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Department of Orthopaedics & Traumatology

Queen Mary Hospital

The University of Hong Kong Medical Centre

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Message from the Editorial Board

Our Division of Paediatric Orthopaedics has highlighted the management and advances of two common paediatric conditions in the lower limbs. The Sixth Hong Kong International Orthopaedic Forum will be held 25-26 Apr 2009. The theme is on Musculoskeletal Degeneration. For the first time, a concurrent session is arranged this year focusing on shoulder problems. Nevertheless, to make the Forum more educational and comprehensive, one whole week of satellite program is organized as well.

"Doc! My kid has knock knees"

Genu Valgum Management
Dr. A. Fok / Dr. M. To

Knock knees (genu valgum) mean that the knees angle in and touch each other when the lower limbs are straightened. Even though most of the knock knees are physiological, other causes should not be ignored.

Etiology

Bilateral:

1. Physiological (Idiopathic)
Most children from 2 to 8 years old develop some degree of knock knees, and 95% will resolve spontaneously. However, children > 8 years of age with persistent genu valgum may require correction if they develop gait disturbance, knee discomfort, patellar malalignment, ligamentous laxity and cosmetic concern.

2. Rickets
While nutritional deficiency of vitamin-D or calcium is rarely seen in Hong Kong, Vit-D resistant type is the commonest encountered in developed world. It is an X-linked dominant disorder which affects boys and girls equally.

3. Bone dysplasia, e.g. multiple epiphyseal dysplasia

Unilateral:

1. Tumour like conditions
Fibrous dysplasia, enchondromatosis (Ollier's disease) or focal fibrocartilaginous dysplasia of the distal femur have been reported to cause unilateral valgus deformity

2. Trauma

Previous proximal metaphyseal tibial fracture without an associated fibular fracture may cause valgus deformity. The exact cause is uncertain. Soft tissue interposition in the fracture, overstimulation of the medial physis or tethering of the lateral physis by intact fibula have been proposed.

3. Multiple Hereditary Exostosis
Osteochondromatosis can produce both unilateral or bilateral genu valgum. It is also associated with valgus ankle as a result of the shortened fibula.

9-year old boy with persistent genu valgum of both lower limbs. The intermalleolar distance (red arrow) is markedly abnormal.

Symptoms and signs

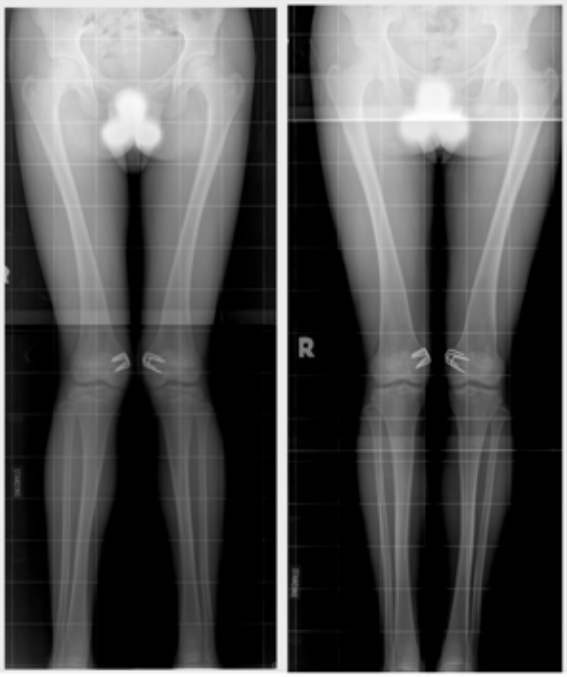
When the knees are touching, the feet and ankles are far apart. The gait may look awkward with typical circumduction pattern and requires the individual to swing each leg outward while walking. The patients may develop anterior and medial knee pain as well as patellar instability as a result of the angular deformity.

