



REDEFINING MEDICAL EDUCATION

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Editor's Corner

In a year's time, the Lee Kong Chian School of Medicine will welcome its pioneer intake. These students are set to make history, as they embark on what promises to be an extraordinary journey with the School.

We at LKCMedicine cannot imagine anything more exciting than this – to mould competent, confident and future-ready doctors and medical leaders who will meet the School's ambitious aims to redefine medicine and transform healthcare.

Since the School's establishment in 2010, the speed and efficiency with which the integrated curriculum, pedagogical tools, key infrastructure and administrative structures have been put in place, has been nothing short of astounding.

From August 2013, LKCMedicine's students will be taught an excellent medical curriculum by world-class experts. They will be working in teams in a technology-enhanced environment, and will gain clinical exposure in hospitals and in all settings where healthcare is delivered, right from the start of their education.

And in five years, they will enter the profession with substantive knowledge and practical skills, deliver care intelligently and compassionately, and put the patient at the centre of their exemplary care. They will be distinguished by their humility, professionalism, integrity and compassion, as well as commitment to excellence and continuous learning.

The LKCMedicine newsletter aims to chronicle this journey of our students as they blossom into outstanding doctors. It also aims to capture the work of the faculty and staff who deliver our innovative medical education. There will also be progress reports on research undertaken at the School, and medical discoveries here and elsewhere. Consider the newsletter a pulse meter of the exciting happenings at Singapore's newest medical school. So, sit back and enjoy this first edition. As you read the articles here, I invite you to join us on this journey of imagining the future of healthcare and seeing it unfold right here at LKCMedicine.

Siti Rohanah Koid
Editor-in-Chief

LKCMedicine Welcomes New Dean



Immunology and infectious diseases pioneer, Professor Dermot Kelleher, to helm Lee Kong Chian School of Medicine.

Professor Dermot Kelleher, the incoming Principal of the Faculty of Medicine at Imperial College London, was appointed Dean of the Lee Kong Chian School of Medicine (LKCMedicine) on August 1st 2012. As Dean, Professor Kelleher will lead the next phase of the development of the School to train more doctors to meet Singapore's future healthcare demands.

Professor Kelleher, former Vice-Provost for Medical Affairs and Head of the School of Medicine at Trinity College Dublin in Ireland, has over 30 years' experience in research, teaching and medical leadership. He combines his appointment as Dean with his position as Principal of Imperial's Faculty of Medicine. With Professor Kelleher's appointment, Professor Stephen Smith, the Founding Dean of LKCMedicine, will focus on his role as NTU's Vice President of Research.

Sir Keith O'Nions, President and Rector of Imperial College London, said, 'We are delighted that Professor Kelleher will direct the Lee Kong Chian School of Medicine alongside Imperial's Faculty of Medicine. His outstanding record of leadership in academic medicine will take both institutions from strength to strength. Both share the goal of achieving world-class excellence in medical education and research, and their close alignment will help to realise the opportunities offered by this exciting partnership between two world-class universities.'

Professor Bertil Andersson, President of NTU, said Professor Kelleher's experience in translating medical research into new diagnostics and treatments for patients will complement NTU well, as it has a strong track record in biomedical engineering.

'Together with Professor Stephen Smith, the Founding Dean who will now focus on driving research at NTU as Vice-President of Research, NTU will greatly influence the next generation of doctors and biomedical innovators here in Singapore. To have great impact in healthcare breakthroughs, we will need to train patient-centric doctors and innovators with multi-disciplinary expertise who are at the forefront of medical technology.'

Professor Kelleher said, 'The School has ambitious goals to redefine both medical education and research. Hundreds of people at Imperial, NTU and in partner healthcare organisations have already contributed to its development, creating a curriculum and infrastructure that will offer students an exceptional medical education. It will be a privilege to work with this dedicated team to set the direction for the School's research strategy and prepare to begin training a generation of outstanding doctors to serve Singapore.'

The Chairman of the Pro-Tem Governing Board of LKCMedicine, Mr Lim Chuan Poh said, 'We congratulate Professor Dermot Kelleher on his appointment as Principal of the Faculty of Medicine in Imperial College and welcome him as the concurrent Dean of the Lee Kong Chian School of Medicine. His illustrious career has been characterised by remarkable achievements in medical education and research, and outstanding leadership. I'm confident his appointment will continue the stellar work of the School's Founding Dean, Professor Stephen Smith, whom we thank for laying the strong foundations of the school.'

The above article was adapted from a press release issued by NTU's Corporate Communications Office

In Brief

Faculty Development for Team-Based Learning

For one week, between July 23rd and July 27th, the school organised a series of Team-Based Learning (TBL) seminars conducted by one of the pioneers of TBL, Professor Larry Michaelson. The seminars were attended by LKCMedicine's faculty leads, as well as key healthcare professionals from the School's partner institutions.

