

Cardiothoracic Surgery

The Division has published research on minimally invasive thoracic surgery, aortic surgery, coronary bypass conduits and mitral valve repair.

As the long-term success of coronary artery bypass surgery is still limited by saphenous vein graft occlusion, we have conducted experimental research on the prevention of vein graft failure, using external support together with pharmaceutical and gene therapy.

Mitral valve repair is the gold standard in therapy for patients with degenerative mitral regurgitation. With the cardiology team at the Faculty of Medicine, we have used echocardiography to determine best ring selection as well as long-term outcomes.

We are also early adopters of new technologies in aortic surgery (frozen elephant trunk, false lumen occlude devices). Working with our colleagues in cardiology and radiology, we research novel techniques to determine outcomes after stenting (intra procedure pressure monitoring, transoesophageal echocardiography, computerised flow dynamics). Additionally, we are leading an echo screening project to detect aortic aneurysms. The Division has a global reputation for data collection and is leading an international multicentre database project as well as hosting an Asian Aortic Database.

We reported the world's first combined hybrid operating room dynaCT guided single port video-assisted thoracoscopic surgery (VATS) lobectomy and are conducting ongoing prospective studies to compare conventional VATS and single port VATS. Also in progress are projects to develop surgical instruments and cameras in collaboration with the Department of Biomedical Engineering.

Our Division works with the Surgical Research Laboratory, with projects underway in the underlying cellular mechanism and signalling pathways of lung cancer. International multicentre studies are also investigating the role of hybrid operating room electromagnetic navigation bronchoscopy guided catheter ablation or direct-drug therapy in lung cancer.

Working with colleagues in anaesthesia, the Division is involved in research related to outcomes in patients following cardiac surgery, including post-operative delirium, fast tracking of patients, the generation of risk scores, and adoption of automated ventilation.

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Surgery

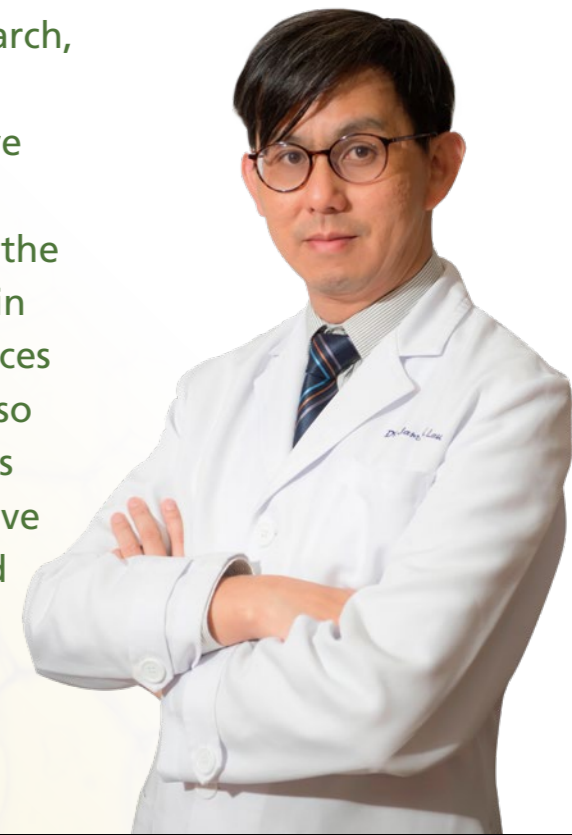
Founded in 1984, the Department of Surgery has a long tradition of excellence in clinical care, research and teaching. In 2016/17 alone, the Department performed nearly 4,000 ultra-major and major operations, and that number continues to grow. This high volume of complex surgery allows us to sharpen skills and maintain surgical excellence. With a high degree of sub-specialisation, our Department has nearly 70 specialist surgeons serving the community with distinction.

In the 1990s, the Department pioneered minimally invasive surgery and advanced endoscopy in Hong Kong and the Asia Pacific region. We are also known throughout the world for publishing landmark clinical trials in these fields. In addition, we were among the first in Asia to establish robotic-assisted colorectal and urological surgery programmes. The Department has received generous endowments and donations for establishing centres in surgical outcome research, education, stem cell research and collaborative research in biomedical engineering. In 2017/18, the Department received funds of HK\$21.6 million from competitive grants and donations towards basic laboratory, clinical and translational research. Our aim is to contribute knowledge to both the local and international medical communities.

DEPARTMENT OF SURGERY

“Founded by Professor the Honourable Arthur KC LI in 1982, the Department of Surgery focuses on excellence in clinical work and scholarly research, with a strong commitment to education and training. Over past decades, these values have been at the core of our academic activities. Located within the Prince of Wales Hospital, the Department of Surgery offers opportunities in clinical and laboratory research in basic sciences as well as biomedical engineering. We are also committed to improving care for our patients through research in clinical outcomes and have been at the forefront of both endoscopy and laparoscopy technology.”

James LAU
Chairman



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Hepato-biliary and Pancreatic Surgery

The Division of Hepato-biliary and Pancreatic Surgery is active in basic science and clinical research in hepatocellular carcinoma and pancreatic cancers. With a reputation for minimally invasive surgery, the Division was one of the first in the region to have a programme of laparoscopic and then robotic liver resections. In collaboration with other disciplines, we are also active in research on transarterial chemo-embolisation, microwave and radiofrequency treatment.

In pancreatic surgery, the Division is involved in several multicentre international studies on the role of pre-operative drainage in patients undergoing pancreaticoduodenectomy surgery, the use of fully-covered metallic stents in patients with benign bile duct strictures, and endoscopic ultrasound guided tissue acquisition in pancreatic tumours, among others.