Treatment

The underlying etiology must be thoroughly investigated including blood tests and X-Rays. For those symptomatic patients with severe knock knees that persist beyond 8 years of age, surgical interventions should be considered. The effectiveness of bracing and physical therapy is questionable.

Surgical options:
1. Hemiepiphyseal Stapling* / Guided Growth Method*
2. Hemiepiphysiodesis* (closure of the medial half of the growth plate) of distal femur and/or proximal tibia
3. Corrective osteotomy of the distal femur and/or proximal tibia

* only for skeletally immature patients



The same patient above undergoing hemiepiphyseal stapling. Lower limb alignment i) 8 months post-op; ii) 3 years post-op showing gradual correction after stapling. The intermalleolar distance has significantly reduced.

Cutting Edge Development

New Advances in Limb Lengthening - A Totally Implantable Lengthening Device

Dr. M. To / Dr. W. Chow

The management of leg length discrepancy(LLD) varies from simple observation and shoe lift to complex surgical procedure. The treatment depends on the projected LLD, skeletal maturity, associated deformity, and patients' concern. Traditionally, discrepancy of less than 2cm can be treated conservatively, beyond that, shoe lift, orthosis or surgery should be considered. It is difficult to use the absolute figure in LLD as an indication for surgical intervention. In our hospital, we usually consider surgical intervention if the LLD > 3cm and patients are unable to tolerate orthosis or prosthesis.

Patient with external fixator for lower limb deformity and leg length correction

Limb lengthening is traditionally managed by using an external fixator as a gradual lengthener to lengthen the bone at a rate of 1mm/day. After distraction, the bone will require twice the time for consolidation. Hence, for a 4-cm distraction, the patient may require to put on the fixator for about 4-6 months. The drawback of the procedure includes high incidence of pin tract infection and unsightly scar on the limbs. The patients may also find it uncomfortable because of the bulkiness of the device. It will therefore be ideal to have an internal device to provide the distraction and to minimize pin tract infection. Blichnickovis is credited for being the first to design a totally implantable lengthening device.

The Duchess of Kent Children's Hospital is the first hospital in Hong Kong to use such intramedullary device to correct the leg length discrepancy. Since early 2007, we have successfully used this intramedullary device to correct LLD for selected patients. The device is implanted into either the femur or tibia via a small incision to the limbs. Through simple motion of the

Intramedullary Skeletal Kinetic Distractor (ISKD): Femoral (left) Tibial (right)

Leg length discrepancy causing unleveled joint line and pelvic obliquity

limb, the mechanical ratchet in the nail gradually distracts and lengthens the bone. The progress of the lengthening can be monitored by a handheld device and by serial radiographs. With such internally implanted device, our patients will not need to worry about pin tract infection or unsightly scar. They can also enjoy a more "comfortable" distraction process.

The device still has its limitation in correcting LLD. Patients with open physis, moderate to severe deformity in the limbs, or severely short limbs are contraindicated for such device. Similar to the use of an external fixator device, one should be aware of, premature consolidation, poor bone regeneration, surrounding soft tissue tightness, neurovascular injury, joint instability and fracture during the distraction or consolidation process.

Monitoring the lengthening using a hand-held machine by the patient

4cm tibial lengthening: Post-Op (left); 6 weeks (middle); 6 months (right)

Tips from our Allied Health

Hip Spica Care in Paediatric Patients

Nursing Staff of The Duchess of Kent Children's Hospital

Hip spica is commonly used after paediatric hip surgery. A hip spica extends from the lower portion of the thoracic cage to the toes and helps to immobilize the lower limbs in a satisfactory alignment. This includes:

1. Single hip spica
2. One and a half hip spica
3. Double hip spica

Since the patients usually need to put on the spica for a period of time (weeks to even months), proper padding, positioning of the hips and application of the cast are essential. The hips are usually held in flexion and abduction to ensure comfort during sitting and to allow perineal care.