A Sharing Session with Parents

The School's leaders and staff had a meaningful time interacting with parents of prospective medical students during LKCMedicine's *Sharing Session with Parents* on August 3rd and 4th. Parents learnt about the school's ethos and plans and asked questions about the curriculum, admission, fees, scholarships, faculty and teaching approach.

Overseas Delegates Visit LKCMedicine

On June 29th, the School hosted a visit by senior healthcare officials from developing countries including African, Middle Eastern and South Asian nations. The visitors got to hear about LKCMedicine's MBBS programme, research initiatives and the school's role in Singapore's healthcare landscape.

Tips on Running a Medical School

A seminar for healthcare professionals titled *Running a Medical School* was held at LKCMedicine on August 1st. Presenters from Imperial College London, Professor Jenny Higham who is the Deputy Principal of the Faculty of Medicine and Professor Karim Meeran, the Deputy Director of Medical Education, gave tips on how to manage the affairs of a large medical school.

LKCMedicine Holds Groundbreaking Ceremony

The Lee Kong Chian School of Medicine (LKCMedicine) held its groundbreaking ceremony on May 28th 2012, taking a concrete step in realising its mission of training future-ready doctors by tapping on the strength of its two parent universities, Imperial College London and NTU.

Presided by Minister for Health Mr Gan Kim Yong, and Minister for Education Mr Heng Swee Keat, the ceremony was held at the Mandalay Road site opposite the Tan Tock Seng Hospital, where the School's Novena Campus is being built. The site is historic, because, that is where a hostel for medical students was built in 1924. The former hostel has been identified for conservation and is currently being restored for use as the school's headquarters.

The School's high-rise Clinical Sciences Building (CSB) will be situated in front of the headquarters. To be equipped with administrative and teaching facilities, the headquarters building will be ready by June 2013, in time for the first intake of 50 students in August 2013. The CSB is expected to be ready in 2015.

Plans for a dual campus were also unveiled at the ceremony. LKCMedicine's Experimental Medicine Building (EMB) will be built at NTU's Yunnan Garden Campus. This will create synergy with NTU's engineering, scientific, business, and medical disciplines and complement the practical clinical training offered at the Novena Campus.

Located within NTU's biomedical-engineering cluster, the building will have a link to the



School of Biological Sciences to facilitate collaboration and partnerships between researchers and students from both schools. The EMB is projected to be completed in 2015.

Together, the school's buildings will house seminar rooms, learning studios, clinical skills training facilities, innovatively-designed laboratories and other teaching and recreational facilities. Students will spend time training in well-equipped, state-of-the-art and technologically advanced learning environments. The buildings are designed to promote collaboration among students, faculty and clinicians through the use of multidisciplinary and interactive spaces and facilities.

Mr Heng said, 'This new school will allow Singapore to further diversify our higher education landscape, and create more opportunities for Singaporeans locally. With

more diverse and exciting opportunities available for a local medical education, I believe that more Singaporeans will choose to study medicine in Singapore and contribute to Singapore's healthcare sector thereafter.'

Mr Gan said, 'The Lee Kong Chian School of Medicine, with the National Healthcare Group as its primary clinical partner, will play a pivotal role in adding to the capacity to train and develop doctors to meet our healthcare needs in 2020 and beyond. Our challenge does not end there. Beyond training enough doctors to meet our needs, our medical schools must also train doctors equipped with the skills to care for us in an evolving healthcare landscape.'

The above article was adapted from a press release issued by NTU's Corporate Communications Office

A Taste of Good Medicine

For the first time in Singapore, 600 students aspiring to be doctors were given the chance to see trauma surgery 'live' without having to step into a hospital.

On June 30th 2012, the Lee Kong Chian School of Medicine (LKCMedicine) presented a lecture-cum-demonstration by Professor Roger Kneebone, a world famous expert in the use of simulation in medical education. Professor Kneebone, a professor of surgical education at Imperial College London, and his team, showed students how simulation technology is used in teaching surgery and medicine.

The event held at the Genexis Theatre at Fusionopolis featured Professor Kneebone's invention, the 'igloo', manned by a team of surgeons, computer scientists and prosthetic artists from Imperial College London. The igloo is a low-cost inflatable operation theatre, which resembles an actual surgery setting. For the demonstration, an actor playing an accident victim was wheeled onto stage and moved into the igloo.

Professor Kneebone's team then used human organ prosthetics and simulated blood to

re-create a situation that looked and felt as if real emergency abdominal surgery was taking place. As the surgery progressed, students heard commentary explaining what the surgeons were doing at each point in the operation.

Medical simulation allows students to train in circumstances very similar to real-life clinical encounters with patients. The one-day event gave students the chance to experience first-hand, the effectiveness of simulation in training medical undergraduates.

