Standing on the shoulders of giants: the value of teaching, leadership and support

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‘If I have seen further it is by standing on the shoulders of giants’. This is a quote attributed to Sir Isaac Newton in a letter to Robert Hooke in 1673, where he recognises that the learning of a skill is incremental. However, this statement was previously recorded as a saying of Bernard of Chartres, a French medieval scholar of the 12th century.1

Teaching the techniques of orthopaedic surgery to young doctors is not so easy during medical study and apprenticeship towards becoming a specialist; most of us are never given the discipline of guidance, instruction and tutoring. This may be compared with becoming a school teacher, who mostly go through structured studies of several years’ duration. Pedagogics has not been well known in our medical world. Scientific teaching has been absent as well. Successful education has depended very much on the support of practising experienced clinical surgeons assuming the role of educators.

Most orthopaedic surgeons find enormous pleasure in doing their work not the least because they feel that they are well educated. Most of us have gone to work with a smile as we expect an interesting and rewarding day. However, our task is complex. We need to have clinics to see and examine patients, make rounds at the wards when needed and do what we often like the most—operate. Many also spend time in research and education.

The amount of surgical knowledge to impart and the technical skill to train are ever increasing, although some newly developed technical devices make the task nowadays less time-consuming. Today, young people are often also learning in groups. Most doctors get great education but the one-to-one teaching which was common earlier is remembered with affection by many of the older surgeons. With this editorial, we want to tell younger surgeons how valuable the personal one-to-one teaching with an experienced and knowledgeable teacher in the field could be. This special teacher—young doctor relationship has shaped our generation.

Arthroscopy, knee surgery and sports medicine - that is, the topics of focus for the International Society of Arthroscopy, Knee surgery and Orthopaedic Sports medicine (ISAKOS), include a multitude of complex areas. The road to becoming an accomplished orthopaedic surgeon requires many years of learning and training with good and well-educated teachers available along the way.

Making a correct diagnosis

After theoretical studies training involves learning how to secure a correct diagnosis. A skilful orthopaedic surgeon should be able to make a correct diagnosis in most cases by listening to the history and properly examining the patient. However, this can sometimes be difficult, and valuable diagnostic tools have been developed, such as MRI, ultrasound and different types of arthroscopy.

Even with the fantastic development of helpful diagnostic tools, the clinical examination is still extremely important. Early tests such as drawer tests were developed to test for integrity or rupture of cruciate ligaments. Special tests for knee, ankle, muscle, shoulder and other injuries were developed.

Anterior cruciate ligament (ACL) injury has always fascinated the ISAKOS membership because of its complexity. The pivot shift test was described by MacIntosh and Galway2 (1973) with Ron Losee3 being involved independently in the observation of this phenomenon. This test is considered to be the true diagnostic test for ACL instability. A good teacher was needed to demonstrate these tests. Roli Jakob had described how he as a fellow in Toronto, Canada (1973–1975), was looking over the shoulders of David MacIntosh and Bob Jackson. David guided his hands when learning to elicita pivot shift. Roli and many with him consider this the most important one-to-one manual skill to be taught to a young orthopaedic surgeon interested in sports. Joseph Torg described in 19744 the Lachman test, which soon became the routine test to indicate an ACL injured knee. Lachman was Torg’s mentor.

Open knee surgery

Don O’Donoghue (1901–1992) intensively studied sports injuries, which at the time were considered ‘self-inflicted wounds’. In 1950, he described ‘O’Donoghue’s Unhappy Triad5 of combined ACL, medial ligament and meniscus tears. He published ‘The Treatment of Injuries to Athletes’ in 19736 with motivation being ‘I try to fix them so they can play’. Albert Trillat (1910–1988) founded a school of knee surgery7 which ensured that Lyon would remain one of the knee capitals of the world. They were strong personalities and became the true giants of the time.

Orthopaedic sports medicine really developed during the 1970s. Knee surgery was at this time mostly open surgery involving the menisci, which often were removed. Many of the young emerging
Orthopaedic Sports Medicine surgeons started to openly repair and reconstruct the ACL. This surgery required skill and good teachers were really needed. The surgery could take 1.5–3.0 hours, often with a >15 cm long skin incision, postoperative cast immobilisation and significant pain.

