

MEDIA RELEASE

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SINGAPORE AND JAPAN CLINICIAN-SCIENTISTS COLLABORATE ON GROUNDBREAKING TELESURGERY TRIAL SPANNING OVER 5,000KM

This preclinical trial surgery involves clinician-scientists in NUS Medicine and the National University Hospital in partnership with Fujita Health University

SINGAPORE — Picture this: in a sterile operating room in Nagoya, Japan, robotic arms move with astonishing precision as they prepare to perform a complex laparoscopic surgical procedure.

What makes this scenario truly remarkable is the surprise twist—it's not the surgical team in Nagoya controlling these robotic arms.

Instead, they are being orchestrated by surgeons located over 5,000km away in the Advanced Surgery Training Centre at Singapore's National University Hospital (NUH), the teaching hospital of the Yong Loo Lin School of Medicine at the National University of Singapore (NUS Medicine).

In this extraordinary fusion of technology and medical expertise, clinician-scientists from Singapore and Japan are embarking on an exciting new collaboration - robotic telesurgery, aided by recent developments in advanced surgical robots and network telecommunication technology.

NUS Medicine and NUH are collaborating with Fujita Health University (FHU) in its first robotic telesurgery trial between Singapore and Japan, from 9 to 11 October 2023.

Leveraging Japan's first surgical robot, clinician-scientists from NUH and NUS Medicine will remotely perform a gastrectomy (stomach surgery performed for cancer) from a surgeon cockpit in Singapore. The surgeons' movements will be transmitted, directed, and replicated by a robotic operation unit located in Japan via a dedicated international fiber-optic network, all performed on a simulated organ (refer to Annex A for technical details on the remote surgery setup and connection).

This collaboration follows the Memorandum of Understanding (MOU) signed in August 2023 between NUS Medicine and FHU, one of Japan's leading universities with a strong research focus in robotic surgery and telesurgery. The MOU aims to deepen academic partnership through active joint collaborations, including the execution of remote surgical experiments, and by promoting mutual exchange activities such as student exchange programmes.

Harnessing the potential of telesurgery

The two gastric surgeons leading the demonstration in Singapore are **Professor Jimmy So** from the Department of Surgery, NUS Medicine, and Senior Consultant in the Department of Surgery, NUH, as well as **Assistant Professor Kim Guowei** from the Department of Surgery, NUS Medicine, and Consultant in the Department of Surgery at the NUH.

In Japan, the surgical team is led by Professor Ichiro Uyama and Professor Koichi Suda from Fujita Health University.

Tapping on FHU's vast expertise in robotic surgery, this latest project aims to evaluate, clarify and address the potential issues arising from such remote surgeries.

The preclinical trial – involving a series of complex gastrectomy procedures conducted by both teams – aims to prove that long-distance robotic telesurgery for technically demanding procedures can be safely conducted using a robotic system connected by high-speed fiber-optic communication.

While robotic surgery is not new in Singapore, this collaboration between NUS Medicine, NUH and FHU marks a critical step towards making remote surgeries an accessible option to patients in the near future.

Professor Jimmy So, who led the surgical team in Singapore, said, "Remote telesurgery offers immense potential to enhance global access to specialised care, reduce travel and wait times for patients, minimise health risks during emergencies and pandemics, and foster training and collaboration among medical professionals worldwide. It also contributes to improved surgical expertise for complex cases, particularly benefiting underserved areas."

During public health crises, such as a global pandemic, remote telesurgery helps minimise the risk of disease transmission between patients, healthcare workers, and surgical teams. Surgeons can perform surgeries from a safe location, reducing the potential for infection spread.

Such forms of surgery also help promote tele-mentoring or distance learning in medical education, allowing young doctors and medical students to learn surgical techniques and skills from lecturers and medical experts based not only in a different part of Singapore, but also anywhere in the world.

Assistant Professor Kim Guowei added, "In partnering with our Japanese colleagues, we hope to advance and unlock the potential of telesurgery for patients and doctors alike. This continuous exchange of knowledge, advanced surgical techniques, and best practices across borders contributes to improving surgical expertise and outcomes."