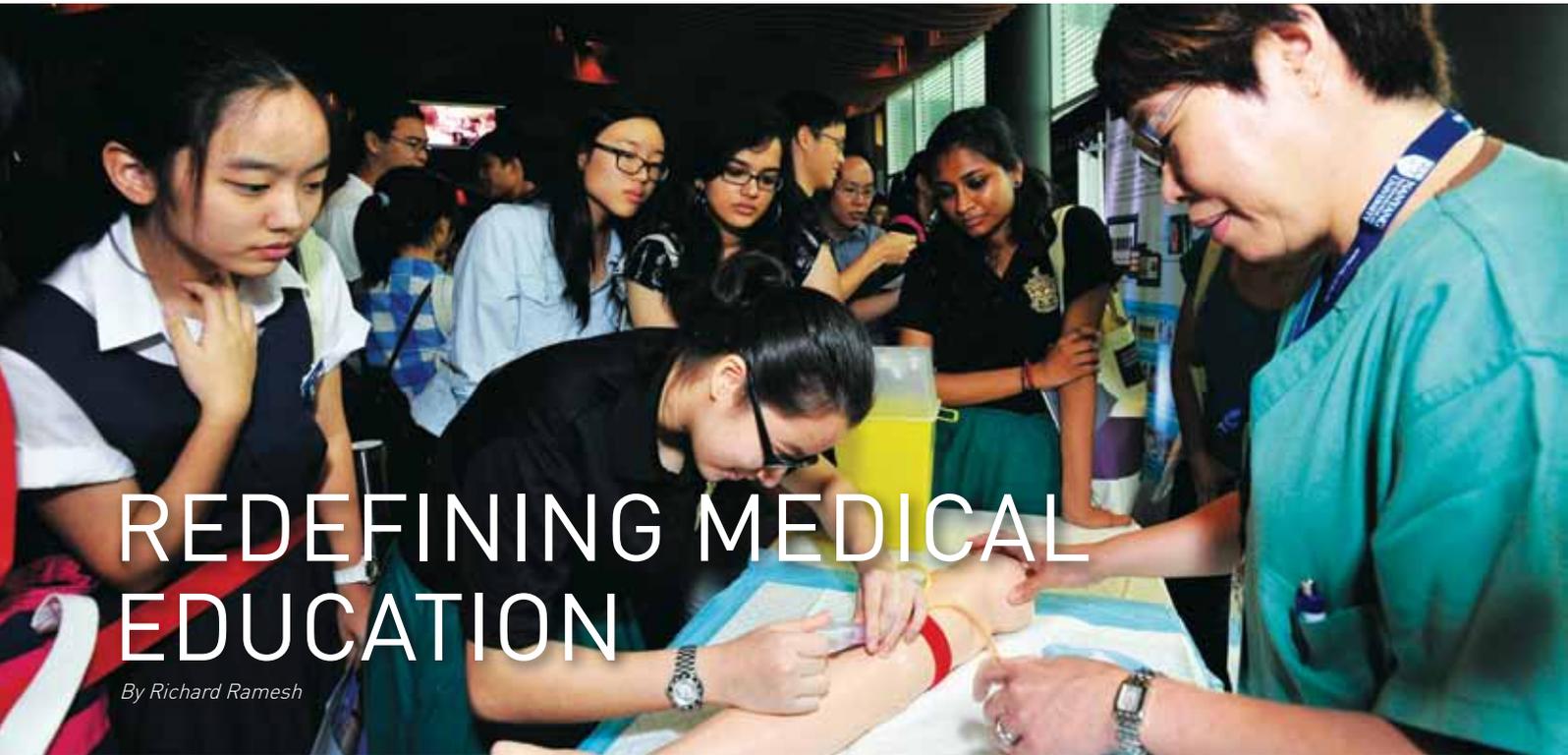
Outside the theatre, students tried their hand at venepuncture, the process of surgically puncturing a vein to draw blood, performed cardiopulmonary resuscitation (CPR) on a mannequin and had a go at surgically mending cuts and wounds made of latex – all in the name of experiencing the realism of medicine.

'Medical simulation captures a particular aspect of medical care and takes it to a place where people can practise and work on their skills with supervision and guidance. Sufficiently authentic simulation can give you the heart-racing feeling you experience when



things do start to go wrong, and allows you to practice strategies for coping when the unexpected occurs,' Professor Kneebone said.

Professor Kneebone's lecture-cum-demonstration is the first of LKCMedicine's Inspirational Lectures, designed as a series helmed by illustrious speakers and experts from around the world, aimed at inspiring Singapore's best students to pick medicine as their top choice of study.



REDEFINING MEDICAL EDUCATION

By Richard Ramesh

For the past two years, some of the best minds in the fields of medicine, medical education and the administrative service have come together to build, from ground up, a world-class medical school for Singapore.