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Neurosurgery

The Academic Neurosurgical Unit was established in the early 1980s, providing care for patients with neurosurgical diseases in New Territories East, which has a catchment population of 1.5 million. We take great pride in having established clinical and experimental research in traumatic brain and spinal cord injuries, brain tumours, spontaneous subarachnoid and intracerebral haemorrhages, surgical treatment of Parkinson's disease and movement disorders, and epilepsy. Our research is supported by the University Grants Committee, Health and Medical Research Fund, Innovation and Technology Fund, and National Natural Science Foundation of China, as well as generous donations from our patrons and the community. In 2011 and 2015, we received national prizes for improved management of severe head injuries and acute stroke respectively.

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Colorectal Surgery

Minimally invasive surgery has always been the main clinical and research focus of the Division. Over the years, we have published several landmark randomised controlled trials comparing laparoscopic and open surgery in patients with colorectal cancers. Supported by research grants, our current clinical trials aim to further improve outcomes of laparoscopic colorectal surgery. These include the application of a fast-track programme, cologeriatric care, and electro-acupuncture.

Our Division offers the most advanced techniques, including robotic surgery, trans-anal surgery, and endo-luminal resection in treating colorectal neoplasms. Recently, we completed the world's first clinical trial of robotic colorectal surgery using the da Vinci SP (Single Port) Surgical System.

Functional colorectal disease is another research focus of our Division, for which we are currently evaluating two innovative diagnostic systems – the EndoFLIP and Fecobionics. Moreover, we are investigating the use of transcutaneous electric nerve stimulation on acu-points (Acu-TENS) in patients with defaecatory disorders.

In collaboration with the Institute of Digestive Disease, we are conducting clinical research related to population-based colorectal cancer screening, as well as translational research in diagnostic and prognostic biomarker discovery for colorectal cancer. Other basic research interests of the Division include immunotherapy for colorectal cancer and adipose-derived mesenchymal stem cell therapy for anastomotic healing.

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Upper Gastro-intestinal and Metabolic Surgery

The Upper Gastro-intestinal and Metabolic Surgical Division is world renowned for its clinical research in interventional endoscopy and treatment of gastroesophageal malignancy and peptic ulcer diseases. In the past two decades, we have extended our service and research to bariatric/metabolic surgery, minimally invasive endocrine surgery, perioperative nutrition and the Early Recovery Program (ERAS) after gastric surgery. In bariatric surgery, we are interested in the specific aspects of diabetic control among Hong Kong Chinese people, endoscopic gastroplasty, and a study of the genetic profiles of obese patients and their correlation to post-obesity surgery outcomes. Other research interests include per oral endoscopic myotomy in the treatment of patients with achalasia, anti-reflux endoscopic mucosectomy, and the development and clinical application of endoscopic robots.

Our research also focuses on innovative endoscopic ultrasound guided interventional procedures, such as choledocho-duodenostomy and choledocysto-duodenostomy with various indications. In our clinical service, we offer robotic oesophago-gastrectomy and thyroid surgery. Our collaboration with interventional radiology was the first to compare percutaneous radiofrequency ablative treatment on benign adrenal tumours with laparoscopic adrenalectomy.

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Urology

Our Division has enjoyed close collaborations with other clinical departments and industry partners and has completed many Phase 2 to Phase 4 clinical trials. We are also a China Food and Drug Administration (CFDA) accredited centre at CUHK.

We lead many local and international studies, including research in several major areas. In uro-oncology, we seek to identify new serum markers for the diagnosis of prostate cancers and evaluate the use of hormone therapy, including some novel hormonal drugs. We also perform laparoscopic and robotic urologic surgery with careful audits of the outcomes. We have published extensively on improving the performance of extracorporeal shockwave lithotripsy for urolithiasis, and our urology centre has been commissioned by the Hong Kong SAR Government to evaluate patients with voiding dysfunction from ketamine cystitis. Additionally, we have collaborated with interventional radiologists in the study of prostate artery embolisation as an alternative to prostatic resectional therapy.

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Surgical Oncology Laboratory

Focused on the molecular basis of human cancers, our research team has deciphered liver cancer expression profiles and metastasis associated genes. Ongoing research includes the identification of potential therapeutic targets, growth factor granulin-epithelin precursor (GEP) and its roles in cancer growth, invasion, drug resistance, cancer stemness properties and antibody targeted therapy.

We have extended our studies from genomics to examine novel molecular biomarkers on diagnostic with prognostic implication. Current research focuses on natural killer cell-mediated cytotoxicity against tumour cells and rational combination therapy to improve treatment efficacy.

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Bioengineering in Surgery

Bioengineering or biomedical engineering is the application of engineering principles and design concepts in medicine and biology for healthcare. This field is narrowing the gap between engineering and medicine, combining the design and problem-solving skills of engineering with biomedical sciences to advance healthcare treatments.

Our current areas of research interest include wearable sensing, endoscopic informatics and smart cancer screening. We develop innovative medical devices and robotics, including flexible surgical instruments/robotics, soft medical robotics and magnetic anchored and guided systems. In addition, we are studying visceral biomechanics, gastrointestinal (GI) mechanosensory properties, the development of endoluminal devices for the treatment of obesity, and diagnostics of functional GI disorders.

We use experimental and computational approaches to address surgically relevant healthcare problems and have published our findings in leading bioengineering and medical journals. Currently, we are focused on development of several medical devices for diagnostics and therapy, including performance and validation studies, and proof-of-concept clinical trials.

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