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Editorial

A new paradigm in surgical education. ‘Remote mentoring’



Un nuevo cambio en la educación quirúrgica. «Remote mentoring»

I will leave you with one thought that has pervaded throughout my career: it is a privilege to have the life of another person placed in your hands. It is a unique privilege to serve as a role model for those who assume the responsibility for the lives of others.

Edward M. Copeland

The training of surgeons is constantly evolving, in parallel with the great technological developments that we are experiencing in the 21st century. The classical teaching model initiated by William Halsted at the beginning of the 20th century and applied as a residency programme in many countries has been a great success, allowing surgery to reach an exceptional level of quality at the present time¹.

With minor variations, it is a model of learning and increasing responsibility, making it possible for a doctor, after completing his or her medical degree, to acquire over a period of several years (4–8) the knowledge and skills necessary for the practice of the surgical profession. However, the residency is not the end, but the starting point, since the progress of surgery in terms of techniques and knowledge requires continuous learning throughout the rest of our professional life.

In recent years, advances in communications have allowed training programmes to leave the environment of each hospital and each country through distance learning courses, online conferences, webinars and telemedicine programmes. The internet is also an infinite source of knowledge, where, if professional search criteria are applied, it is possible to find continuously updated medical information.

Despite all these advances, at times all surgeons need the advice and consolidated information based on the experience of other colleagues, which is unlikely to be found in the infinite bibliography and numerous search engines.

Traditionally, surgery attracts young people with strong and independent personalities, with a desire for perfectionism

due to the attractiveness of the surgical technique, the immediacy of the optimal results that surgery offers, and the special relationships with surgical patients.

Learning this profession and in the future working in or leading a surgical service, a section, or a teaching area, has become a goal that requires a strategic vision to succeed. All surgeons can and should become effective leaders in the future. In addition to learning to operate, they need training in methodology, communication, negotiation and resource building, adaptability for teamwork and emotional competence.

Undergoing surgery is an intense experience that is unparalleled in other medical specialties. It can be so all-consuming that other aspects of normal life can become unbalanced. When young surgeons train and begin to progress in their careers, it often seems that something has to be given up while pursuing their passion for surgery, and that something is often part of their personal lives.

The surgical complications inherent in all types of interventions, regardless of their proper execution, mean that young surgeons can sometimes develop feelings of guilt that they could have done more and better, which facilitates episodes of anxiety, doubt, and even fear. A profession in which perfectionism and success is commonplace can also lead to an inability to deal well with guilt and grief when complications arise and the patient dies. All of us surgeons have lost patients, and the feeling that we could have done better is sometimes inescapable.

A good mentor will foster an environment in which complications following well-planned and well-practised operations are seen as learning opportunities, without complexes about seeking support or information from others. He or she should also model an appropriate balance between professional and personal life, demonstrating to the mentee

that a stable personal life adds warmth, understanding, and dimension to professional life.

Mentoring could be defined as the relationship between two people (mentor and mentee), where trust and respect allow for better professional development for the mentee, enabling the latter to overcome the problems and difficulties that often occur in the learning and practice of surgery^{2,3}.

The concept of mentoring is very old, as it was described by Homer in the *Odyssey* in reference to Telemachus' teacher¹. Today, mentoring is universally applied in many fields of science, communications, law and finance, where professional development is essential. The basis of these relationships is always the same: knowledge, experience, and above all a role model (knowledge, expertise, and guidance), together with the objective of providing adequate emotional and psychological support.

In general, most mentors are from the same speciality as the mentee and often from the same centre or city. It is not really an academic supervisor like a PhD thesis supervisor, but an advisor oriented towards surgical education in capital letters. Nowadays, it refers to senior physicians who advise young surgeons regarding their training and future.

In 2005, Thomas L. Friedman, in his book "The World is Flat", described the concept of globalisation, applying it to numerous disciplines such as economics, communications and science in general, from which medical education could not be excluded. This has produced a new paradigm in the teaching of medicine in general, and surgery in particular, as it faces new challenges in the 21st century, both in its practice and in its teaching. To meet these changes will require a more complex approach to the training of young surgeons⁴⁻⁶.