Personal hygiene is very important. The spica must be properly trimmed at the edges to avoid skin impingement and adequate rooms for perineal care. In the front, the pubic area should be exposed adequately and the spica is trimmed on the side to expose the upper thigh just below the inguinal crease. At the back, the cleft of the buttocks must be well exposed to avoid soiling onto the spica. The edges should be trimmed to avoid impingement of the knees and ankles during motion.

Observe for cast syndrome including severe ileus is extremely important. Patients are usually given fluid diet in the first 24-48 hours. If necessary, a round-shaped abdominal window should be opened over epigastrium to accommodate fullness of stomach after eating.

Last but not least, prevention of pneumonia by sitting up the patients and regular chest physiotherapy should not be neglected.

Checking the front and back of the spica to ensure smooth margin in order to prevent skin irritation and sore

Patients are turned and able to move about in bed, or wheelchair

One and a half hip spica

The patient can sit comfortably even with the spica

Two diapers are used with the smaller diaper covering the perineal area, and a large diaper cover the hip spica. The bed is tilted up to avoid urine draining into the spica

A Chat with Dr. Chow Wang

Division Chief of Paediatric Orthopaedics

Kenny Kwan

"As a parent myself, I understand how the parents must feel, more importantly, I really like children and I love playing with them..."

What made you choose Paediatric Orthopaedics?

As a paediatric orthopaedic surgeon, one has to deal with all the different pathologies in the body which is different from other orthopaedic subspecialties as they are mostly based on certain anatomical sites or work on highly sub-specialized skills and I find this very challenging. It is unique in Paediatrics that you will establish a long rapport and relationship with the patients and their family, right from the first time you meet them until they are skeletally mature. The management of paediatric problems is not so "black and white", as there are different approaches to the same condition depending on the age they present to you, and this makes Paediatrics so interesting to me. I have become a parent myself, I understand how the parents must feel when they bring their children to the clinics, and it is very satisfying to be able to help them as well as their children through my work.

What difficulties do you see in doing Paediatric Orthopaedics in Hong Kong?

We now have a very low birth rate in Hong Kong, and so the number of children we are seeing on the whole is decreasing. At Duchess of Kent Children's Hospital (DKCH), we have enough patients which require two full time Paediatric Orthopaedic Surgeons to look after them, but this is probably not so in most other centres. Also, we are seeing a change in the disease pattern – we saw a lot of polio and TB at DKCH in the old days, then conditions like DDH and clubfoot are also on the decline, and now we are mostly treating developmental problems. In order to treat these patients more effectively, through the Paediatric Orthopaedic Chapter (POC), we are trying to gather the more difficult cases in certain hospitals, so different surgeons from various centres in Hong Kong can work and operate together, and their skills and expertise can be shared more easily. I think the future of Paediatric Orthopaedics in Hong Kong will move towards inter-cluster care. Actually, we are already working with other hospitals to see how we can combine our surgical experience, build up the volume load, and introduce some better quality research. We have started collecting some data on fracture management at the POC from different hospitals. We will catch up on some basic science research too.

What do you think is special about doing Paediatric Orthopaedics at DKCH?

We are not a big subspecialty in the department, but we have a long history in treating orthopaedic conditions in children, with a well-established and dedicated team of allied health professionals. We do mainly "cold" orthopaedic cases, but we also do our own rehabilitation for the patients. So we are a very self-contained unit and this gives us a lot of job satisfaction.

Recently, there is a new Hospital Chief Executive at DKCH, and we are discussing what direction we are going to take this hospital in terms of service provision and the needs of the public. We would like to explore the possibilities of having more specialties here. There is also a discussion about building a new children's hospital in Hong Kong which will look after the entire paediatric population in the territory. DKCH has been a centre of excellence with a long history in treating children, and I am sure we can play an important role in the planning of such facilities, and I have strong feelings that DKCH should remain as a specialized centre on its own rights.

What is hot and new in Paediatric Orthopaedics?