The Lee Kong Chian School of Medicine (LKCMedicine), founded in 2010 on a partnership between Imperial College London and NTU, will welcome its first batch of medical undergraduates in August 2013.

Starting LKCMedicine in the twenty-first century offers a rare opportunity to redefine the way doctors are trained. It is an enormous responsibility that has important implications for medical care worldwide. The School wants to train doctors who will have a sterling command of medical knowledge and the ability to translate that into meaningful and compassionate care for patients.

Undergirded by the support from LKCMedicine's parent universities, especially the support from NTU's President Professor Bertil Andersson and Imperial College London's President and Rector Sir Keith O'Nions, LKCMedicine's academic and administrative leaders and staff have dedicated themselves to building the School's cutting-edge curriculum and infrastructure.

The School's Senior Vice Dean Professor Martyn Partridge, who is also Professor of Respiratory Medicine at Imperial College London, says that LKCMedicine's graduates will be 'instantly recognisable' around the world because of their overt professional competence and their approach to patients.

'We are here to produce doctors, and while technology is changing medicine, the reality is that medicine still depends very much on one-to-one relationships between patients and doctors. A patient-centred approach

that acknowledges the importance of shared decision-making between doctor and patient is the only satisfactory and cost-effective way of offering modern medical care,' Professor Partridge says.

The School also recognises that good healthcare involves care rendered by the most appropriate healthcare professional, at the right time and in the right setting.

'Students will thus learn that good care can be delivered in a rehabilitation centre, the patient's home, a step-down care centre, a family medicine clinic, or a hospital. We are redefining medicine and transforming healthcare such that we produce graduates for the new integrated healthcare systems that Singapore is building,' Professor Partridge explains.



Professor Partridge answers questions from students about LKCMedicine.

Modern medicine is vast and multifarious. Scientific knowledge about the human body, diseases, drugs and therapeutic devices has burgeoned and become more intricate, health care systems have evolved in complexity and patients today are well-informed, affluent and demand better care. Medical students have to be trained to navigate this complicated medical terrain. LKCMedicine has tapped on the strengths of NTU and Imperial to create a medical programme that is relevant,

stimulating, and most importantly, capable of nurturing competent, confident, caring and ethical doctors for Singapore.

'I believe that the practice of medicine begins with the training of medical undergraduates and I feel privileged to be part of the team that can help to define it,' says LKCMedicine's Chief Operating Officer Dr Lionel Lee.

'There are new things going on in medicine. In this day and age every doctor must understand the usefulness of technology, bioengineering and biomedical engineering in the diagnostics and therapeutics of medicine,' Dr Lee explains.

He adds that NTU's and Imperial's technological background will give students at LKCMedicine 'early inroads' in appreciating how technology can be utilised to give patients high-quality medical care.

The innovations in LKCMedicine's medical programme are many. First, there will be extensive use of simulation to recreate real-life situations that doctors are confronted with in clinical practice. Students at the School will practice their clinical skills by interacting with professional actors playing the role of patients. For example, they will practice taking the patient's medical history, learn how to deal with a patient who is distressed and how to handle questions on sexuality, in a simulated setting. Their interaction with simulated patients will be viewed and analysed by a tutor seated on the other side of a one-way mirror. After being debriefed about their performance, students will be given a video of the session for them to brush up their skills. They will also practise their surgical skills on simulated patients wearing realistic looking wounds made of latex. For instance, they will practise keeping patients calm while suturing their wounds.

'The idea behind simulation-based training is to allow our students to practise their skills in a safe setting. By "safe" I mean that there is no risk of hurting or upsetting a patient. This allows students the opportunity to try out new skills and become both confident and competent before they are asked to apply these skills with real patients,' says Dr Tanya Tierney who is Assistant Dean, Head of Clinical Communication and Simulation, and Head of Student Welfare, at LKCMedicine.



Dr Tierney shows what a session with a simulated patient would look like.

Another innovation at the School is its construction of medical education around clinical scenarios, so that students immediately see the relevance of the science they learn to the treatment of patients.

Professor Partridge illustrates how this will work. Instead of going to an anatomy class on coronary artery circulation followed by an afternoon lecture on thrombosis, students first see a patient with angina, view the patient's coronary angiogram, notice how a blockage in the right coronary artery causes the inferior surface of the heart to pump abnormally, and then go to the anatomy lab to look at coronary circulation in detail, after which they immerse themselves in a team-based learning session on thrombosis.

LKCMedicine's emphasis on early exposure to real clinical care, is also unique. Students will encounter patients in clinical settings as early as the first year of their studies. LKCMedicine's main clinical training partner, the National Healthcare Group (NHG), and other hospitals in Singapore will provide students ample opportunity for clinical exposure.

