaka**

Graduate of Nagoya University School of Medicine, PhD in Medicine. Formerly associate professor of an endowed chair at Nagoya University School of Medicine, and currently associate professor of the Nagoya University Graduate School of Medicine. Areas of specialization: gastroenterological surgery, endoscopic surgery

**By simulating medical settings and honing expertise in treatment techniques using state-of-the-art equipment**

To improve patient safety, simulation education is considered vital training at medical institutions around the world. At Nagoya University, the Skills & IT laboratory was established in 2006 and we have devoted resources to developing simulation education from early on. These facilities have been passed down to subsequent generations, and further bolstered with equipment to meet the needs of physicians in each of the clinical departments. In 2012, it was renamed the Clinical Simulation Center (CSC). The CSC has a surgical simulator that makes use of the latest virtual reality (VR) technology, a high specification mannequin that can be programmed to reproduce various disease states using a computer, organ models, and many examples of actual surgical equipment. There are also image generating rooms and 3D printer rooms. Simulation rooms to practice surgery and endovascular treatment are available for use by all registered doctors 24-hours-a-day and can handle training between busy clinical training schedules. These educational facilities are available for use by a broad range of medical specialties including medical students, physicians, pharmacists, clinical engineers, and radiation and clinical laboratory technicians. It caters to various disciplines ranging from basic treatment techniques to surgery, endoscopy, ultrasound tests, endovascular treatment, and delivery, providing training in essential skills for a broad range of specialties. The facilities are also open to people outside Nagoya University and approximately 10,000 people make use these resources every year. Students interview simulated patients in the mock treatment room, not only to acquire practical skills but also to hone communication skills. Next to the surgical training areas is a display of recent advances in surgical equipment and an unequalled historical gallery presents not only valuable materials but also assists in educating new surgeons.

**Diverse simulations are used for education in medical techniques during clinical practice**

In medical school, clinical practice currently start from the 5th year. Students study medicine through actual contact with patients during clerkships in each of the department wards. To participate in these clinical practice, the students must first pass examinations in didactic and practical skills that determine whether a student's clinical abilities meet required standards. Students prepare intensely for these tests at the CSC to acquire physical assessment and critical care skills. After 2020, testing of practical skills after completion of the clinical practice will be a requirement for graduation, and CSC use is expected to rise even further. During clinical practice, many educators in the various clinical departments will use simulation education at the CSC in addition to training in the wards. For example, in surgery, students can not only observe surgeries, but also acquire surgical experience through the use of VR simulators to simulate and practice various surgeries. Skills laboratory is a commonly found facility in medical universities, but the CSC at our school is particularly robust. It offers training in surgery and testing and offers simulators for a wide range of treatment techniques, meeting the needs of each of the medical departments. VR simulator use involves actually moving ones hands while watching the monitor and allows students to experience practicing techniques that feel very close to the actual surgery. In medical education, early experiences that enhance student motivation is recommended and CSC functions effectively towards this goal.

**Use of simulation education develops clinical clerkships**

We continue to revise our medical curriculum to ensure it always meets international standards. Current requirements call for practice-oriented clinical practice curricula with ever

more student engagement. Until recently, it was considered difficult to evaluate practical student skills and provide feedback on an individualized basis. Students also need to learn to identify issues and goals in the clinical setting for themselves. Simulation practice allows students to propose objectives and methods and we are now considering how assessment can also be conducted jointly between educator and student. Simulated clinical practice and bedside practices are closely intertwined. With this training, both the medical student experience and patient safety are ensured. We hope to build an educational program with a level of freedom only possible under simulated medicine. Currently, I am creating a program in my own clinical department. My hope is to complete this quickly while carefully verifying and improving it. I also hope to extend program development to even more departments to contribute the fostering of physicians and researchers that will lead medicine and healthcare in the future.

One of the CSC's roles is not only to educate medical students and other medical professionals, but also to train human resources for industrial positions which will be essential to ensure cutting-edge development of medical technologies. The goal is to ensure the development of new surgical support equipment or training devices. We have engaged in collaborative research with medical engineering technologies and industry-academia cooperation using organ models. Our surgical simulators and surgical equipment gallery is also available for use by pharmaceutical companies in training their personnel. In this way, we feel it is important to utilize the CSC in educating people in a broad range specializations. It is our hope that the CSC will continue to make progress as a central headquarters for simulation medicine and education.



Associate Professor of Medical Education,  
Graduate School of Medicine

**FUJIWARA, Michitaka**

**“Cutting-edge simulation techniques in education nurture medical professionals to lead us into the future.”**