Unlike other orthopaedic subspecialties, development in Paediatrics is not as rapid because we are not particularly implant-dependent or market-driven. In general, we are not desperately in need of some innovative implant designs for our surgeries. But with improvement in the understanding of basic science, human anatomy and pathology of some diseases, new surgical ideas like surgical dislocation of the hip and osteotomy at the femoral neck has slowly emerged in the past decade. This, I would say, is much of a "forbidden" surgery ten years ago. Locally, we have started to perform such surgery in Hong Kong - subcapital realignment surgery on femoral necks. In fact, we can proudly say that we are the first to perform such surgery in Hong Kong. Our patients have benefitted a lot through such innovation. This is a relatively new and technically demanding procedure which deals with a lot of the intra-articular hip pathologies with a reduced risk of avascular necrosis. I'm sure we would hear more about it in near future. New advances and more sophisticated gait analyses in neuromuscular diseases have totally changed the understanding and management of many neuromuscular diseases especially cerebral palsy. To adapt to these new changes, we are going to upgrade our Gait Laboratory this year.

What do you enjoy doing after work?

I enjoy listening to classical and vocal music, and I try to attend a concert once or twice a month! Both my daughters play musical instruments, so we try to make it a family outing to watch some performances once in a while. I used to play a lot of football, particularly with the fellows at DKCH, but now I spend more time with my own children!

What advice do you have for young surgeons who want to pursue a career in Paediatric Orthopaedics?

It takes a much longer time to become a mature paediatric orthopaedic surgeon than other subspecialties, because the subject matter is so broad, there are so many controversies in the treatment, and even for the same condition, there are different management strategies depending on the age the child presents to you. Take myself for example, I think it has taken me at least 7 or 8 years after taking up Paediatrics before I feel confident in performing majority of the procedures. So you need to be very patient with your training. Also, the process of learning to make the right decisions of when to do what on your patients takes a long time to build up, especially in neuromuscular conditions where you will have a series of operations to do, and one decision affects the next. You also need to be thorough and repetitive in your examination and evaluation, because a lot of kids are not very co-operative when you first see them, and they can be quite inconsistent sometimes. It is also important to be humble and listen to what others have to say. The input of our allied health professionals can be invaluable in the management of our patients, and if you start ignoring the advice you get, then you will start running into trouble.

AO Course for Surgeons

Advances in Lower Extremity Complex Trauma and Reconstruction 13-15 February 2009

Course Chairman: Dr. Frankie Leung

Consultant and Division Chief of Orthopaedic Trauma

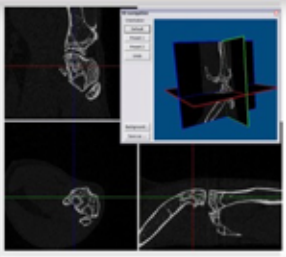
One of the most important annual trauma events in Hong Kong, the AO course, was successfully completed on 15 February 2009. This AO course, started on 13 February, was designed to have two parallel courses for both surgeons and operating room personnel (ORP) running simultaneously. This year main theme was "Advances in Lower Extremity Complex Trauma and Reconstruction". Dr. Frankie Leung, the course Chairman, had invited several internationally well known trauma experts in the related fields, Prof. Micheal Baumgaertner of Yale University in USA, Prof. Jung-Jae Kim of Asian Medical Centre in South Korea, Dr. Congfeng Luo of Shanghai Sixth Peoples' Hospital in People's Republic of China and Dr. Alex Staubli of Cantonal Hospital in Switzerland. These experienced trauma surgeons, together with a group of dedicated local faculty members, shared their valuable experiences with the 50 participants through lectures, practical, discussions and cadaveric workshop. Lots of positive feedbacks and comments were received. After this year success, we are looking forward to the 2010 AO course.

