7th Tan Tock Seng Oration: Surgical Excellence at TTSH—100 Years on and onward†

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Mr SR Nathan, our guest of honour, Mr Gan Kim Yong, Minister for Health, Madam Kay Kuok, Chairman of NHG Board, Board members, colleagues, distinguished guests, friends, ladies and gentlemen, I am greatly humbled by the honour and privilege to deliver the 7th TTSH Oration this evening. The sixth lecturer was the late Dr Balaji Sadasivan, who was a neurosurgeon of the hospital. His topic? HIV. He went into politics and became a Senior Minister of State. I am not a surgeon and have no wish to enter politics. What can a physician muse about that would interest our illustrious, hardworking and dedicated surgical colleagues?

I have decided to speak on 3 areas. The first reflects on Mr Tan Tock Seng, without whom we will not be together tonight, celebrating the 168th anniversary of the hospital. It will also cover the period from 1844 to 1911. The second dwells on the 100 years of contributions from our surgical colleagues (1912 to 2012). I will conclude with some thoughts on our profession and professionalism because the challenges to the professional ideal in the modern world are far greater than they were in years gone by.

The Early Years

Mr Tan Tock Seng was a Hokkien born in Malacca, Peninsular Malaysia. He migrated to Singapore at the age of 21 years in 1819, soon after its founding by Sir Stamford Raffles. Beginning as a vendor of vegetables and poultry, he thrived as an entrepreneur through industry, thrift, and acumen to become a rich businessman, philanthropist and the first Asian Justice of Peace. He owned much land and property in Singapore.

There were several pauper hospitals in Singapore at that time: at Bras Basah Road, Stamford Road and Kandang Kerbau. There were also 2 pauper hospitals on Pearl's Hill; one for the paupers, the other for the European seamen. In 1827, the Resident Councillor, J Prince, wrote to the Surgeon in charge of the paupers hospital requesting the Chinese community to source funds, build and run a hospital. Each class of inhabitants was expected to support its own poor. In 1843 after a meeting with Governor Butterworth, Mr Tan donated $5000 towards such a building. Together with another $2000 bequeathed by Mr Cham Chan Sang, a Chinese merchant, the government agreed to the new Pauper Hospital. The foundation stone was laid on 25 July 1844 on Pearl's Hill during the reign of Queen Victoria (1837 to 1901). It was called the Chinese Paupers Hospital but served folks from all countries.

Throughout the history of Tan Tock Seng Hospital (TTSH), the majority of donors to the hospital were Chinese with the exception of Syed Omar Aljunied, the Arab merchant, and the Parsee community. The hospital was not occupied until 1849. On 24 February1850, Mr Tan passed away at the age 52 years after a short illness. In 1851, TTSH came under a Committee of Management with the Resident Councillor, T Church, Mr Tan Kim Ching (Tock Seng's eldest son) and others as its members. In 1860, TTSH moved to its second site at Balestier Plain, at the junction of Serangoon and Balestier Roads, where now sits the Kwong Wai Shiu Hospital (Fig. 1). On 27 August 1880, TTSH became a corporate body under the Hospital Ordinance. It provided for a Committee of Management and included the eldest male descendant in the male line of Tan Tock Seng residing in Singapore and who was willing to serve.

Surgery then was very primitive; instruments were rusty. In 1882, 14 surgical operations mainly for trauma were performed; none died. In 1886, 16 major operations were done by apothecaries who were later replaced by 2 European house surgeons in 1890. (They were not specialists.) In 1901 with chloroform anaesthesia, 101 operations were performed. This increased to 271 in 1905 (when the Medical

Kwong Wai Shui Hospital today in Serangoon Road. At the rear of this building are the old wards of the second Tan Tock Seng Hospital.

Fig. 1. The second Tan Tock Seng Hospital.

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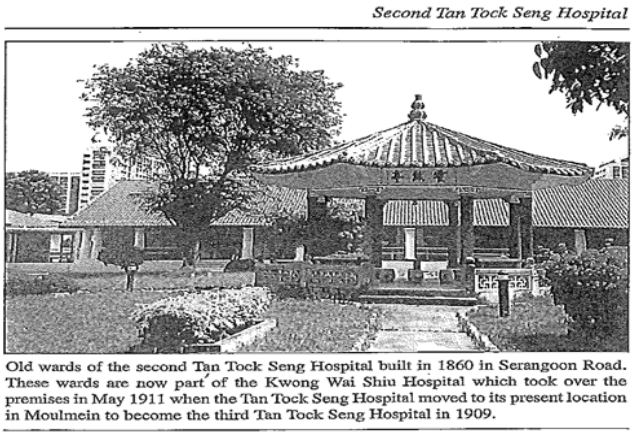

Fig. 1. The second Tan Tock Seng Hospital. (con't)

Fig. 2. Entrance to the third TTSH at Moulmein Road.