It is difficult to excite the modern surgeon performing major procedures on an outpatient basis whose sense of wonder is only aroused by the old principles of rest and immobilisation, but some of us recall those days of 6 weeks in a cast with dismay.

TEACHING OPEN KNEE SURGERY

To learn how to operate requires mostly on-site support by a good teacher with patience. To learn one-to-one from a master surgeon is a special treat. It also requires some follow-up. Per Renstrom relates a story from Göteborg, Sweden, when he was learning around 1973–1974: ‘When I was doing some open knee surgery an associate professor came into the operating theatre. He grabbed a chair and sat down behind me. He started to ask questions about what I was doing, what structure I was holding with my pair of forceps. He went through structure by structure. After that I never forget how important it is to always understand what we are doing’.

At this time, nobody became a skilful surgeon without ‘standing on the shoulder’ of a great teacher. The open era of surgery included many challenges as most of the knee surgery was not well described in the literature and there were not many experienced surgeons around. Every case was a challenge in itself. We are very grateful to all the teachers from whom many of the great names today have learnt the basics.

START OF KNEE ARTHROSCOPIC SURGERY

Masaki Watanabe (1911–1995) presented at SICOT in 1957 a colour film entitled ‘Arthroscopy’ and then published in colour, ‘The Atlas of Arthroscopy’. In 1962, he performed the first arthroscopic meniscectomy. He has become known as ‘the father of arthroscopy’, together with his predecessor, Kenji Takagi. Robert Jackson (1932–2010) travelled to Japan in 1964 on the advice of Ian McNab, who had seen Watanabe in action. Jackson was part of the Canadian Medical Team for the Olympic Games and studied Watanabe’s techniques. It is to him that we owe the term ‘keyhole surgery’. A mortuary attendant who was also a private investigator asked him, ‘If I could put this through a keyhole and take pictures inside a room it would be great’.

Diagnostic arthroscopic investigation, especially of the meniscus, emerged quickly around the beginning of the 1970s. Everybody had to take courses and were guided by skilful teachers such as Robert Jackson, Jan Gillquist, Einar Eriksson and Lanny Johnson. The use of video cameras and TV did not emerge until the end of the 1970s, when John McGinty became instrumental. After David Dandy published his article on arthroscopic ACL surgery in 1982, the field exploded. This was not easy surgery and required training together with experienced surgeons. After the knee, arthroscopic surgery has expanded into most synovial joints—hand, elbow, shoulder, hip and ankle—and even spine. Now we also have extra-articular soft-tissue endoscopy and tendoscopy pioneered by Niek van Dijk, (The Netherlands). 10

It has often been young innovative surgeons who have developed the new techniques. This was the case concerning ACL surgery during the 1970s. When reflecting on the state of wrist arthroscopy, Gary Poehling recalls from 1985: ‘…that knee arthroscopy was so contentious when first introduced because the younger surgeons were the primary advocates and we (with Terry Whipple and James Roth) wanted the acceptance to come from more senior members’.

REFLECTION ON HISTORY AND GREAT NAMES

Sports medicine has since the 1970s attracted very talented doctors, and with good teachers, the field exploded during the 1980s and 1990s. However, the field was open to some less careful minds. Some secured good contacts with sports teams and a quick road to fame. The people inside the field know who are the names that stand for good quality and also are great teachers.

There are also surgeons who became famous by suggesting new techniques or theories which have been proven not to stand the test of time. In the 1970’s, some of us were taught that total meniscectomy was the best way to treat a knee as it always grew back. The new technique of arthroscopy got us on the right track. There are parts in the development of sports orthopaedic surgery that we are not proud of. This is now history and will not be discussed here, but some keep on coming back. Remember that everything is not always a success story—common sense usually prevails, which is fortunate.

Science and long-term experience must always guide the development of the orthopaedic surgery field. With this in mind, may we especially acknowledge two great clinical surgeons and scientists who were largely responsible for the ‘K’ and the ‘OS’ in ISAKOS—Ken de Haven and Peter Fowler.

Ken de Haven11 in 1975 was working at the Cleveland Clinic with H Royer Collins and John Bergfeld when he was appointed Director of Athletic Medicine at the University of Rochester, New York. Ken was most recognised for his research on meniscus repair but much loved for his teaching, leadership and wisdom. As president of the International Society of the Knee (ISK), Ken had a pivotal role in the formation of ISAKOS.