Orthopaedic Research Centre

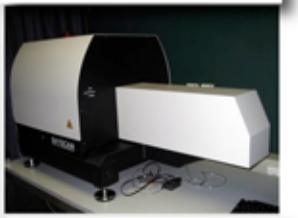
Chairman of Orthopaedic Research Centre: Dr. William Lu

Associate Professor

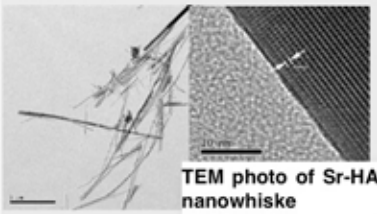
Our research has come a long way since the inception of the department in 1962. At the beginning, the main focus was on clinical research. Over the past 15 years, basic research has taken on increasing momentum. While the initial thrust was mainly in biomechanics, areas of interest have now expanded to involve biomaterials, molecular biology, genetics, bio-nano technology, and neurophysiology. To date, all clinical staff are involved in both basic and clinical research projects, and at any one time there are 35 postgraduate students and 10 post-doc and research fellows within the department. Our Research Centre is staffed by team members who strive for research excellence, probing for a better understanding for all aspects of orthopaedic related issues. Measures of excellence include the publication of over 100 peer-reviewed research articles in high quality journals, the establishment of over 15 patents, collaboration with industry in the development of surgical implants and biomaterials, success in securing external research grants, including four RGC grants this year, and continued interest of both local and overseas researchers to carry out research in our centre.



Three orthogonal reconstructed slices of mouse knee, 8.8um pixel size



Micro CT for live animal



TEM photo of Sr-HA nanowhiske

My Overseas Training

Dr. Cheung Wai Yuen
Associate Consultant
Division of Spine Surgery

Washington University School of Medicine, St. Louis, Missouri, USA

I started my overseas training in September 2008. My first visit was Washington University School of Medicine in St. Louis, USA. Prof. Lenke is a co-chief of their Spine Division and famous for spine deformity surgery. I followed his clinical activities for three months and have learned a lot. For example: pre-operative halo-gravity traction, thoracic pedicle screw insertion technique, direct apical de-rotation, quadrangular technique for placing pedicle screw in revision spine surgery, third-rod technique in closing spinal osteotomy, etc. His proficiency in surgical operations, devotion to patients, research and teaching were impressive.

Prof. Lenke and visiting surgeons from Egypt, Japan, Korea, Italy and Hong Kong

Kanazawa University, Kanazawa, Japan

Kanazawa University was my second stop. It is located at the central part of Japan, three hours away from Nagoya by train. Prof. Tomita and Prof. Kawahara are senior spine surgeons there. They were aggressive in treating spinal tumours. Certainly I seized a chance to observe a Total En-bloc Spondylectomy which was pioneered by this University. Their bloodless dissection, skills in passing the T-saw, handling epidural veins, dissecting epidural tumour from dura were amazing. Moreover, I had opportunities to observe cervical pedicle screws insertion which was also pioneered by Japanese. Their detail study of pre-operative CT scan, precision in putting in the pedicle probe and screws under image intensifier made this difficult surgery seemed easy.

Prof. Tomita and Spine Division members

Wooridul Spine Hospital, Seoul, South Korea

My third stop was Wooridul Spine Hospital in Seoul. Their Chairman is Dr. SH Lee and President is Dr. G Choi. I attended the 53rd International Minimally Invasive Spine Surgery Course and observed their surgeries. The minimally invasive spine surgery course was comprehensive including lectures and workshops covering endoscopic cervical and lumbar diskectomy, foraminotomy and inter-spinous spacer. They were aggressive in treating inter-vertebral disc herniations. I observed their surgery, including endoscopic lumbar and cervical diskectomies, transcorporeal cervical foraminotomies etc., their skills in needle placements for endoscopic procedures and manipulation of the endoscopic instruments were impressive.