School was founded) but still, there was no specialist surgeon in Singapore.

The unhealthy flood-prone site at Balestier Plain resulted in the decision in 1903 to move TTSH to the hill at Moulmein, the hospital's third site where it stands today (Fig. 2). The new buildings were completed in 1909 (during the reign of King Edward VII 1901 to 1910) at a cost of $500,000.

With 1028 beds in different blocks spread over 1.05 hectares of land, it was designed and built by the Public Works Department. The colonial government bore the cost of the land and buildings which were cast in iron and timber and were quite attractive (Fig. 3). There was a surgical operating room, situated adjacent to the wards. Significant donations were received from well-wishers including Mrs Loke Yew.

In 1905 the medical school was founded. Two years later, the first batch of medical students held classes at TTSH at Balestier Plain. In 1909, TTSH moved to its present site on the hill at Moulmein. A good deal of surgery was done

Fig. 3. Interior of ward.

in 1910 with 583 operations recorded (including dental operations). Singapore then had surgical services available only at TTSH and the Singapore General Hospital (SGH). TTSH had 60 beds with 2 surgical units. Splenectomy for trauma and chronic malaria was performed here for the first time in any number. The weight of spleens removed was anywhere from 800 to 3000 grams. Later in 1910, spinal anaesthesia was available and 28 operations were done with this method. Using a 2% iodine solution to disinfect the skin for both major and minor operations resulted in stitch abscesses becoming less frequent. Still, there was no one of established and unquestionable standing as a surgeon.

100 Years of Surgical Excellence

In 1912, Dr J Gray, resident medical officer TTSH took up temporarily the duties of the new post of surgeon to the Singapore hospitals. Operating theatres were improved. Gas was piped in to light up the theatre for emergency operations after dark. The following year, Dr JR McVail, the medical officer in charge of TTSH, officiated as surgeon as well. Dr Whittle was appointed visiting surgeon to TTSH. Visiting surgeons also served Kandang Kerbau Hospital for women. In 1913, they performed 3 major operations there. An ovariotomy was done by Dr McVail and a complete hysterectomy for uterine myomata and a removal of carcinoma of the breast were successfully performed by Dr Whittle.

The first surgeon with a specialist qualification, FRCSE, Dr CJ Smith, was appointed to TTSH in 1914 on transfer from the Federated Malay States Medical Service. The number of operations continued to rise, with 941 in 1912, rising to 1443 in 1913, and 1853 in 1914. By 1918, the department of surgery was well established under Dr CJ Smith. The same year, the branch for ear, nose and throat (ENT) surgery was established.

Professor of Clinical Surgery

On 24 September 1923, Dr A Dickson Wright was appointed a medical officer under Dr Smith, the senior surgeon. By 1926 after considerable experience, he was appointed Professor of Clinical Surgery, and was responsible for the teaching of surgery as well as the surgical duties at TTSH. He resigned to accept a post at St Mary's Hospital, London in 1928. Dr BM Johns, medical officer was promoted to this post. He also taught otology, rhinology and laryngology. Dr DEC Mekie acting Professor in 1935, was promoted in 1937 to Professor of Clinical Surgery. TTSH was the main teaching hospital for medical students before the War.

Hakuai Byoin

During the war years (1942 to 1946), TTSH was renamed the "Universal Love Hospital" and used by the Japanese as their civilian hospital. TTSH was organised by the most senior local doctor, Dr WA Balhetchet, its Chief Medical Officer into 2 medical units and 2 surgical units. Dr Balhetchet headed one surgical unit, and Dr ATS Chong the other. A Japanese administrator ran the hospital. TTSH also had then Eye, Ear, Nose and Throat and Dental services with a clinical laboratory. Radiology comprised mainly fluoroscopy of the chest and screening for fractures. The eye surgeon was Dr Yeoh Bok Choon, and Dr Lai En Fo the ENT surgeon. The dental surgeons were Drs Lim Eng Bee and Bong Lip Look. TTSH became a civilian hospital after the war ended.