In the spirit of his mentor Jack Kennedy, Peter Fowler12 from London, Ontario became a world leader in Orthopaedic Sports Medicine and in particular surgery of the knee, but also in swimming shoulder problems. Perhaps no-one has educated more young surgeons than Pete and he is revered by his former students and fellows. He is one of Canada’s most decorated doctors and had the historical honour of being the first President of ISAKOS.

HOW CAN WE REMEMBER GREAT ISAKOS TEACHERS/LEADERS?

The global pedigree of ISAKOS had its origin with the formation of the International Arthroscopy Association (IAA) in 1974 (president Masaki Watanabe, Japan; vice president Bob Jackson, Canada) and the International Society of the Knee (ISK) in 1977 (president Don O’Donoghue, USA; vice president Albert Trillat, France). It was Trillat’s friendship with O’Donoghue and Jack Hughston (USA)13 which led to the creation of ISK. They all became inspirational leaders. Giancarlo Puddu (Italy) was present at that time as a young surgeon, and has promoted the experiences learnt at this time to today’s surgeons.

A great educator from the 1970s who should be mentioned is Ian McNab from Toronto, who is described by Rolf Jakob as follows: ‘He was such a stimulating shoulder and spine surgeon, a real gentleman and excellent teacher who came up with five new ideas every day. He enjoyed wakening up young residents and foreign fellows around him so that they learned to ask questions and not just accept old dogma’. He was a true educator and teacher.
An organisation is as good as its leaders. As ISAKOS (ISK and IAA) is the world organisation, it has through the years attracted most of the great people in their field. Niek van Dijk, the editor of *Journal of ISAKOS*, has stated that the ‘...world leaders contributing to make ISAKOS what it is today can all be found, touched and addressed during our Conferences’. As time goes by, young surgeons will become more experienced and will take over the role of being teachers. Much is owed to those who were willing to share ideas with their teaching and leadership, communication through journals and congresses, or simply opening the door of opportunity. Any advance is the outcome of a team game, and the struggle to improve has taken place in many nations with many contributions from now-forgotten people—only a few heroes are remembered. The J of ISAKOS acknowledges some of these heroes in publishing ‘The Classic’. The Archives Committee has identified some selected leaders as ‘Giants’. They will be interviewed in depth by ISAKOS and this will be highlighted at the next ISAKOS Congress.

**MODERN TIMES**

It is important that we recognise and respect the legacy of our great teachers and role models. A change is the rapid development of surgical technology. Today’s trainees are more ‘tech-savvy’ than those in previous years. Young doctors have a lower dependence on traditional textbooks and paper copies of journals and articles, and they have a significantly higher reliance on PubMed and electronic access for textbooks and articles.

Research will also change the teaching. Development of cell therapies will grow in importance.

Tissue engineering initiated by Lars Peterson’s research in the 1980s is leading to biological repairs rather than replacing bones with metal. ISAKOS biennial congresses, as well as our journal, will grow in importance and the pressure to produce high quality will increase.

Pressure on young doctors to properly learn the basics and read science will always remain high. Today, young doctors need to be proactive and become more actively involved in professional organisations such as ISAKOS.

In modern times, there seems to be what we can call an ‘industrialisation’ of our profession. Have young orthopaedic surgeons become more relaxed and more tolerant, more accepting and less critical? Have we lost our culture of debating for the orthopaedic conscience? Have we put enough effort into educating our followers and students to become critical thinkers and doubters, independent from today’s constraints?

We, the authors, have been fortunate and have had the honour to be personally educated by great teachers and surgeons. We call them giants for sentimental reasons. We believe that we have really stood on the shoulders of great thinkers. We are very grateful for this. We will always remember our great teachers. We also believe that it is still a sign of ultimate success if the student rises above the teacher—the way of life, the way of progress.

**Contributors**

This a group work based on discussions at some ISAKOS Archive Committee Meetings since May 2019. The whole group participated in these. After agreement with PAR, JB gave suggestions for a basic outline. RPJ and PAR added to this with several mails. An outline for a manuscript was then written by PAR with the support of JB and RPJ. The others have then been more involved again and have given comments after reading it a couple of times. As chair of the committee, PAR has taken on the task to get the manuscript to the *Journal of ISAKOS.*

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