Chinese Glossary

National University Hospital (NUH)	国立大学医院 (国大医院)
National University of Singapore (NUS)	新加坡国立大学
NUS Yong Loo Lin School of Medicine (NUS Medicine)	新加坡国立大学杨潞龄医学院 (国大杨潞龄医学院)
Fujita Health University	藤田医科大学
Professor Jimmy So	苏博欣教授
Department of Surgery, NUS Yong Loo Lin School of Medicine (NUS Medicine)	杨潞龄医学院外科系 新加坡国立大学
Head and Senior Consultant, Division of General Surgery (Upper Gastrointestinal Surgery), Department of Surgery, National University Hospital (NUH)	上肠胃外科主任兼高级顾问医生 国立大学医院
Assistant Professor Kim Guowei	金国伟助理教授
Consultant, Division of General Surgery (Upper Gastrointestinal Surgery), Department of Surgery, National University Hospital (NUH)	上肠胃外科顾问医生 国立大学医院
Department of Surgery, NUS Yong Loo Lin School of Medicine (NUS Medicine)	杨潞龄医学院外科系 新加坡国立大学
Professor Ichiro Uyama Professor and Head of Advanced Robotic and Endoscopic Surgery, Fujita Health University School of Medicine	宇山一朗教授 尖端机器人及内窥镜外科主任 藤田医科大学医学院
Professor Koichi Suda Professor and Head, Divisions of GI & HPB Surgery, Department of Surgery, Fujita Health University	须田康一教授 综合消化道外科主任 藤田医科大学

For media enquiries, please contact:

HOI Wan Theng
Senior Manager, Group Communications
National University Health System
Email: wan_theng_hoi@nuhs.edu.sg

Amanda YAP
Assistant Manager, Communications
NUS Yong Loo Lin School of Medicine
Email: medajjy@nus.edu.sg

About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established more than 20 NUS Overseas Colleges entrepreneurial hubs around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit nus.edu.sg.

About the NUS Yong Loo Lin School of Medicine (NUS Medicine)

The NUS Yong Loo Lin School of Medicine is Singapore's first and largest medical school. Our enduring mission centres on nurturing highly competent, values-driven and inspired healthcare professionals to transform the practice of medicine and improve health around the world.

Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of Asia's leading medical schools and ranks among the best in the world (Times Higher Education World University Rankings 2023 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2023).

For more information about NUS Medicine, please visit <https://medicine.nus.edu.sg/>.

About National University Hospital (NUH)

The National University Hospital (NUH) is Singapore's leading university hospital. While the hospital at Kent Ridge first received its patients on 24 June 1985, our legacy started from 1905, the date of the founding of what is today the NUS Yong Loo Lin School of Medicine. NUH is the principal teaching hospital of the medical school.

Our unique identity as a university hospital is a key attraction for healthcare professionals who aspire to do more than practise tertiary medical care. We offer an environment where research and teaching are an integral part of medicine, and continue to shape medicine and transform care for the community we care for.

We are an academic medical centre with over 1,200 beds, serving more than one million patients a year with over 50 medical, surgical and dental specialties. NUH is the only public and not-for-profit hospital in Singapore to provide trusted care for adults, women and children under one roof, including the only paediatric kidney and liver transplant programme in the country.

The NUH is a key member of the National University Health System (NUHS), one of three public healthcare clusters in Singapore.

Annex A

Telesurgery setting and connection between NUS Medicine, NUH and FHU

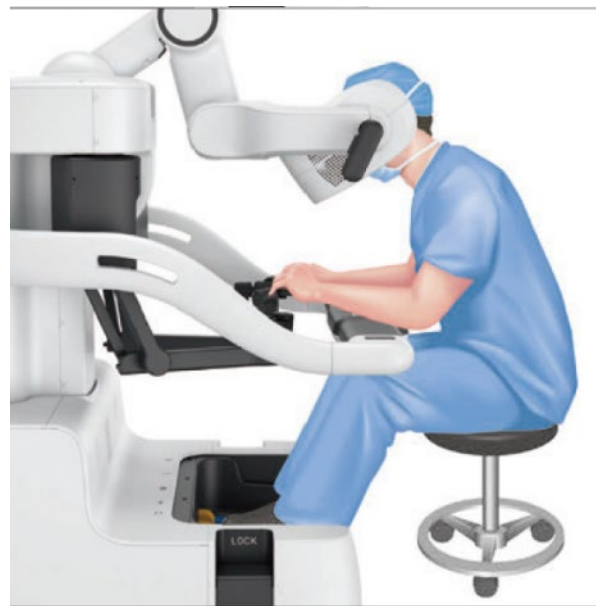
The surgical robot comprises a surgeon cockpit with a manipulator and operation unit with four arms for instruments, including a camera scope.