Mentoring objectives are to:

- Help them overcome the adverse situations that often arise when learning surgery.
- Encourage true professional development, giving them self-confidence and satisfaction in their day-to-day work, instilling in them the importance of maintaining a balance between their personal and professional lives.
- Advise them to develop the ability to make decisions that avoid or solve problems.
- Guide them in the development of academic life, through methodological knowledge, teamwork and critical spirit.
- Contribute to enhancing the individual's personal capacity for high quality training, ensuring that mentees become more competent and confident and ultimately provide safer patient care.

The mentor is usually chosen by the person being mentored under strict confidentiality, and it is recommended that both have had some training sessions in the discipline prior to the start of the programme. The sessions between the two may be face-to-face or remote, and always circumscribed with training in surgery. He/she will try to

recommend the best existing paths within the complex and political framework of a surgeon's professional life, maintaining the necessary emotional balance to bring all projects to a successful conclusion and to be able to develop the best ideas.

However, it is advisable for the mentor not to be involved in the employment and promotion committees of the mentee, although it is advisable to be endorsed by a scientific institution or society.

Recently, thanks to technological development, telementoring models have been implemented with great success, constituting an alternative to face-to-face mentoring⁷. This occurs when the surgeon is operating on a patient in an operating theatre and other participants join in virtually from another distant location, being able to see the sequences of the intervention on their own screen, communicating with each other via a microphone or chat.

The major advantages of this remote surgical collaboration are its usefulness for:

- Consulting an expert who is geographically distant in a specific case⁸.
- Training younger surgeons during their first surgeries in real time, offering accessibility solutions with quality criteria.
- Inviting a group of surgeons to observe an intervention without having to travel or be in the operating theatre.
- Teaching and dissemination of new surgical technologies (e.g. robot), and training of auxiliary staff on such equipment in a hospital.
- Dissemination of an institution's experience through affiliated centres and hospitals to discuss complex cases in joint clinical sessions⁹.

Numerous institutions, universities and scientific societies (American College Surgeons, European Society Organ Transplantation, Royal College Surgeons England, Royal College Surgeons Edinburgh, Association of Surgeons in Training) have mentoring programmes at different levels, as institutional support for these activities is essential for the promotion of professional excellence¹⁰.

In addition to the ethical and legal considerations involved in the development of these programmes, technology is critical, as components are required for the capture and transmission of such images, and the link for such transmission. The cost of the necessary equipment and software is still high, although it is expected to decrease in the near future. Recently, 5G technology offers the possibility of transmitting with high speed and signal stability, avoiding the latency that often occurs in current transmissions. This technology still has limitations, but there is no doubt that the benefits it provides will soon outweigh its costs¹¹. The complement of Virtual Interactive Presence and Augmented Reality (VIPAR) will allow surgeons to receive virtual training and assistance from remote locations, offering society a model of learning and quality control in the field of surgery that is currently unparalleled.

There are four settings in which telementoring is of particular significance:

- The teaching and dissemination of new technologies and surgical techniques

Here we should recall the contribution of Prof. Marescaux of the University of Strasbourg when in 2002 he performed a remote cholecystectomy by robot between New York and Strasbourg, which was called the Lindbergh operation in memory of the journey between New York and Paris on the Spirit of Saint Louis plane in 1927 by Charles Lindbergh¹². There are also surgical teaching platforms such as the AIS Channel, promoted by Prof. Lacy of the University of Barcelona, which is widely disseminated throughout the world and has enabled thousands of surgeons to visualise multiple surgical procedures¹³.

- Support for surgeons in rural areas

There is a general tendency to concentrate the practice of major interventions in many tertiary level hospitals, which leads to a decrease in knowledge and experience of some procedures in county or rural hospitals. In emergency situations or as a consequence of complications from previous interventions performed in hospitals with greater resources, the surgeon in the county hospital is in a lesser position to solve often critical problems¹⁴.

- Global Surgery programme support

Global surgery is defined by Dare in 2014 as: an area of study, research, practice and advocacy that seeks to improve health outcomes and achieve health equity for all people in need of surgical and anaesthesia care, with special emphasis on underserved and crisis populations. Of the approximately 250 million operations performed each year worldwide, only 3.5% are performed in the poorest third of the world's population. Thus, the potential for expert assistance in isolated, staff- and resource-constrained locations can be invaluable¹⁵.