Dr. SH Lee, senior spine surgeons in Wooridul Seoul Hospital and course participants from Austria, Japan, Hong Kong, Indonesia and Philippines

My Feelings after Overseas Attachments

My overseas training was worthwhile and fruitful. It opened my eyes to world famous, first class spine centers. Their devotion to patients, research and teaching; their self-discipline; their wonderful surgical techniques, not only gave me great inspirations but also directions for my future developments. It has broadened my knowledge in two ways, the "maximally invasive" way including ultra-major spinal deformity corrections and tumour excisions; also the "minimally invasive" way in dealing with common spinal pathologies. Last but not the least, it provided me great opportunities to establish friendships with spine surgeons all over the world. I enjoyed it very much. Certainly it is one of the most memorable experiences in my life!

6th Hong Kong International Orthopaedic Forum

The Musculoskeletal Degeneration

25-26 April 2009
Li Ka Shing Faculty of Medicine
The University of Hong Kong

The Hong Kong International Orthopaedic Forum is an official departmental annual event. The title this year is "***The Musculoskeletal Degeneration***".

Topics were chosen each year to help arouse the interest and awareness of health care professionals of all disciplines and to update the latest development in the field of orthopaedics. This compact two-day program will highlight the recent advances in the management of degenerative musculoskeletal diseases including hand arthritis, osteoarthritis of the knees, spine degeneration and rotator cuff arthropathy. Apart from our renowned local experts, we have also invited international experts, including Prof. Dieter Grob, Prof. Eiji Itoi and Prof. Arnold-Peter Weiss to share their experience in managing our aging population.

Early Bird Registration: **Before 28 Mar 2009**

For further information, please visit our website: www.hku.hk/ortho/ortho/6hkiof

Satellite Program of 6th HK International Orthopaedic Forum

A week of very comprehensive satellite program is arranged this year to further enrich our Forum. Apart from lectures, surgical demonstration and case discussion, a workshop focusing on shoulder arthroscopy will be organized as well.

Date	Program	Venue
22 Apr 2009 10:30am - 12:00pm	Clinical Case Conference Guest Lecture by Prof. E. Itoi: Approach to Painful Shoulder	3/F Lecture Theatre The Duchess of Kent Children's Hospital
23 Apr 2009 12:30pm - 5:00pm	Surgical Demonstration on Shoulder Arthroscopy in Beach Chair Position	Lecture Theatre 5/F Professorial Block Queen Mary Hospital
23 Apr 2009 5:00pm - 5:30pm	Guest Lecture by Prof. E. Itoi: Shoulder Surgery - From Open to Arthroscopic Surgery	Lecture Theatre 5/F Professorial Block Queen Mary Hospital
24 Apr 2009 6:00pm - 7:00pm	Guest Lecture by Prof. A. P. Weiss Co-organization: HKSSH Innovation in Hand Surgery	Hong Kong East Cluster Training Centre for Health Care Management & Clinical Technology Pamela Youde Nethersole Eastern Hospital
25 Apr 2009 11:30am - 5:00pm	Concurrent Session of 6th HK International Orthopaedic Forum Shoulder Arthroscopy Cadaveric Workshop Instructor: Prof. E. Itoi	Lecture: Seminar Room 1, Laboratory Block Cadaveric Workshop: Wet Lab, Department of Anatomy 2/F Laboratory Block Li Ka Shing Faculty of Medicine
27 Apr 2009 5:00pm - 6:00pm	Spine Seminar by Prof. D. Grob 1) Intra-operative monitoring in spine surgery 2) Biomechanics of cervical spine 3) Posterior elements in degenerative cervical spine	Hong Kong East Cluster Training Center for Health Care Management & Clinical Technology Pamela Youde Nethersole Eastern Hospital
29 Apr 2009 10:30am - 12:30am	Guest Lecture by Prof. D. Grob 1) Registries and documentation 2) Complications after spine surgery - view from the patient 3) Failed spine surgery	3/F Lecture Theatre The Duchess of Kent Children's Hospital

*Separate registration and payment are required

Announcement

We continue to excel our talent and have been highly recognized locally and internationally.