Post War Era

The volume of surgical work increased at a rapid rate of 10% annually. By 1949, 3 surgical units together performed 6000 operations including major ones like stomach and lung resections. Tuberculosis (TB) was the scourge then. The Rotary Clinic for TB was set up with 2 x-ray machines in 1949. As workloads grew, the Ministry of Health (MOH) upon review decided to double the clinical facilities at TTSH. The new hospital, comprising 5 six storey buildings, opened in 1957 (Fig. 4). In 1961, TTSH came under the government, and that year, it built a $1.5 million operating theatre, one of the finest in Asia, for chest operations.

With the relatively rapid decline of TB, and with the disciplines of Medicine, Chest Medicine and Diagnostic Radiology well established, the stage was set in the late 1960s for the transformation of TTSH into a general hospital. The first priority was Cardiothoracic Surgery and with it, the Anaesthetic Service. In 1965, Dr NC Tan started the department, with pioneers Dr Dixie Tan (perfusionist), Dr Eric Goonetileke (anaesthetist), and Drs Francis Chia, Wu Dar Ching, Tan King Twok and Joseph Sheares (surgeons).

Fig. 4. New TTSH in 1957.

In 1967, the first open heart surgery was done and in 2 years, over 100 such operations were performed at TTSH with a success rate of over 95% making it one of the best in the world. In 1976 the first coronary bypass operation was carried out. In 1981 the whole department was transferred over to the Singapore General Hospital.

In 1972, Neurosurgery was set up at TTSH with Mr CF Tham as Head, and Mr Gopal Baratham as neurosurgeon. Dr Loong Si Chin was the chief of neurology and one year on, the Department of Neurology and Neurosurgery was established as the nation's major referral centre. Before World War 2, the anaesthetic agents used were mainly chloroform, ether and ethyl chloride. In 1846, doctors were using ether to induce insensibility, not quite successfully. By 1882, surgeons were practising the aseptic technique, and by 1904, doctors at the Johns Hopkins Hospital were grappling with agitated patients undergoing surgery using ABC for anaesthesia—wetpacks and doses of alcohol, bromides, and chloral hydrate. Surgeons or apothecaries administered these. Post war, local doctors were sent overseas for training and returned appropriately qualified. In 1973, the department of Anaesthesia was established, headed by Dr Raymond Pereira, with Dr Lilian Lee and later Dr MK Chin on staff. In the 1980s, the department was the first in Singapore to monitor end tidal carbon dioxide levels in patients undergoing neurosurgery. Its expertise in neuro-anaesthesia and intensive care (for surgical and neurosurgical patients) was well recognised. The department was the first to use MRI-compatible anaesthetic machines in 1995.

Although General Surgery was carried out at TTSH in the early part of the 20th century, since 1912, it was in 1975 that the unit was officially established with Dr NE Wong as its first head. Before this, the surgical units of Toa

Payoh Hospital and SGH, provided the service at TTSH. The general surgeons of that day performed craniotomies, thoracotomies, and urological procedures in addition to abdominal surgery. Orthopaedics and trauma were also part of the general surgeon's responsibility. Mr Wong himself was Singapore's first trained urologist, and performed the country's first Trans-Urethral Radical Prostatectomy. Drs Anthony Heng and SP Vij were the other surgeons. Excellent work in endoscopy, endoscopic surgery, gastrointestinal and thoracic surgery were performed. Operating Room (OR) nurses are critical in any operation. In 1975, Ms Wong Wai Cheng was posted from Surgery B unit SGH to TTSH to start its operating theatres with Dr Wong. She was promoted to Nursing Officer in 1976, and then Assistant Director of Nursing in 1997 before retiring from service in 2001. Ms Wong was the first OR nurse to receive the Ministry of Health's HMDP (health manpower development program) award for operating theatre administration. Dr Low Cheng Hock assumed headship of the department in 1984. He performed the first laparoscopic cholecystectomy in Singapore in 1991.