This robot became the first robotic-assisted surgery system created in Japan to obtain regulatory approval from the Japanese authorities in August 2020.

Fig. 1 Surgical Robot System.



Surgeon's console



Operating cart

Fig. 2 The network map and distance covered.

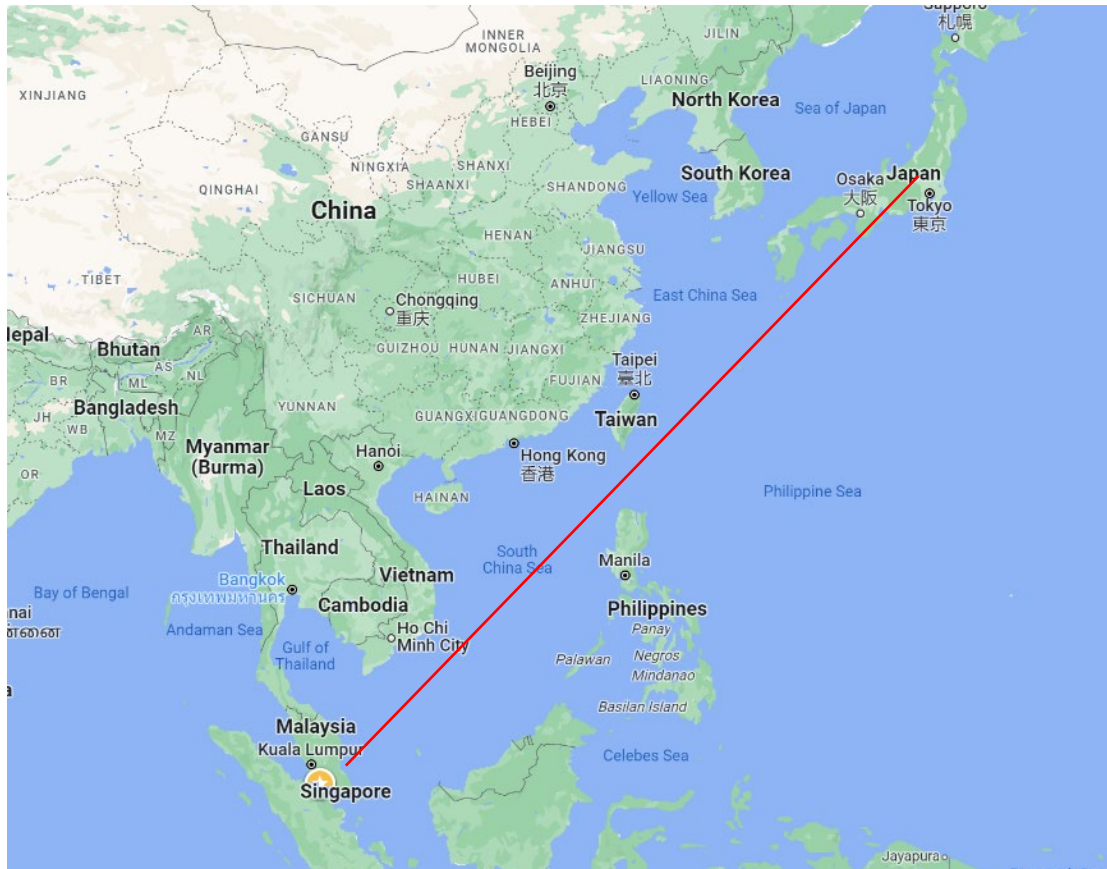


Fig. 3 The tele-surgical setting and connection between NUS Medicine/NUH in Singapore and Fujita Health University in Japan. In Singapore, this surgical robotic system is being supported by internet connectivity, provided by Singapore Advanced Research and Education Network (SingAREN).

This cross-collaboration, robotic telesurgery endeavor is made possible by the WIDE Project, whose aim is to bring researchers together through a robust interdisciplinary research network.