Associate Professor Tham Kum Ying, who is the School's Assistant Dean, the Head of Phase 2 and 3 of Medical Education, and the Lead for Emergency Medicine, says that the range of clinical venues and institutions within NHG is eminently suitable for the training of medical students. 'Tan Tock Seng Hospital is the top teaching hospital as nominated by our current medical students. That is a record we intend to keep because it signifies that the doctors inside here really take teaching as seriously as their commitment to clinical service,' says Associate Professor Tham.

The School has also aligned the way it will teach medicine according to how tech-savvy students of this millennium take in information. Young people are familiar with the latest web tools and social networking platforms and are well aware that they can get high quality videos on possibly any subject they google. Education has to be

made palatable for them, or risk becoming inane. So, the School will have fewer lectures and more collaborative learning sessions. Instead of devoting precious course time to lectures, which Professor Partridge describes as 'poor methods of passing information', a diversity of engaging and evidence-based teaching methods will be used. These include case-based seminars, team-based learning, apprenticeships and case demonstrations, all of which will captivate students' interest and help them retain the science they learn.

LKCMedicine's campus buildings in Novena and Yunnan Garden will have spaces and rooms conducive to collaborative learning and interaction among students, tutors and scientists. Learning studios, alcove clusters, seminar rooms, clinical skills training suites and practical laboratories are among the spaces that will be built to support the school's pedagogy. 'The priority is to ensure that the experience that students have in the teaching environment will be something that is inspiring for them,' says Dr Lee.

LKCMedicine's Director of Infrastructure and Resources Chan Wei Chuen agrees.

'The School's infrastructure is a key enabler for the provision of an excellent medical education. It also sets the scene for world-class research to take place. My aim is to create a milieu that will nurture students to grow into confident doctors with a heart and to inspire scientists to push beyond the current boundaries of medical research,' Chan says.

The School's adroit use of technology to aid learners is another innovation. It will use iPads as the main platform for the delivery of the curriculum. Students will be issued iPads, which contain their timetable, assessments and e-learning materials. This means, they will be able to refer to their content wherever they are and hence optimise their use of time. For example, they will be able to view videos of practical procedures on their way to the wards where they will witness those procedures done in a real-life clinical setting.

Even the way students are selected to pursue a degree at LKCMedicine is fresh. Besides their academic qualifications students will be admitted into the School based on their performance in the BioMedical Admissions Test (BMAT) and the Multiple Mini Interviews (MMI).

Associate Professor Michelle Jong, who is Lead for Critical Appraisal, Lead for Endocrinology, and Admissions Advisor, at LKCMedicine says that the BMAT and MMI are not meant to make life difficult for students who already have a heavy workload. 'The BMAT will help us select the students who will best be able to cope with the demands of medical school. Imperial College London has used BMAT as an assessment tool for a long time. Students who do well in BMAT have a higher chance of coping with the academic rigours of medical school. The Multiple Mini Interviews, on the other hand, are used in selecting students with the personality, skills and attitudes required of a doctor,' says Associate Professor Jong.

LKCMedicine will also pay special attention to providing excellent student support. 'We want students to feel valued and supported at LKCMedicine. By caring for our students we are also modelling to them the way in which we hope they will care for their patients,' says Dr Tierney.

She elaborates that each student will belong to one of five houses, supported by three tutors with whom they meet every few weeks for group and individual meetings. The houses will provide students with a sense of belonging, as well as academic and pastoral care support. Frequent meetings with tutors and close monitoring of progress and welfare issues will allow students with problems to seek and be offered assistance at an early stage. This will prevent students from becoming anonymous and slipping through the cracks when they have difficulties.

Senior Assistant Director for Student Life and Services, Renay Taylor, believes that such strong support for students will inspire them to be supportive to their patients' needs when they become doctors.

'There is no longer a place in healthcare, or at least from the patient's perspective, for hierarchical doctor-centred approaches to care. By emphasising to our faculty and staff the importance of being good role models to students we hope that we'll be able to inspire students to be truly patient-centred when they go out to work as doctors,' says Taylor.

Primacy of the patient's welfare is the cornerstone of the medical profession. Modern medicine's torrent of diagnostic and therapeutic options and complex healthcare delivery systems often confound and have an alienating effect on the ailing patient. The role of the physician as an expert advisor and guide is therefore an important one.

'With the correct selection of medical students, and an innovative course with significant attention paid to supporting the student, the School will be able to produce graduates with attributes as doctors that will be recognisable and distinctive,' Professor Partridge states.



Novena Campus



Yunnan Garden Campus

Powering Up Research

By Dr Andrew Ang and Dr Ng Sean Pin



Medical schools are not started often. When they are, much is expected of them. LKCMedicine's parent institutions, Imperial College London and NTU are both powerhouses of research. While the primary objective of the school is to produce doctors, it is only natural that eyes will be peeled to see what contributions the School will make in the area of translational and clinical research.