In 1952, a department of Orthopaedic Surgery was formed in the University of Singapore with Mr JAP Cameron as its first Professor of Orthopaedic Surgery. It was based at the Singapore (then Outram) General Hospital (SGH). The first annual report of the department mentioned 40 cases of poliomyelitis treated at Middleton Hospital and 60 adult cases at TTSH. An orthopaedic service became available at TTSH in the 1970s with the first total hip replacement taking place in the cardiothoracic theatre at TTSH in 1972. A spinal injuries rehabilitation centre was formed in 1973, based at TTSH wards 60 to 61 situated along Mandalay Road. Dr Chan Heng Thye Orthopaedic consultant was appointed in 1976 to head the Accident and Emergency Department, with the department of Orthopaedic Surgery being formally established the following year. Dr Chan headed both departments. The Artificial Limb Centre was set up in 1981 for the manufacture of prostheses and orthotics.

The Eye and ENT ambulatory services were provided at TTSH by surgeons on roster from SGH starting in 1978. The department of Ophthalmology was formed in 1979 with Dr Victor Yong as its head. Its special strengths were in cataract and laser surgery and glaucoma. It excelled also in the retina and in neuro-ophthalmology.

In October 1983, Dr K Abraham was appointed the first head of the ENT department. Dr N Kunaratnam started subspecialisation when he was the department head from 1989. Eye services shared the same ward (ward 5) with ENT until the latter occupied its own premises in 1993. TTSH was the first to introduce carbon dioxide laser surgery in ENT surgery in 1996.

At TTSH, the first bone marrow transplant took place in 1985, the same year that Middleton Hospital was renamed as the Communicable Disease Centre and absorbed as part of TTSH. The following year, the first Organ Procurement Unit started operations to harvest kidneys for transplantation. The first Geriatric department in Singapore opened its doors in 1989 and in 1992, TTSH was restructured as a corporatised public institution.[1]

TTSH Turns 150 Years Old

In 1994, TTSH celebrated its 150th anniversary and established the Charity Fund to assist the less fortunate patients. It also launched the first Neurosurgical Intensive Care Unit (with the first Critical Care Information System in Singapore) and the Surgical Intensive Care Unit under the charge of trained intensivist anaesthetists. The following year, TTSH was the first local hospital to provide Magnetic Resonance Imaging (MRI) to the patients. The MRI-compatible machines allowed general anaesthesia during MRI scanning to be given safely.

The foundation stone for the new hospital was laid in June 1996. The building was completed, a new logo launched and the hospital was fully operational on 4 May 1999 (Fig. 5). Its official opening on 1 April 2000 was by then Deputy Prime Minister, BG (NS) Lee Hsien Loong (Fig. 6). During the years till the end of the century, TTSH achieved a number of firsts. Patients were offered non-surgical treatment of cerebral aneurysms by the neuroradiologists. Radical perineal prostatectomy by Associate Professor Chia Sing Joo, the first Head of the department of Urology (2006), video urodynamic studies, Extracorporeal Shockwave Lithotriptsy (Siemens Modularis), stereotaxic MRI guided thalamotomy for patients with Parkinson's disease, laparoscopic transgastric resection of submucosal

Fig. 5. New TTSH in 1999.

Fig. 6. Opening of the new TTSH in 2000.

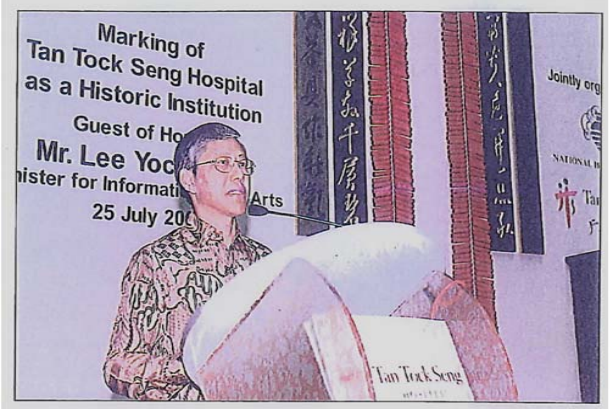

Fig. 7. TTSH declared a historic institution in 2001.

tumours of the stomach, portal vein embolization prior to hepatectomy to shrink liver volume, were performed. The first Erectile Dysfunction Clinic and the Pre-Operative Assessment, Counselling and Evaluation (PACE) clinic run by nurses but physician led were established.

