DONALD GUNN LECTURE
'How Dare You!' Breaking Down the Barriers to Innovation

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Since the emergence of Orthopaedic Surgery from the discipline of general surgery in the early 19th century, centres of orthopaedic learning were headed by scientific minds and keen observers who were also master craftsmen, such as Abraham Colles (1814), Hugh Owen Thomas and his nephew Robert Jones. The formation of the American Orthopaedic Association (1887) and the British Orthopaedic Association 31 years later established the specialty at the wane of the Victorian age.

Orthopaedic instruction then was a combination of clinical observation, bench research and surgical craftsmanship delivered or sanctioned only by the department heads in the respective centres of London, Liverpool, Edinburgh in the UK and Boston, Rochester and New York in the US. Innovative thinking was driven by the doyens of the day. A similar trend had already occurred in the European centres of France and Germany. The common thread was that the chiefs dictated the development of surgical arts in areas where they registered an interest. Not only operations but instruments and techniques often bore their names (Küntscher, Lane, Hohmann & Lohmann, Bickel, Watson-Jones). They were the innovators and they were the giants in their time. Their institutions continue to remain relevant today.

Singapore's orthopaedic specialisation began after WWII when James Cameron (1951-1955), Anders Karlen (1955-1961), and Donald Gunn (1961-1967) were appointed by the government to devolve orthopaedic surgery from general surgery. Donald Gunn also helped form the University Department of Orthopaedic Surgery in 1962. However, now more than 50 years later, orthopaedic surgery is still a chapter under the College of Surgeons in our Academy of Medicine, Singapore. The American Academy of Orthopaedic Surgeons was formed in October 1931, and the youngest body in our region is RCOST (Thailand) which formed in Sep 1996.

The only independent affiliation we have now is to the Singapore Orthopaedic Association. We have somehow not dared to break away from our erstwhile general surgical colleagues. How dare we.

When I was a young registrar, I had an interest in microsurgery and spent almost a year in the Department of Plastic Surgery in SGH. When I was posted to another government orthopaedic department for my surgical rotations I was castigated by my consultant for repairing a radial artery alone in the middle of the night. Further along the way I had my wings clipped for doing things in a new way. I took it in stride and it was only when I attained senior registrar status that I was left somewhat to my own devices under more enlightened bosses.

In 1984, I did the first part of my overseas Fellowship in Edinburgh at the Princess Margaret Rose and Royal Infirmary Hospitals. Apart from trauma, it was a foreboding of the decline of British orthopaedics. Waiting lists under NHS for joint replacement averaged 5 years! For the second part, I crossed the Atlantic in winter to the American version of Siberia at the Mayo Clinic and how that changed my appreciation of real orthopaedic practice and instruction. There patients were listed for surgery the day after consultation! Under my mentors tumour surgeon Dr Frank Sim and bioengineer Edmund Chao I saw what innovation and independant-thinking did to move orthopaedics.

I will never forget my first day in the Operating Room at Saint Mary's Hospital in Rochester. Dr Sim asked me if I knew how to do a Syme's amputation which was listed for a recurrent forefoot sarcoma. When I answered in the affirmative, he promptly assigned to me first-year resident Mary O'Connor who was first day on the job in the tumour service. I almost choked as he walked off to start a case in another OR. For the next case, I quickly announced that I had never done an internal hemipelvectomy before. Today, Mary O'Connor is the first lady president of the male-dominated US Hip and Knee Society, and also Department Chairperson at Mayo Jacksonville. She has carried the baton for the next lap.

Singapore aspires to be the "Mayo" of Asia. We have been sending our newly certified surgeons to renowned centres every year for the past 30 years to learn from the best. We became par with some of the best. We became teachers of those from surrounding countries through our extensive fellowship training programmes...and we patted ourselves on our backs. Doesn't seem too bad for a small country of 3 million with 150 orthopaedic surgeons then. Or so it seemed.

In the 90's, Singapore surgeons who spoke Mandarin were invited to translate slides for English-speaking faculty from Europe and the US speaking in China. No more. Not only do the Chinese surgeons speak excellent English, they are now invited as Chairmen of international courses. It's the same for Koreans and Taiwanese. No more do we have a

premium on the English language. In simple words, we have been bypassed in the world of orthopaedics in the developing world. Did we miss something somewhere?

I travel extensively in Asia to lecture and conduct workshops for surgeon colleagues to the tune of 8-10 trips a year. Ten years ago, they wanted to know about how to do everything. I realise now that my invitations to speak in the region arose from people wanting to know about the finer points of techniques they already picked up on the Internet and from conferences elsewhere. In other words without continuing technological advances and ongoing research, we will lose steam in trying to stay ahead.