Congratulations

Prof. K Luk (left) receiving the award from Prof. SP Lee (right)

Professor KDK Luk has won the Faculty Outstanding Research Output Award for his paper "Intervertebral disc transplantation in the treatment of degenerative spine disease: a preliminary study" in Lancet

Ms FPS Mok, Dr D Samartzis, Dr GE Caulian, Professor KDK Luk and Professor KMC Cheung of the Department of Orthopaedics & Traumatology, **Dr DYT Fong** of the Department of Nursing, and **Professor J Karppinen** of the Institute of Clinical Sciences, University of Oulu, Finland had won the Arthur Yau Best Clinical Paper Award and the Best Spine Paper Award in the 28th Annual congress of Hong Kong Orthopaedic Association for their paper "Schmorl's Nodes of the Lumbar Spine: Prevalence, classification, and associated risk factors"

Dr KC Mak, Dr Vidyadhara S, Dr Tarek El Fiky, Dr YW Wong, Professor Keith DK Luk and **Professor KMC Cheung** had won the Most Promising Spine Scientific Paper Award in the 28th Annual Congress of Hong Kong Orthopaedic Association for their paper "Supine Radiograph Predicts Flexibility of Adolescent Idiopathic Scoliosis to Bracing"

Mr Liu HT (supervised by **Professor KDK Luk** and **Dr Hu Yong**) had won the best young engineers' paper in the Hong Kong Biomedical Engineering International Conference 2008 for his paper "Comparison of blind source separation methods in the fast somatosensory evoked potential detection"

Ms Lui SC (supervised by **Professor KMC Cheung** and **Dr K Yeung**) had won the best young engineers' paper in the Hong Kong Biomedical Engineering International Conference 2008 for his paper "Bioactivity enhancement of polyetheretherketone (PEEK) by plasma immersion ion implantation"

Mr Steven KL Lam (supervised by **Professor KDK Luk** and **Dr W Lu**) had won the best young engineers' paper and best oral presentation award in the Hong Kong Biomedical Engineering International Conference 2008 for his paper "Large Animal Model for the Intervertebral Disc Allograft Transplantation"

Hello

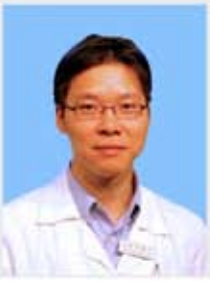
Dr Richie Chan and **Dr Ian Wong**, basic surgical trainees from Department of Surgery of QMH and **Dr August Fok**, resident specialist

Dr D Samartzis, Post-doctoral Fellow, Department of Biochemistry, was appointed as Honorary Assistant Professor

New Appointment

Dr. Frankie Leung (right) has transferred from the Hospital Authority to HKU as Associate Professor

Dr CF Chan (lower left) and **Dr WY Cheung** (lower right) have been promoted to Associate Consultants



Dr. W Lu (left) and Steven Lam (middle) collecting their award in the HK Biomedical Engineering International Conference

Date	Upcoming Events	Venue
19-21 Mar 2009	AO Spine Course High Risk Spine Surgery	Pamela Youde Nethersole Eastern Hospital Li Ka Shing Faculty of Medicine, HKU
28 Mar 2009	Spine Subspecialty Course	Multi-function Room G/F, Block D Queen Elizabeth Hospital
22-29 Apr 2009	Satellite Program of 6th HK International Orthopaedic Forum	The Duchess of Kent Children's Hospital Pamela Youde Nethersole Eastern Hospital Queen Mary Hospital
25-26 April 2009	6th HK International Orthopaedic Forum Musculoskeletal Degeneration Concurrent Session (25 Apr 2009) Workshop in Arthroscopic Rotator Cuff Surgery	William MW Mong Block Li Ka Shing Faculty of Medicine HKU

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