21st Century

TTSH was made a historic institution on 25 July 2001 by the National Heritage Board, and its Museum was opened (Fig. 7). The first laparoscopic radical nephrectomy (2002) and laparoscopic radical prostatectomy (2003) were performed by Dr James Tan. The ENT department was first to offer Computer Assisted Image Guidance Surgery for Endoscopic Sinus Surgery to its patients in 2002. TTSH's Centre for Advanced Laparoscopic Surgery was accredited by the Society of American Gastrointestinal Endoscopic Surgeons in 2003. The same year, the Hospital became SARS central for Singapore as the new virus spread from China and Hong Kong to our shores. For almost 6 months, TTSH was the battle ground. The following year, the hospital achieved the US Joint Commission International accreditation for hospitals. The Emergency Department was enlarged with capacity growing of 30%, and the Emergency, Diagnosis and Therapy Centre started operating for patients with acute conditions needing less than 24 hours of stay. Intralase was introduced for all laser LASIK procedures for vision correction. NoraVision restoration, the first in Asia was introduced to treat patients left partially blind by stroke or brain injury.

In 2006, the hospital Radiology department went filmless. All images were digital, electronically stored and retrieved. The intensive care units implemented electronic patient charting and documentation. Laparoscopic surgery began evolving into Robotic surgery as the Da Vinci Robotic program was applied in colorectal, thoracic and neck operations. By 2010, all the 24 operating theatres were equipped with an integrated anaesthesia record electronic system. The same year, robotic prostatectomy was available for patients. In 2011, the first robotic gastrectomy in South East Asia was performed at TTSH.

Meanwhile the progress into subspecialisation continued unabated. Today, there are 9 subspecialty units under General Surgery, namely, Colorectal Surgery, Upper Gastrointestinal Surgery, Trauma and Acute Care, Breast and Endocrine Surgery, Hepato-pancreatico-biliary Surgery, Vascular Surgery, Head and Neck Surgery, Plastic and Reconstructive Surgery and Thoracic Surgery. Within Orthopaedic Surgery, there are 7, namely, Hand and Microsurgery, Spine Surgery, Trauma Surgery, Sports Medicine, Arthroplasty, Ankle and Foot Surgery, and Musculo-skeletal oncology. For ENT, there are 8 subspecialty clinics, namely, for Nose, Otology, Giddiness, Head and Neck cancer, Voice, Sleep Apnoea, Facial Plastic, and Noise-induced deafness. Some are multidisciplinary clinics. Within Anaesthesia, there are the subspecialties of Neuro-anaesthesia, Neuro-intensive Care, Surgical Intensive Care, Interventional Pain Management, Regional Anaesthesia and Ambulatory Anaesthesia.[2]

There is no doubt that with new technologies, globalisation and the internet, surgery will continue to advance. There will be greater pressures to cope with new knowledge and skills by subspecialising yet further. The challenge is still to provide our patients the best care. We must not forget our roots—not just science and technology, but also humanity. I would therefore like to review the ideals of, and commit ourselves anew to our profession and our professionalism.

The Professional in The Profession

What is the Purpose of Medicine?

The purpose of medicine is to serve the community by continually improving health, healthcare, and the quality of life for the individual and the population. We do so by health promotion, prevention of illness, treatment and care,

and the effective use of resources, all within the context of a team approach. The surgeon is special in that through surgery he adds an extra, usually more expensive dimension to the treatment. He is special in that the resources he uses are not minimal to fulfill the surgery safely. Rarely can he work alone to perform the surgery.

What is a Profession?

It has characteristics as follows: It is a vocation or calling and implies service to others. It has a distinctive knowledge base which is kept up to date. It determines its own standards and sets its own examinations. It has a special relationship with those it serves. It has particular ethical principles. It is self-regulating and is accountable to patients and to the profession itself.

What do Doctors do?

The broad role of doctors is to see patients, do investigations, prescribe or carry out treatment, including surgery, do research and teach. In caring for patients, commitment and compassion are very important. One key element is making a diagnosis, and assessing its consequences. It involves the rational use of resources, good communication skills, and the holistic nature of patient care. It is a person with an illness we deal with; not just an illness in a person.

Looked from the patient's perspective, clinical practice revolves around 6 questions. One, what is wrong with me? The diagnosis. Two, what does it mean for me? The prognosis. Three, what can be done for me? The caring and management component. Four, what can I learn from this? The research perspective. Five, what can others benefit? The public health dimension. And six, what can I teach others from this experience? The educational opportunities both for patients and for professionals (I include here the other members of the healthcare team, nurses, allied health professionals) Why specialise (and subspecialise)?