- Mobile field hospital support in polytrauma surgery

Trauma is one of the basic forms of illness today. Gunshot wounds in armed conflicts, stab wounds in isolated rural areas, and bull horn wounds at popular events in Spain are examples of trauma, and involve a wide range of injuries, forcing surgeons to work in mobile field operating theatres. Under these circumstances, training programmes (ATLS and DSTC) help in the clinical judgement and initial orientation of these injuries, but the definitive treatment is a challenge due

to the characteristics and severity of these injuries. The existence of these mentoring programmes can assist in the assessment and treatment of these patients in these circumstances.

All these mentoring activities involve a significant effort on the part of all those involved. The work of mentors should therefore be recognised as very useful, and time for mentoring should be included in their curriculum vitae, be recognised with credits, and be taken into account in professional promotion committees.

Patient safety and quality control remain the greatest challenges in surgery today. Technological innovations represented by telemedicine offer a new paradigm for surgeon training and patient safety. Medical institutions and surgical societies must provide the necessary resources to ensure that the application of these new teaching methods has the benefit for surgeons and patients that is expected of them.

REFERENCES

1. Singletary E. Presidential Address Mentoring Surgeons for the 21st century. *Ann Surg Oncol.* 2005;12:848-60.
2. Butt AK, Augestad KM. Educational value of surgical telementoring. *J Surg Oncol.* 2021;124:231-40.
3. Rosser JB Jr, Nitsche L, Yee G, Alam H. The evolution of surgical virtual education and telementoring: one surgeon's journey. *J Surg Oncol.* 2021;124:162-73.
4. Friedman TL. *The World Is Flat.* New York: Picador; 2005.
5. Erridge S, Yeung DKT, Patel HRH, Purkayastha S. Telementoring of surgeons: a systematic review. *Surg Innov.* 2019;26:95-111.
6. Schulam PG, Docimo SG, Saleh W, Breitenbach C, Moore RG, Kavoussi L. Telesurgical mentoring Initial clinical experience. *Surg Endosc.* 1997;11:1001-5.
7. Bilgic E, Turkdogan S, Watanabe Y, Madani A, Landry T, Lavigne D. Effectiveness of telementoring in surgery compared with on-site mentoring: a systematic review. *Surg Innov.* 2017;24:379-85.
8. Huang EY, Knight S, Roginski Guetter C, Hambleton Davis C, Moller M, Slama E, et al. Telemedicine and telementoring in the surgical specialties: a narrative review. *Am J Surg.* 2019;218:760-6.
9. Bogen EM, Schlachta CM, Ponsky T. White paper: technology for surgical telementoring-SAGES Project 6 Technology Working Group. *Surg Endosc.* 2019;33:684-90.
10. Sinclair P, Fitzgerald JEF, McDermott FD, Derbyshire L, Shalhoub J. On behalf of the ASiT Mentoring Collaboration, Council of the Association of Surgeons in Training. *Int J Surg.* 2014;12 Suppl 3:S5-8.
11. Georgiou KE, Georgiou E, Satava RM. 5G Use in Healthcare: The Future is Present. *JSLs.* 2021;25(1):1-22.
12. Marescaux J, Leroy J, Rubino F, Smith M, Vix M, Simone M, et al. Transcontinental robot-assisted remote telesurgery: feasibility and potential applications. *Ann Surg.* 2022;235:487-92.
13. Lacy AM, Bravo R, Otero-Piñeiro AM, Pena R, De Lacy B, Menchaca R, et al. 5G-assisted telementored surgery. *BJs.* 2019;106:1576-9.

14. Sinclair P, Fitzgerald JEF, Hornby T, Shalhoub J. Mentorship in surgical training: current status and a needs assessment for future mentoring programs in surgery. *World J Surg.* 2015;39:303-13.
15. Wren SM, Balch CM, Doherty GM, Finlayson SR, Kauffman GL, Melina R, et al. Academic advancement in global surgery: appointment, promotion, and tenure recommendations from the American Surgical Association Working Group on Global Surgery. *Ann Surg.* 2020;271:279-82.

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