Research and Development is an important component in Singapore's economic strategy. It is a source of innovation and value creation. According to the Research Innovation and Enterprise (RIE) 2015 plan, the Singapore government set aside S\$16.1 billion worth of investments in research and development for the years 2010 to 2015*. The government aims to increase the Gross Expenditure on Research and Development (GERD) to 3.5 per cent of GDP by 2015. Singapore is also expected to continue building up its base of clinician scientists and strengthen its core capabilities in translational and clinical research to bring laboratory discoveries from the bench to the bedside.

With this broader national research drive in mind, LKCMedicine has worked toward putting in place the conditions necessary for

leading-edge research to take place in its laboratories.

The School has identified research areas it expects to achieve excellence in. They are: neuroscience and mental health, metabolic disease, infectious disease, bioengineering including structural biology, and health services outcome research.

We have also established programmes to develop human capital in order to nurture a cadre of biomedical and clinical research scientists at the School. The main responsibilities of these scientists will be in leading translational research, offering clinical care to patients as well as conducting instructional programmes.

Clinician scientists have unique and integrated perspectives that arise from their understanding of disease processes and basic biology. These perspectives are critical in setting the direction of translational research, teaching, and in investigating and addressing biomedical questions. It is our hope that the School's efforts and ambition in research will help create an enterprising scientific culture that will lead to innovations that achieve clinical and commercial success.

LKCMedicine and its healthcare partners have established the LKCMedicine Clinician Scientist Fellowship, which aims to develop clinician scientists by providing them with a professional route, in which, they can

progress from clinical residency to PhD training, postdoctoral experience and subsequently to appointment jointly as a Clinician Scientist at LKCMedicine and as a doctor with our main healthcare partner, the National Healthcare Group. The Fellowship will be awarded to promising, young clinicians who have the potential and aspiration to become leading researchers in their field.

Another programme the School has introduced to develop research talent is the LKCMedicine Postdoctoral Fellowship. This Fellowship aims to nurture talented young scientists while providing them with a stepping stone to develop their career by offering them a tenure track position in the School.

The LKCMedicine Postdoctoral Fellowship is exclusive to the School and will significantly enhance the School's research profile and branding in the near term. Being a new school with ambitions to see its research efforts bear fruit in a short span of time, the LKCMedicine Postdoctoral Fellowship is useful because it is instrumental in providing a prestigious fellowship from the outset to attract young and outstanding researchers to the school.

**STEP 2015 Science, Technology & Enterprise Plan 2015 Published by: Agency for Science, Technology and Research (A*STAR), May 2011*

New Ways to Teach Anatomy

By Dr Dinesh Kumar



Being a teacher and a scientist, nothing gives me more pleasure than the act of investigating the mysteries of science and using the knowledge uncovered to enrich the minds of students.

As Lead for Anatomy and Head of Examinations for Phase 1 at the Lee Kong Chian School of Medicine (LKCMedicine), I have had the opportunity to use research to enhance the way students are taught the human anatomy.

The volume and complexity of medical information have increased in recent years. Medical schools all over the world face the challenge of having to deliver content in fresh and fascinating ways, so that students are able to absorb, retain and apply that information with ease.

In collaboration with Fraunhofer Interactive Digital Media (IDM)@NTU, a research centre for visual computing, the School has developed an interactive learning software that enables students to learn about the human anatomy through pop-up labels and videos.

The software, which will be installed on iPads issued to students, makes use of augmented reality (AR) technology to trigger the appearance of informative slides and videos on the iPad screen, when the iPad is pointed to real-world objects that have been pre-designed to respond to the AR software in the iPad.

As a learning tool for anatomy, this is how it works: Students simply point their iPads at anatomical charts and models in front of them and pre-stored videos and slides pop up on the students' iPad screens presenting information about the particular organ or anatomical region that they have pointed their iPads to. If they want more details about the anatomical structures presented, they can click on the tabs and labels on their screens and delve deeper into the topic. The software appeals to the curiosity of students, allows them to interact with the material presented and increases the chances that they will retain the information they learn.

The software is not an exhaustive repository of anatomical information. Hence, it has been developed, thus far, only as a supplementary learning tool that will accompany the broader anatomical education that students will

receive at the School, much of it by means of team-based learning and in conjunction with radiologists and surgeons.

The high level of technological support available for learners today has made it inexcusable to deliver content using age-old methods of lectures, and textbooks with page after page of text and two-dimensional diagrams. Medical students today come from a cultural context steeped in fast-paced and media-rich communication. Their enquiring minds will not be satiated by old-fashioned teaching methods. I am happy to say that anatomy teaching at LKCMedicine is keeping up with the times.



Shaping a Top-Notch Curriculum

By Dr Naomi Low-Bear



The Lee Kong Chian School of Medicine (LKCMedicine) aims to train doctors who will be able to meet Singapore's future healthcare needs.