America's chaotic system of specialties grew out of 2 world wars. During the first World War, the United States Army found that over half of the country's ophthalmologists were incompetent. As a result, each speciality set up its own speciality brand with ophthalmologists the first to do so. The second World War accelerated the need for specialists, and the revolution in medical and surgical technology after the war further increased the growth of speciality medicine and surgery.

This has led to fragmentation of care as each expert tends to his part on the patient. Proper care and coordination for the patient with many specialists inputs is necessary to do more good than harm. If simple, this could be managed by the knowledgeable, interested patient with the help of his primary care doctor. If more complex, the help of a generalist physician is useful. The same challenge confronts the field of practice of the general surgeon. As we all know, within general surgery, there exists today subspecialties like endocrine surgery, breast surgery, hepatobiliary surgery and so on. What of their future status?

New technology, more knowledge in each of these areas will pressurise the surgical fraternity to allow each to become separate entities. The general surgeon of the 1960s used to do craniotomies and chest surgery; he was not just confined to the abdomen.

Professionalism

As TTSH gears itself for the new Lee Kong Chian School of Medicine on site at the Novena campus with its first undergraduate student intake of 50 in 2013, we as the senior staff of the hospital need to be good role models for our profession. It will mean a continued demonstration of the following:

1. Compassion, integrity, and respect for others
2. Responsiveness to patient needs that supercedes self interest
3. Respect for patient privacy and autonomy
4. Accountability to patients, society and profession, and
5. Sensitivity and responsiveness to a diverse patient population, including diversity in gender, age, culture, race, religion and disabilities.

It is important to make the distinction between a trade, a business, or a mere occupation, and a profession. A trade or business is an occupation or calling in which the primary object is pecuniary gain. But in a profession, service is the ideal, and the earning of remuneration must always be subservient to this main purpose. Powerful challenges daily confront the professional to be less professional. Illness renders patients vulnerable and doctors have specialised knowledge and skills that give them the power to take advantage of that vulnerability. Consequently, the ethical code requires that doctors exercise liberty to promote their patient's best interests, not their own interests. It is no secret that surgeons in private and public practice usually earn far more if every patient they encounter needs an operation or two. This need not make them less professional but the temptation is ever present.

A failure to comply with high standards of professional conduct can undermine the public values on which life as a nation and community depends. We need to appreciate that compliance with professional standards is the shield which protects us from disaster and catastrophe. The failure

to maintain high standards of conduct results in a forfeiture of trust and confidence in the profession. The good surgeon knows how to operate; a competent surgeon, doing the surgery effectively and efficiently. The better surgeon knows when to operate. The best surgeon knows when not to operate. It cannot be that the operation was a success but the patient died. With more elderly patients, sound clinical judgment about when to and when not to operate become critical for good patient outcome.

We should worry about our profession's integrity. We need to realise how easy it is for a good person to make one tiny, unimportant compromise after another, until he is too compromised to find an honest way back. It is easier to do the right thing a hundred per cent of the time than 98% of the time.

Conclusion

Mr Tan Tock Seng came from his birthplace, Malacca to Singapore in 1819, a poor man selling poultry and vegetables. When he made it rich, he remained compassionate and cared for his fellow human beings. With $5000, and another $2000 from Mr Cham Chan Sang he founded the Chinese Paupers' Hospital on Pearl's Hill in July 1844. His untimely death in 1850 at age 52 years was a great loss to the local community. Nonetheless his descendants continued his noble tradition of showing care and compassion to his fellow men, serving and donating generously to the hospital.

The 100 years of surgical excellence was possible because the government and the hospital provided the additional resources. It was possible because of the many illustrious, committed and dedicated surgeons who served and led in the various specialties. We applaud and commend them for their unselfish contributions. They have moved on. Others have succeeded them. The search for greater surgical success is relentless—for the benefit of our patients.

There are powerful forces challenging our profession and our professionalism. All doctors are at risk; the surgeon appears to be at high risk. Most will take good care to resist the obvious temptations of putting personal interests ahead of the interests of the patient. It is of fundamental importance that we continue to adhere to the professional ideal in all its aspects.

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