I had ventured to search out new knowledge after my return from Mayo and eventually developed an interest in the Ilizarov Method in 1989 after the visit of Roberto Cattaneo, MIPO in 1998 after the visit of Christian Krettek from Hannover, and applied the Acetabular spring plating after Marvin Tile came from Toronto for an AO Course. The Gull-wing sacral plate was designed following cadaveric, biomechanical and radiographic evaluation (only to be patented by an Indian surgeon from Chandigarh). I pushed for the reporting of what is now known as the Atypical Subtrochanteric "Singapore" fracture associated with long-term use of bisphosphonates. I was almost served a lawyer's letter by a certain company if I persisted. How dare I. Today it is a reportable adverse drug event to the Health Sciences Authorities of Singapore and FDA. The annual Zimmer Mechanobiology Trauma Course in Asia which was co-founded with me is in its 9th edition and going strong.

What is my message? What do we need to do to keep leading the region with our neighbours baying at our heels? How can the mouse keep roaring?

Two words. Innovation and Research.

We have some of the best minds in biotechnology in Singapore which splashes 4-5 billion dollars annually on biomedical facilities and research centres. We as a profession have hardly risen to take advantage of these resources. There were 4 musculoskeletal grants awarded by National Medical Research Council in 2010, dwindling to 1 in subsequent years. Only one significant musculoskeletal project in excess of SGD 2 million is in progress. Why? We certainly have some of the best brains and hands comparable to anyone. We should be coming up with innovative ideas in orthopaedic surgery, but we have not. Research is relegated to juniors who have to do it as part of their residency requirements. Few Level I and II studies are in progress and even Level III studies have difficulty getting published. As one body, we have drifted and lost direction. We do not nudge one another to the heights we are capable of.

Some reasons (or excuses) come to mind. Money, fame, leadership. Decades ago, Dr Pesi Chacha in the University Department received an operating microscope from the Rotary Club. With Prof Robert Pho, they put Singapore on the map as a centre for microsurgery. Till today their names are mentioned when I visit centres in Asia. They had no money then, but it was provided to them. They helped Singapore achieve fame. They became leaders of their hospitals. It was a momentum, but that has since slowed and the Chinese, Taiwanese, Japanese, Koreans and Thais have overtaken us. We have lost our leadership position. The number of fellowship applications to our teaching hospitals is dwindling. Twelve month fellowships are being shortened by half.

But our surgeons have been making more money. It is no coincidence that the government's move in SingaporeMedicine to boost numbers of foreign patients is a far bigger carrot than the billions freely available for research. Research and innovation doesn't pay the bills; patients do.

Indeed, our energies seem to be sidetracked into the pocket. We have been made to recognise that wealth accumulation is a sign of good practice of modern orthopaedics. This vibe has percolated down to our junior staff and younger surgeons. The brains we have sent to garner new knowledge are not spending enough time in their institutions to develop research, innovative technology, new methodology nor services that will make us rise above that in our neighbouring countries. More and more young surgeons are going into private practice within 10 years of getting certified. Grappling with making a (better) living will not allow them to grow the thinking mind. Indeed, the best skills they will have was when they left the institutions. They should recognise that not only will they soon be outpaced by even younger local surgeons with newer knowledge, they will face competition drawing away their foreign patients as skill levels improve in countries around Singapore.

Is there a way out of this middling in Singapore orthopaedics?

We need a drastic change of emphasis. The ability to make money by expanding the non-subsidised service should not be put on a pedestal by institutions to be worshipped in P&L comparisons. There should instead be a de-emphasis on how much a department makes for the hospital which is a myopic way to stay ahead of the competition. Department heads and hospitals executives should encourage and support their surgeons who have enquiring minds and bright ideas. Reputation should be judged on how many educational events and fellowship training programmes

are conducted by departments. We need leaders who understand that the power of reputation lies in staying ahead of the pack. We no more compete in South-east Asia but with greater Asia and the rest of the world.

We aspire to be a world city and a Mayo Clinic. It will not achieved by economic power nor by numbers of medical tourists seeking healthcare here. We are already the second most expensive city in Asia with respect to healthcare costs, with no signs of price self-control. With the establishment of ASEAN Economic Community (AEC) in 2015, it is foreseeable that well-trained English-speaking orthopaedic surgeons from the 9 other countries will easily pass our Medical Council requirements to open up practices here. Unless we can take entry examinations in Tagalog, Bahasa, Thai or Vietnamese, forget about doing reverse engineering. Our English appears now to be our death knell! Many surgeons I know from Malaysia and Indonesia have already sent their children to live and study in Singapore. Soon they can also work here.

There is still time to push back the tsunami. We need to work together in the SOA since we are not an independent entity in the Academy of Medicine which dictates policy. Only we can save ourselves from the waves of innovative, well-trained and conversant surgeons who are just waiting to swamp our prosperous shores. Our survival as a group may depend on it...if not, then I will just go retire in Chiang Mai.