Graduates of LKCMedicine will be caring, professionally competent and skilled in life-long learning. They will have the potential to practise at the highest standards – both individually and in teams – in academic, hospital and community settings.

The structure of the curriculum is novel. The clinical presentation modular structure of Phase One (Years 1 and 2) will facilitate an appreciation of the clinical relevance of the basic sciences, while the pre-rotation teaching blocks in Phase Two (Years 3 and 4) will be an opportunity to enhance knowledge and understanding of the scientific basis of clinical practice. The result will be a highly integrated programme of study with a strong foundation in both basic science and clinical practice.

Clinical skills are learned from the start of Year 1: the Integrated Clinical Practice Course is taught throughout the programme. It consists of three components: *Clinical Communication*, *Clinical Methods* (history-taking and examination) and *Practical Skills*. Teaching will be conducted in small groups through tutorials, clinical teaching and simulation, with extensive involvement of simulated patients. Through the *Long-term Patient Project*, where pairs of students are allocated to a patient with a chronic condition, students will learn to appreciate health and social care from the patient's perspective.

Courses related to the scientific basis of medicine will be taught through team-based learning (TBL). In contrast to a more traditional lecture-based approach, TBL places the student at the heart of the learning process. It encourages students to think more deeply, improves their recall of content, and enhances communication, team working and critical thinking skills.

Currently, the Imperial curriculum team is concentrating on developing materials for TBL sessions. TBL preparation materials will include a mixture of videoed and narrated PowerPoint presentations, lecturer interviews and e-learning modules, all of which the students will access via their iPads. Multiple-choice questions for the TBL sessions will be aligned with the content of the preparation material and the course learning outcomes.

A team of over 40 people have been involved in the development of these materials. Our curriculum review panel ensures that the materials are of a high standard and that feedback received from colleagues in Singapore has been addressed. A new curriculum takes time to develop, but with a talented group of educators in both Singapore and London, we are confident that the course materials will be of the highest quality.

The Tech Touch in Medical Education

By Paul Gagnon



The Lee Kong Chian School of Medicine (LKCMedicine) is using technology to make lessons more engaging and captivating for students.

Students no longer have to bear with boring lectures.

Videos and interactive presentations communicate complex ideas far better than long speeches.

The E-Learning and IT Services unit (unIT) is collaborating with technology innovators within Singapore and around the world to develop a state-of-the-art and media-rich mobile learning experience so that medical students at LKCMedicine receive the best learning experience that technology can offer.

We are using the latest online learning technologies to ensure that students have 'just-in-time', uninterrupted, and targeted access to their learning materials, activities and resources, whether they are on campus, or traveling to healthcare sites for their lessons. Partners in this process include Imperial College London, the University of Sydney Medical School, and Leeds Medical School in the UK.

Delivering medical education on a technological platform gives us a chance to make teaching more effective. Instead of large groups of students assembling for lectures, taking notes, or dozing off, the emphasis now is on technology-enabled self-directed learning and team-based learning (TBL).

Students will be issued iPads on which they can access all their e-learning materials.



Students using iPads at LKCMedicine's Open House on March 10th.

They will have access to a rich repository of digital learning content and virtual learning spaces in which they can tap on technological resources and easily identify those they consider most appropriate for their learning. They will also be able to track their progress in meeting their learning outcomes, and view these results as they progress through the different subject areas.

A behind-the-scenes view of how the TBL learning materials have been put together will illustrate how we have used technology to support TBL. The foundational learning materials of TBL – in the form of narrated PowerPoints and video recordings – have been prepared by content experts from Imperial. The E-Learning Unit has converted these learning materials into an e-book and has tagged this e-book as 'Learning Resources' within a well-defined learning activity sequence, consisting of online and highly interactive face-to-face activities.

These targeted sequences will be deployed online within a customised medical learning management system and made accessible through the system's learning calendar. All students will experience the full advantage of the online learning space through their customised iPad apps.

The innovative use of technology to support the learning of trainee doctors is the hallmark of curricular design and delivery at the School. The curricular experience at LKCMedicine, which leverages on advances in mobile learning, continually evolving capabilities of customised learning management systems, and the latest content development, delivery and evaluation tools, promises to be one of the most cutting-edge learning experiences available in medical education today.

Building a Legacy of Giving

By Suzanne Lim



Even before admitting our first cohort of students in August 2013, the Lee Kong Chian School of Medicine is privileged to be the beneficiary of great generosity.

The gifts from our early benefactors are a resounding testimony of their belief in the Lee Kong Chian School of Medicine (LKCMedicine). These gifts equip us with precious additional resources in our mission to nurture a new generation of doctors to address Singapore's chronic shortage of physicians, and future healthcare challenges.

In January 2011, the Lee Foundation made a landmark gift of \$150 million to the School. In recognition, the School was named the Lee Kong Chian School of Medicine, after the founder of the Lee Foundation, renowned business tycoon and philanthropist, Tan Sri Dato Lee Kong Chian.

Half of the Lee Foundation's gift will be used to establish an endowment for student financial

aid in the form of bursaries, scholarships and other types of financial aid. The other half of the Lee Foundation's gift will go into establishing an endowment to advance medical education and research. Initiatives in the pipeline include undergraduate merit scholarships to attract the brightest students to LKCMedicine, as well as postdoctoral fellowships to support the work of promising medical research talent in Singapore.

In December 2011, we received a gift of \$1.96 million from the Renée Parrish Trust. Renée Parrish (1908 – 2005) was the widow of Ivor Edward Parrish (1905 – 1990), a chemist who had wanted to study medicine but was unable to do so. Before her passing in 2005, Renée expressed a desire to establish a trust fund in Ivor's memory to provide financial assistance to medical students, a wish now fulfilled with the establishment of the E I Parrish Trust Bursary Fund at LKCMedicine.

We are truly grateful for such tremendous support and generosity that have sown the seeds for a legacy of giving at LKCMedicine.

Be a part of our legacy of giving. To explore giving opportunities at LKCMedicine please contact Suzanne Lim at suzanne.lim@ntu.edu.sg or +65 6592 1784.

'Singapore needs more doctors – the number produced each year is not enough. Recruitment of foreign doctors has also not quite solved this problem. At the Singapore Medical Association's recent anniversary dinner, Mr Lee Kuan Yew shared that out of the 10,000 doctors we have, 2,000 are foreigners who neither speak the dialects nor the languages some of our older patients speak. The Lee Kong Chian School of Medicine, a partnership between NTU and Imperial College London, seeks to educate doctors who are not only well versed in the latest medical knowledge, but are able to translate this into the highest standard of care for their patients. By 2025, it will, together with the other two medical schools in Singapore, train 500 doctors a year, double the current number.'

– Lee Foundation, on supporting LKCMedicine

FROM THE LONDON OFFICE

A Medical School in the Making

By Paul Ratcliffe



On July 9th 2012, Principal of Imperial College London's Faculty of Medicine Sir Anthony Newman-Taylor, hosted an event to update colleagues on the latest news on the development of the Lee Kong Chian School of Medicine (LKCMedicine).

The event attracted over 120 people from Imperial's Faculty of Medicine and the wider College community. Also present at the event was Singapore's Deputy High Commissioner to the UK, Mr Stephen Quick.

The event commenced with guests enjoying an exhibition of posters about the curriculum, the infrastructure development, LKCMedicine's London office and research opportunities. They also watched two short videos – one, a

fly-through video of the new campus buildings showing some of the School's state-of-the-art facilities, and the other, a promotional video with commentary from some of the key stakeholders of Imperial College and NTU.

After Sir Anthony welcomed the guests, Professor Jenny Higham, who is deputy principal of the medical faculty and deputy director of medical education at Imperial, outlined the College's view of the project, emphasising the work that has been undertaken by the College and the huge number of people involved, which is to date, around 300. LKCMedicine's Senior Vice Dean Professor Martyn Partridge gave an overview of the progress to date. He outlined the curriculum's innovative structure and how supervised clinical experiences are integrated into the curriculum from the very beginning.

After the presentation and lively discussions, guests were treated to Singapore-style catering. They interacted with members of the London project team and Project Board and some of the academic staff who had contributed to the development of LKCMedicine's curriculum.



Mr Quick and Sir Anthony catching up.

IN THE SPOTLIGHT

Registration for BMAT Opens on August 15th

Students applying to the Lee Kong Chian School of Medicine (LKCMedicine) will have to sit for the BioMedical Admissions Test (BMAT), which is a two-hour, subject-specific admission test taken by applicants to medicine, veterinary medicine and similar courses at certain medical schools in the UK, including Imperial College London. As the LKCMedicine programme is a joint degree by NTU and Imperial, the use of BMAT for admission to LKCMedicine will ensure parity in student selection.

This year's BMAT will take place on November 7th 2012, with registration for the test opening on

August 15th 2012. Candidates in Singapore may register via two test agents working together with Cambridge Assessment: the SEAMEO Regional Language Centre (RELC) and the British Council in Singapore. Singaporeans, Permanent Residents or International Students who have recently graduated from or are currently attending a school within the Singapore school system are to register for the test with RELC (www.relc.org.sg). Those not part of the Singapore school system, are to register with the British Council (www.britishcouncil.org.sg/en/ielts-and-exams/cambridge-admissions-tests).

There is a range of resources available online at www.bmat.org.uk to help one prepare for BMAT, including a test specification, sample test papers, past papers, format familiarisation and suggested reading materials. There is also the official guide 'Preparing for BMAT', available at major bookstores and libraries, which provides useful information and materials needed to prepare for the test, including sample questions with answers and useful hints and tips.